DIGI HE

DEVELOPING A HIGH PERFORMANCE DIGITAL EDUCATION ECOSYSTEM

INSTITUTIONAL SELF-ASSESSMENT INSTRUMENTS

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1 Executive summary

This report presents a review of 20 instruments from around the globe designed for self-assessment of digitally enhanced learning and teaching (DELT) at higher education institutions.

The report responds to an increased strategic focus on DELT across most European universities, which is also reflected in many national and European policies. In September 2020, the European Commission launched the new "Digital Education Action Plan" (2021–2027) with a major strategic priority of "fostering the development of a high-performing digital education ecosystem" (2020, p. 10).

Set against this priority and growing strategic interest from universities, the report should be of immediate interest to higher education institutions, but also to policy makers, developers of instruments, and generally, to all those who seek information on such instruments. It offers a number of insightful observations concerning their use (or non-use) by institutions for promoting both quality enhancement and digital capacity development.

While the instruments were often designed for different purposes and for different target audiences or stakeholders, many are suitable for multiple uses. Some of the instruments are more detailed, comprehensive and multi-layered than others, and therefore better suited to fostering an institution-wide digital education ecosystem. They could be used to assess maturity and current performance, foster digital capability and support institutional leaders in reflecting on future plans and developments. Some arise from the work of professional bodies, whereas others have a commercial subscription model, which has a bearing on both their sustainability and the nature of their supporting communities.

Importantly, the review of instruments underscores the role of local institutional contexts in the selection of the most appropriate instrument(s) for the intended purpose. Accordingly, no one instrument stands out as clearly superior to others, as arguably the real value of the instrument depends on the purpose and how it is implemented by the institution. In this regard, the consortium saw it as a shortcoming that few of the instruments acknowledge or seek to explicitly align with existing forms of institutional evaluation. Another key lesson is that institutions cannot just take one of these instruments off the shelf. Rather, searching for one all-encompassing instrument for DELT reflection, self-assessment and capability development would require what Paul Bacsich describes "as a 'pick n mix' approach to institutional benchmarking for eLearning" (Bacsich, 2005b). This enables the institutions to use and repurpose a range of existing instruments to engage in rich conversations, ask the right questions, identify gaps and areas for development, and collect and assess relevant data against key performance indicators as part of a wider institutional commitment to quality enhancement.

Of course, it follows that the major benefits of self-assessment depend on what actions arise, and closing this loop remains a real challenge for many institutions. In this respect, DELT self-assessment should not be viewed as a one-off activity, but rather a process of continuous development infused throughout the institutional culture. At the same time, the report concludes that such a culture may depend on fostering a wider digital education ecosystem where European educators can share their lessons and experiences, and more specifically support one another in adopting an ethos of critical self-assessment to drive and shape digital transformation. Beyond the focus on technical and structural transformation, it is therefore important to consider how to involve members across the entire higher education institution, (i.e., students and staff, the leadership, and external stakeholders). All of them have a part to play in the actual change processes at the institution, as well as in the use of these instruments and their results.

This report has been developed under the Erasmus+ co-funded DIGI-HE project, led by the European University Association (EUA) in partnership with four universities, with the aim of supporting higher education institutions to engage in self-review to develop and enhance their strategic approaches to digitalisation.

2 Introduction

The use of DELT at European higher education institutions has been increasing and there are many examples of good practice. However, at most institutions, a systematic adoption and mainstreaming of DELT is still on the way. Institutional leadership confirms the value of DELT, particularly in light of the response to the Covid-19 pandemic, yet many challenges remain in developing and implementing strategies that harness its potential. Institutional leadership perceives the difficulty to devise a concerted approach for DELT for the entire institution as one of the top challenges, right after lack of staff resources and of external funding opportunities.[1]

Evidently, holistic institutional approaches to digitalisation are required in order to ensure the development of DELT. This is also emphasised at policy level, for example, in the "Digital Education Action Plan" 2021 -2027 (European Commission, 2020) which sets the goal of developing a high-performing digital education ecosystem.

> Running from January 2020 to December 2022, the project consortium consists of the European University Association (EUA), Dublin City University (DCU- Ireland), Duale Hochschule Baden-Württemberg (DHBW- Germany), Vytautas Magnus University (VMU- Lithuania) and the University of Jyväskylä (JYU-Finland).

This is a call to the higher education sector, as such concepts cannot just be imported. Arguably, leadership and management models for digital transformation borrowed from business sectors offer lessons, but do not provide a good fit: They serve different purposes and have to be adapted to the egalitarian and collegial culture of universities. In addition, concepts of academic self-administration and autonomy differ considerably between individual higher education institutions and systems across Europe. Moreover, while there are many opportunities for peer exchange on the pedagogical and technical aspects of DELT, this is less frequently the case for aspects of leadership, governance, administration and management.

Despite these challenges and differences, in view of the increasing strategic focus on DELT, all higher education institutions have to consider many of the same key issues, including: strategy and policy development, investment and maintenance of digital infrastructure, capacity and professional development of staff, along with the provision of learning support services for students. To date, evidence suggests that much provision for digitalisation has occurred through experimental, bottom-up developments, but often in islands of innovation. While there is a trend towards more dedicated strategies and centralised services, the question remains: What does DELT look like from an institution-wide perspective when successfully implemented in a mature way?

To answer this question and tackle at least some of the challenges of digitalisation, DIGI-HE, an Erasmus+ co-funded project, was launched with the goal of stimulating reflection and exchange on the strategic development of DELT among European higher education institutions. For this purpose, the project originally intended to develop a self-assessment tool: Higher education institutions would engage in self-review to enhance their strategic approaches to digitalisation in the context of teaching, learning and assessment. A related intention was to use this tool as a platform for institutional benchmarking and knowledge exchange. The initiative hoped to build on lessons learnt from the European Commission's Self-reflection on Effective Learning by the use of Innovative Education Technologies (SELFIE) tool launched in 2018 for schools which has a strong basis in research and was developed based on the "European Framework for Digitally-Competent Educational Organisations" (Kampylis et al., 2015).

1 Digitally enhanced learning and teaching at European higher education institutions, 2020, based on survey responses of 368 higher education institutions from 48 European countries.

While benchmarking tools for DELT are not new, and the project team was already aware of a number of existing ones, none of them appeared to be widely used in Europe or entirely fit for the intended purpose. A more thorough review of existing instruments for DELT development was expected to help confirm this assumption and provide a firmer basis anchored in research for the next phase of the project. As an outcome of this review, the project decided to change its approach: Desk research found an unexpected wealth of existing instruments, with more instruments likely to emerge due to the emphasis on DELT during the Covid-19 pandemic. Their analysis confirmed that they respond to diverse needs, but also that they tend to present some common challenges, among them the need to address a considerable number of users.

This, and the results from the review of the individual instruments, led to the decision not to develop yet another tool, but rather to contribute to their use. The results of this review are shared in this report.

The report is broken into six sections:

- Section 1 – Review methodology
- Section 2 – Description of instruments
- Section 3 – Analysis of instruments
- Section 4 – Key strengths and limitations
- Section 5 – Advice and guidance for higher education institutions

The final section, Appendix 1, provides the full inventory of the 20 different instruments based on a common template. This information includes who developed the instrument, launch date, the intended target group, examples of use, underpinning theoretical assumptions, and where to locate the instrument. The project aims to update this inventory on a regular basis by creating a dedicated webpage on EUA's website, to help institutions locate instruments relevant to their contexts and for their own purposes. Also, further instruments may be added to the inventory if they offer something new or different from those already available, and accordingly suggestions and contributions from other educators are welcome.

3 Review methodology

Initially, between March and April 2020, the project team sought to identify as many relevant self-assessment instruments as possible. This desk research phase drew on the existing knowledge of the project team and a search of both published and grey literature using relevant keywords. Three publications provided a useful synthesis of existing instruments designed specifically to promote quality in online distance learning contexts (Ossiannilsson, et al., 2015; Uvalić-Trumbić & Daniel, 2015; Esfijani, 2018). Several other instruments were located through relevant professional bodies, namely the Australasian Council on Open, Distance and e-Learning (ACODE), the European Association of Distance Teaching Universities (EADTU) and the Online Learning Consortium (OLC), and some through government funded agencies, namely the European Association for Quality Assurance (ENQA), the Joint Information Systems Committee (JISC) and Quality and Qualifications Ireland (QQI).

A common template was developed to collect relevant information about each instrument. The template was initially piloted by the project team based on a smaller sample of instruments chosen to test a variety of different formats, and then revised based on feedback. A Google form designed around the template was created to manage the data collection and analysis of each instrument. Importantly, to enhance the reliability and validity of the review process each instrument was independently reviewed between May and September 2020 by two members of the project team. The desk research for the present report was led by Vytautas Magnus University (VMU) and EUA, with all other partners contributing to the reviews and the analysis. Finally, a further peer review of the analysis and key observations arising from the desk research was undertaken between October and November 2020 by two members of the project team from Dublin City University (DCU) and Duale Hochschule Baden-Wurttemberg (DHBW).

Overall, around 30 instruments were found and reviewed, but some were not included in the further analysis as they were originally designed primarily for an independent external reviewer to undertake an assessment on the state of DELT in the institution. Supporting external review was not the intention of this project. While three instruments specifically designed for the schooling sector in Finland were included in the initial longlist (Opeka, Oppika and Ropeka), they were later left out of the final sample as a decision was made to just focus on higher education.

Finally, 20 instruments were selected that directly focused on DELT development for higher education from a critical self-assessment perspective. This included SELFIE for useful comparative purposes.

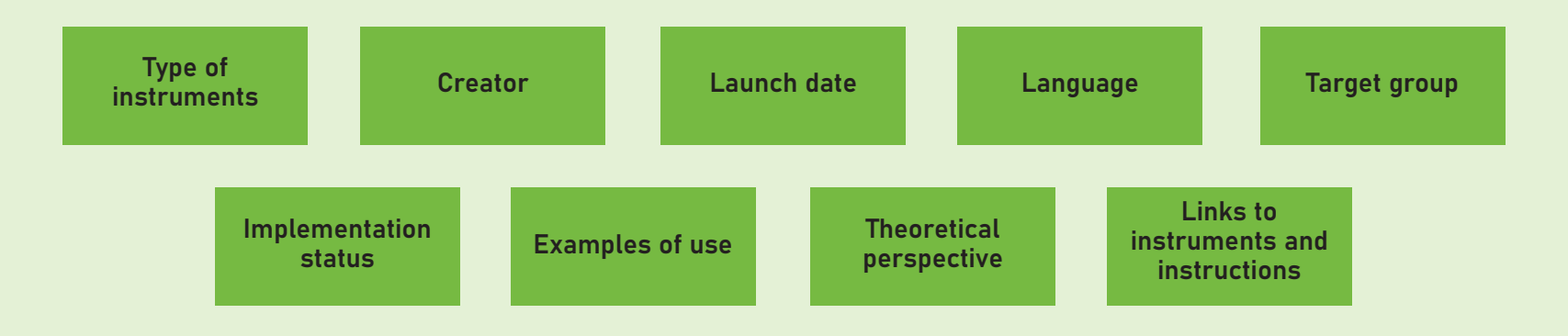

Figure 1 *Review template categories*

4 Analysis of instruments

This section provides a more detailed analysis of the instruments based on the information gathered under each section of the review template.

4.1. Overview and guiding observations

The 20 instruments all share the intent of supporting the development of DELT, though in different ways: Some were designed as assessment tools (n=3) that can be completed in order to collate a response, obtain a score or measure their institutional performance, whereas others are more like frameworks (n=7), whose main purpose is to define some principles, set standards or benchmarks, and provide guidance. However, there was a certain amount of overlap between the two categories, with several tools (n=10) being based on a concrete framework and several frameworks being accompanied by a tool, sometimes available as a purchasable service. Table 1 indicates the category that best fits the description of each instrument.

One early observation from the categorisation of instruments is that most have been crafted with much knowledge, expertise and commitment. They seem to respond to concrete development challenges that universities face, and thus serve a purpose. From this perspective, they were found to be useful in identifying strengths, weaknesses, opportunities and challenges (SWOC), but usually not beyond. The instruments tend to provide little to no guidance on how to act upon these results.

The project team, judging from experience in institutional change and transformation, sees this as an essential point: The effective use of such instruments would depend to a large extent on critical reflection, which beyond merely identifying current strengths and shortcomings, would depend on active dialogue and genuine collaboration among institutional stakeholders, including senior leadership, those in middle management roles, administrative staff, faculty instructors, students, and possibly also with external groups. While using a self-assessment instrument can play this role within institutions, obviously it should also facilitate this reflection among them. But actual evidence of frequent use of the instruments or of a supporting community is limited, at least outside a commercial client-customer relationship, which some of the instruments offer.

Tool only	Framework only	Combination of tool and framework
SELFIE	DigCompOrg	DigCompEdu
Leibniz Benchmarking Tool	JISC- Digitally Capable Organisation	JISC (tools available on project website as a commercial service)
HEInnovate	QQI Blended Learning Guidelines	UNESCO Blended Learning Assessment Tool
	European Maturity Model for Blended Education (EMBED)	E-xcellence: Quality Assessment for E-learning: a Benchmarking Approach
	ENQA: Quality Assurance of E-learning Provision	OLC Quality Scorecard Suite
	National Quality Standards for Online Education (NSQ)	Technology Enhanced Learning Accreditation Standards (TELAS)
	3E Framework	ACODE TEL Benchmarks
		Quality Matters (tool is fee-paying but there is an accessible version of the framework)
		Commonwealth of Learning (CoL) Benchmarking Toolkit for Technology-Enabled Learning
		HolonIQ Digital Capability Framework

Table 1 Classification of instruments by type

Another observation is that while many of the instruments have similarities, they are not mutually exclusive, and in some cases could actually be used to complement each other. Again, none of the instruments purposely enable or encourage such eclectic use.

4.2. Type of evaluation

Over half of the instruments reviewed are for internal self-evaluation purposes, and just under half are used for a combination of internal self-evaluation and external review (see Table 2). Self-evaluation instruments usually support their users in taking stock of their main areas of strength and weakness with a view to identifying tracks for optimisation or change.

4.3. Target audience

While most of the instruments in the inventory target higher education due to the nature of the project, some address education institutions in general, including schools and vocational education and training. As SELFIE, a tool targeting schools, contributed to inspiring the project, it was decided to include this initiative in the inventory for comparative purposes. In terms of the actual users of the instruments, there is wide variety, including educators, students, school and university leaders, and governmental bodies - in short, those with responsibility for developing digital capability, instructional designers, administrators, policy makers and quality assurance agencies.

4.4. Primary purpose

When choosing an instrument, it is important to consider what it was primarily developed for and how it might be applied to your own institution.

The majority of instruments address DELT in quite some breadth, including digital capabilities and digital environments in a variety of contexts and delivery modes. This suggests that there is more interest in an inclusive and encompassing approach when it comes to assessing DELT initiatives. Nonetheless, a few instruments focus on specific delivery modes, namely blended learning or online learning, or on particular challenges that institutions may want to address, such as quality assurance, the skills of educators and students, or more specific goals or missions, such as entrepreneurial and innovative competences.

Some of the instruments focus more on the micro-level with an emphasis on the individual course design. By contrast, the ACODE Benchmarks and UNESCO Blended Learning Self-Assessment Tool aim to provide more of a high-level macro analysis of the current state of DELT in the institution. A handful of instruments, such as the EMBED framework, offer a multi-layered approach, which provides a means to assess and reflect on micro-level (individuals courses) through to macro-level dimensions (whole programmes) right up to institutional strategy and policy. In a similar vein, the QQI Guidelines for Blended Learning address three different contexts: the organisational, the programme and the learner experience.

Internal self-evaluation	Combination of both
ACODE Benchmarks	DigCompEdu
SELFIE	QQI Blended Learning Guidelines
HEInnovate	E-xcellence Quality Assessment for E-learning: a Benchmarking Approach (third edition)
JISC Digitally-Capable Organisation	ENQA Considerations for Quality Assurance of E-learning Provision
EMBED framework	OLC Quality Scorecard Suite
UNESCO Blended Learning Self-Assessment Tool	TELAS
HEInnovate	Quality Matters
DigCompOrg	HolonIQ Digital Capability Framework
National Quality Standards for Online Education	E-learning Maturity Model (eMM)
Leibniz Benchmarking Tool	
COL Benchmarking Toolkit for Technology-Enabled Learning	

Table 2 Classification of instruments by purpose

4.5. Key themes

The instruments cover a wide range of key themes, with the most common being:

- policy and governance, including strategy, leadership, vision and philosophy, digital transformation, organisational digital culture, administration, legal framework;
- financing and funding, including sustainability;
- IT infrastructure including systems, platforms, tools and their application, along with digital resources;
- course, programme and curriculum design, including assessment practices;
- professional development, digital skills and staff support;
- student training, development and support, including digital identity and well-being, digital citizenship, and integrity;
- accessibility and usability of digitally enhanced learning resources and environments;
- collaboration and networking;
- research and innovation;
- quality management;
- measurement of Impact,

These key themes do not feature in every instrument. However, a significant amount of overlap was observed among instruments in terms of the key themes. For example, strategy, governance, infrastructure and resources are addressed in most instruments, while staff and student support, curriculum and assessment are in almost half.

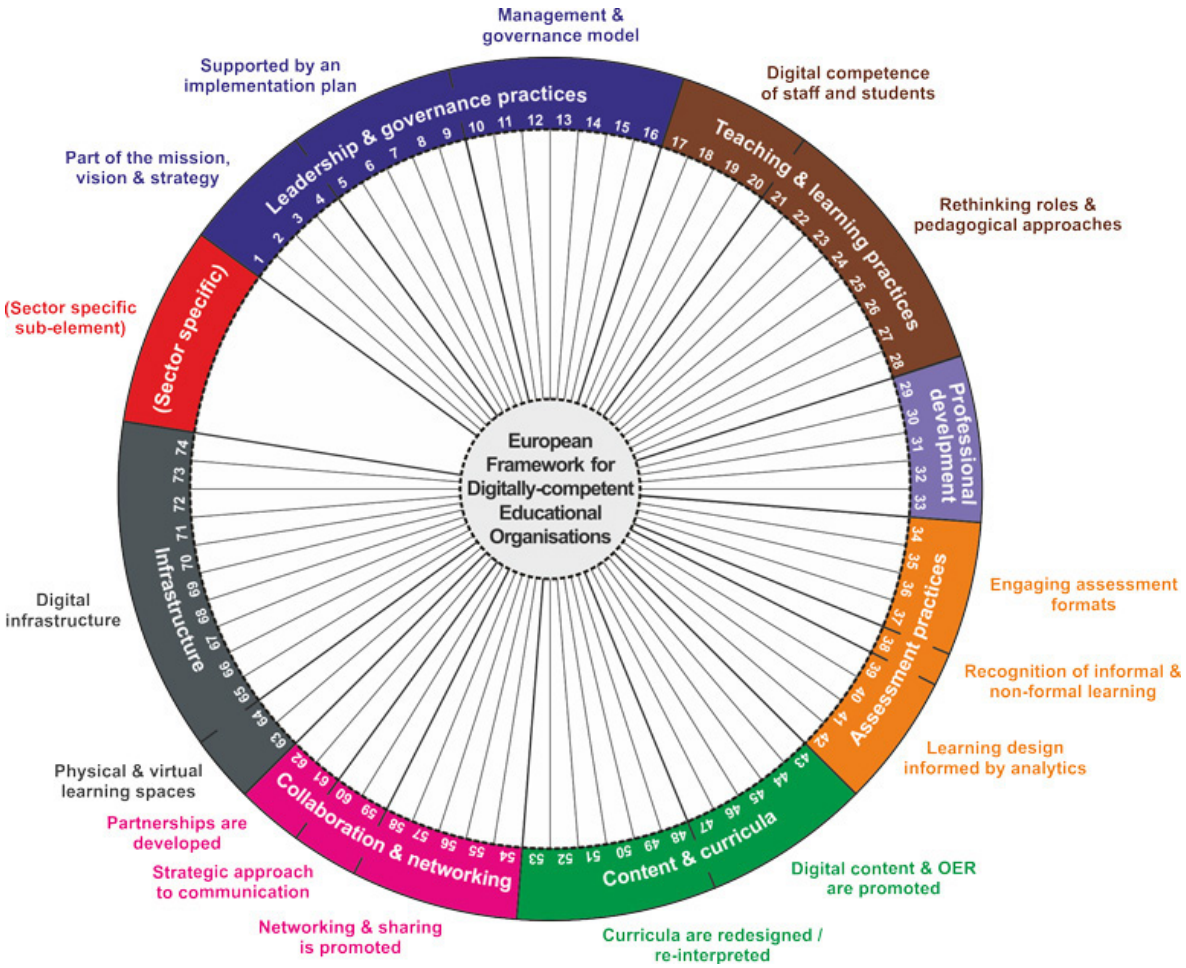

Figure 2 The different elements of DigCompOrg framework

Leadership and organisational culture as key themes run through many of the instruments, but the Commonwealth of Learning (CoL) Benchmarking Toolkit for Technology Enabled Learning is notable as it provides separate and quite detailed benchmarks to each of them. Organisational culture also permeates through JISC's model of the digitally capable organisation. Leadership is one of the key themes included in SELFIE and DigCompOrg (Figure 2) along with the value of collaboration and networking, with the latter not as obvious in other instruments designed for higher education. With the exception of HEInnovate, few of the instruments have explicit key themes that self-assess the wider research and innovation culture supporting DELT, which could be seen as yet another important gap.

4.6. Implementation

Another shortcoming is that most instruments lack sufficient information on how to successfully implement them, as well as provision for a follow-up action plan. The inclusion of a template for this plan helps to close the loop of self-assessment and most of the instruments fall short in this area. After all, self-reflection by itself without any commitment to follow-up action limits the value of the exercise, and potentially the opportunities to act on the findings to make institutional improvements.

SELFIE, quite an exception, provides such a template as well as a comprehensive set of guidelines on how to best implement the instrument within an institution, with case studies. HEInnovate also offers a comprehensive training workshop on how it can be used in a higher education institution and E-xcellence Quality Assessment for E-Learning: a Benchmarking Approach provides a comprehensive manual. Unlike most of the other instruments, SELFIE also makes explicit provision for customisation and inclusion of additional sections relevant to the institutional context. It is also noteworthy that E-xcellence acknowledges, and to some extent aligns, with the ENQA Considerations for Quality Assurance of E-learning Provision, which are included in this inventory. Moreover, the E-xcellence Quality Assessment for E-Learning: a Benchmarking Approach's website is notable for its links to other relevant international publications such as the report by Mathes (2019), which provides a synthesis of recent literature from a global perspective on issues of quality in DELT.

Some of the instruments with supporting communities offer suggestions for conducting the self-assessment; but this information is not always explicit in the instrument itself or readily available on the relevant website. In some cases, such as Quality Matters, the community engagement feature is only available when higher education institutions subscribe to the service. What this means is that the value of the supporting community is difficult to assess until the institution joins or becomes a member of the host organisation.

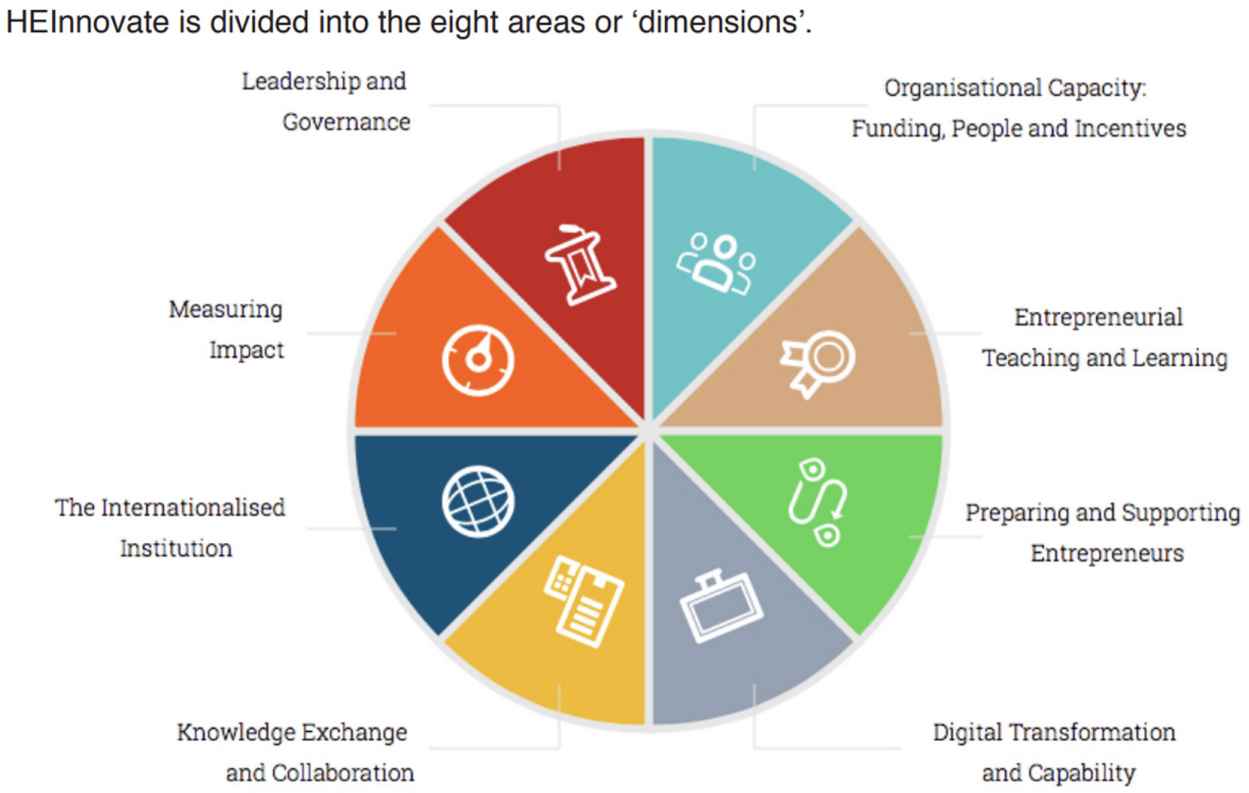

Figure 3 *The eight dimensions of HEInnovate*

One final point concerning the actual implementation and change to be achieved: Any consideration of impact or wider return on investment is quite rare among all of the instruments, with the exception of HEInnovate (Figure 3); and perhaps reflects the fact that many institutions are currently focused on policy, infrastructure and professional development, among other things, and have yet to shift their attention to this issue. The question of impact, however, should be central to the self-assessment of DELT and not seen as something that comes later in the process.

4.7 Self-assessment rubrics

Most of the instruments offer a scale to help plot, measure or assess the current state of development. However, the scales vary greatly both in terms of nomenclature and what they endeavour to measure, ranging from simple three-point continuums, such as in the 3E Framework with a focus on the course level, to a 10-point scale for the whole institution as offered by the Leibniz benchmarks. In the case of the 3E Framework, as shown in Figure 4, the three different levels from "Enhance-Extend-Empower" focus very much on the individual course in the context of specific learning activities taking place within the virtual learning environment (VLE).

In contrast, the names assigned to each of the three self-assessment levels in the European Maturity Model for Blended Education (EMBED) vary depending on the particular focus. Another important distinction is that the EMBED framework offers three different levels across three different layers ranging from the "course" layer to "programme" layer and to "institution" at large. In this respect, three action levels are identified in the model involving different actors or stakeholders: micro, meso and macro. Figure 5 provides an example of the self-assessment scale for the meso or programme layer for EMBED in response to a question about overall coherence.

	Enhance	Extend	Empower
LTA Activity	Adopting technology in simple and effective ways to actively support students and increase their activity and self-responsibility	Further use of technology that facilitates key aspects of students' individual and collaborative learning and assessment through increasing their choice and control	Developed use of technology that requires higher order individual and collaborative learning that reflects how knowledge is created and used in the professional environment
Essays	Create a series of short weekly announcements (e.g. using the VLE pop-up announcement tool) that tell students where you expect them to be in the essay research/writing process by the end of that week	Create a short 4 or 5 item self-test quiz on a particular topic that 'releases' an example of a good essay on successful completion Provide online spaces for formative tutor and peer review of drafts	Have students engage critically and directly with the public knowledge base in their area by having them write accurate scholarly pieces for online resources like Wikipedia
Groupwork and groupwork management	Make the group working more manageable and 'visible' by having each group post a weekly update of progress to a private discussion board visible to the group and tutor	Consider the use of wikis for the authoring of group reports to aid version control, provide a space for formative feedback and to see the pattern of individual contributions	Use wikis and other online spaces to allow peer review and assessment of group reports (e.g. reviewing a report online, then completing a peer review survey in the VLE)

Figure 4 *Example of three different levels for 3E Framework*

Programme coherence

The vertical (course-programme) and horizontal alignment (between courses) of a blended programme.

Level 1 **Ad hoc**	Level 2 **Design-based**	Level 3 **Programme cycle**
No deliberate consideration for the horizontal and vertical alignment in a blended programme design.	Deliberate consideration for the horizontal and vertical alignment in the blended programme design, based on a shared vision, and a design method or principles.	Deliberate consideration for the horizontal and vertical alignment in the blended programme design, based on a shared vision on blended learning, and a design method or principles. Continuous quality improvement is implemented in order to enhance a programme in an iterative manner.

Figure 5 *Example of three different EMBED levels for programme layer*

Some of the instruments offer more complex assessments: For example, under seven key elements the DigCompOrg framework unpacked 15 sub-elements with a total of 74 descriptors. In contrast, the ACODE Benchmarks provide a Scoping Statement, Good Practice Statement, Performance Indicators and then Performance Measures on a five-point scale. In some cases, an important distinction is made between whether something exists, such as a plan, and whether this aligns or has actually been implemented in practice, as Figure 6 illustrates.

The ACODE Benchmarks come with a downloadable spreadsheet to help manage data collection. The UNESCO Blended Learning Self-Assessment Tool, which is less complex and based on a four-point scale ("under consideration", "applying/emerging", "infusing" to "transforming"), is a dynamic online tool for recording institutional responses. This tool then produces an institutional report that includes a radar or spider diagram to visually represent each area of self-assessment, as presented in Figure 7.

PI 2. ***Specific plans relating to the use of technology enhanced learning are aligned with the institution's strategic directions and operational plans.***

	Specific plans exist		Plans are aligned	
1		No specific plans		Not aligned to institution strategic and operational plans
2		Immature plans	X	Limited alignment with either institution strategic or operational plans
3		Some specific plans		Moderate alignment with either institution strategic and operational plans
4	X	Numerous specific plans		Moderate alignment with both institution strategic and operational plans
5		Comprehensive suite of plans		Considerable alignment with both institution strategic and operational plans

Overall rating	1		2		3	X	4		5	

Indicate where you believe you rate above.

Figure 6 *Example of self-assessment scale in ACODE Benchmarks*

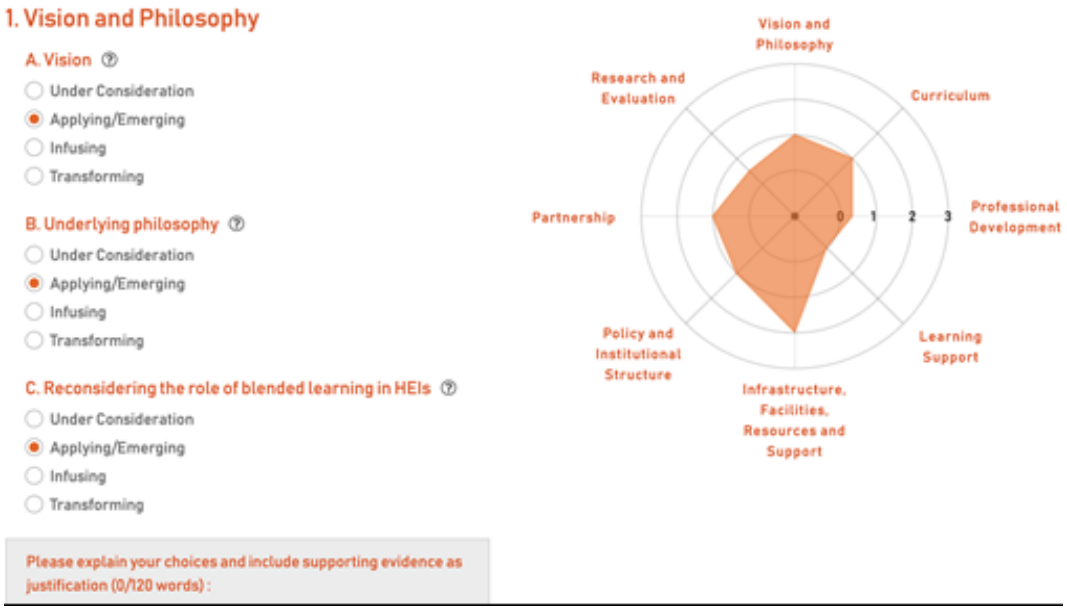

Figure 7 *Example of UNESCO Blended Learning Self-Assessment Tool*

This visual representation of the findings (Figure 7) is similar to the radar diagram produced by the CoL Benchmarking Toolkit for Technology-Enabled Learning developed (Figure 8), except the latter is automatically generated by a spreadsheet that can be downloaded for the self-assessment.

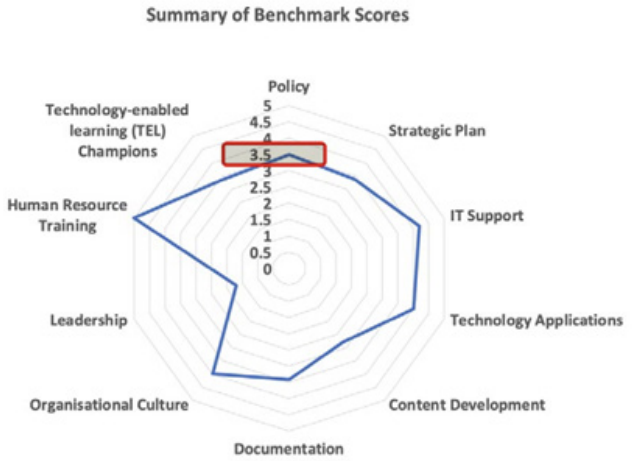

Figure 8 *Example of radar diagram CoL Benchmarking Toolkit for Technology-Enabled Learning*

The design of the instruments is not always open in the public domain, particularly when accessible through a paid membership or subscription model, such as Quality Matters and the OLC Quality Scorecard. However, the desk research has shown that the two aforementioned instruments are supported by dedicated online platforms, with Quality Matters providing its own technical system specifically designed for facilitating peer review of course offerings. The target audience was an important aspect in how each instrument was designed to assess the respective areas. For example, the Quality Matters matrix is focused on the course design level, whereas the OLC Quality Scorecard has a wider institutional emphasis, which impacts what is actually measured.

ONLINE LEARNING ENVIRONMENT DESIGN

PERFORMANCE CRITERIA	SUCCESS INDICATORS	MEASURE OF PERFORMANCE			
STANDARD 1: The online learning environment design supports a positive learner experience.					
1.1. The online learning environment is inclusive.	1.1.1. Language used is consistently appropriate and inclusive (including consistent tone, voice, person).	Yes	Yes But	No But	No
	1.1.2. The online learning environment contains evidence that diverse perspectives are respected.	Yes	Yes But	No But	No
	OVERALL	Yes	Yes But	No But	No
1.2. The online learning environment functions across devices and platforms.	1.2.1. The online learning environment is responsive across different contemporary devices (e.g. screen size adjusting automatically).	Yes	Yes But	No But	No
	1.2.2. The online learning environment and integrated technology are compatible across multiple plat forms and operating systems.	Yes	Yes But	No But	No
	1.2.3. The online learning environment and integrated technology are compatible with contemporary browsers.	Yes	Yes But	No But	No
	OVERALL	Yes	Yes But	No But	No
1.3. Online learning environment meets appropriate accessibility standards.	1.3.1. Site, content and activities meet a contemporary set of accessibility standards/guidelines (e.g. accessible font, contrasting colour).	Yes	Yes But	No But	No
	1.3.2. External tools and applications adhere to accessibility standards (e.g. Turnitin, VoiceThread, Echo360, SPSS, Padlet).	Yes	Yes But	No But	No
	1.3.3. Files are appropriately optimised for screen readers, consistently named, then labelled by type and size.	Yes	Yes But	No But	No
	1.3.4. Alternate formats are made available for multimedia (e.g. images and alternate texts, subtitling for video or audio, transcripts for video and audio).	Yes	Yes But	No But	No
	OVERALL	Yes	Yes But	No But	No
1.4. Learners have opportunities to provide feedback.	1.4.1. Learners have opportunities to provide immediate feedback (e.g. thumbs up/down, stars, flagging).	Yes	Yes But	No But	No
	1.4.2. Learners have opportunities to provide feedback at different points in time (e.g. surveys, polls, signposting).	Yes	Yes But	No But	No
	1.4.3. Learners are informed about how their feedback is going to be collected and used.	Yes	Yes But	No But	No
	OVERALL	Yes	Yes But	No But	No

Figure 9 *Example of TELAS framework*

This point of distinction is important to note in terms of the Australasian Society for Computers in Learning in Tertiary Education's (ASCILITE) Technology Enhanced Learning Accreditation Standards (TELAS) instrument where the standards and measures of performance shown in Figure 9 focus on the course or programme level rather than having any intention to assess the whole institution. At an even granular level, the DigCompEdu framework targets the development of individual competencies across six areas with 24 descriptors and is less directly relevant in terms of overall institutional self-assessment. That said, all the instruments in one way or another address the area of staff and student development and, therefore, the DigCompEdu framework and supporting tool can potentially be used in combination with other measures to provide a deeper or more complete self-assessment. This point suggests that the different instruments should not be seen as mutually exclusive, as previously indicated, and that there are merits to adopting the idea or concept of a "pick and mix" approach.

4.8. Creators, business models and communities

The instruments originate from different countries and continents, developed by three different types of actors:

- non-profit organisations and professional bodies focusing on educational innovation;
- project partnerships, usually comprising (higher) education institutions, but also organisations, and research institutes;
- governments, national agencies for education, regional education boards and independent state agencies, including the European Commission and international organisations such as the OECD, individually or as part of a partnership.

There are a couple of exceptions to these categories, as for example the 3E Framework and the eLearning Maturity Model (eMM), which arise from the work of individual academics. The Digital Capability Framework published by HolonIQ (2020) has its roots in for-profit consultancy activities. It should be noted that some of the others, as non-profit regarded instruments, may also have service charges.

A distinguishing feature across all five of these groups is the presence, or not, of a strong community of educators supporting the instruments. For example, Quality Matters, which falls into the first category, has a very strong network of members, but institutional membership requires an annual subscription fee. Similarly, institutional membership of ACODE involves a fee for a range of services that go beyond institutional benchmarking, but notably since 2014 there have been biennial inter-institutional benchmarking summits for sharing of experiences (Sankey & Padro, 2019). In contrast, there appears to be no strong supporting community associated with the UNESCO Blended Learning Self-Assessment Tool, with the assumption that institutions will largely use this tool on their own. The situation appears to be similar with CoL's Benchmarking Toolkit for Technology-Enabled Learning, although there is a comprehensive online guidebook and facilitated MOOC available to go alongside the benchmarks. In the case of the QQI Blended Learning Guidelines developed by the national quality agency in Ireland, there is no evidence of support or any sense of community to assist with their implementation. This might explain why we were able to find limited evidence of the implementation of such standalone instruments by institutions when analysing the literature and relevant websites.

4.9. Launch date and history

Most instruments are quite recent, with the oldest launched in 2003 and the most recent launched in 2020. However, there is evidence in the literature dating back before this period that a DELT benchmarking project was first underway in the UK as early as 2001. An archive documenting this initiative, including several presentations (Bacsich, 2005a) and a comprehensive literature review on the theory of benchmarking (Bacsich, 2005b) is still available on the project website. At the time there appears to have been a preference towards a "pick and mix" approach.

Several of the less recent instruments have been updated, with second or third editions now available. For example, the ACODE Benchmarks are now in their second edition and E-xcellence Quality Assessment for E-Learning: a Benchmarking Approach developed by EADTU has gone through two revisions since being first launched in 2009. The majority of instruments have been implemented, which was generally evident based on information and/or testimonials on their websites. In some cases, the review team's individual members' prior acquaintance with the instruments was the main source of further information. However, for about one third, there was no way of knowing or verifying whether they have been used or applied, let alone successfully implemented by higher education institutions.

4.10. Outreach, language and contextual relevance

The instruments can, technically speaking, be exploited by a wide audience, as all of them are online and most of them are free of charge, at least at an initial stage. Furthermore, the vast majority of instruments are available in English. However, whether an educator or higher education institution would want to use an instrument from a different country or continent is another question, as it may not encapsulate local cultural or contextual differences. For example, the National Standards for Quality Online Programs (NSQ), supported by standards for both teaching and courses, have a United States target audience, with some of the language and terminology less appropriate in a European context. Several instruments developed in English-speaking countries, namely Ireland, the UK, Australia and the United States, are only available in English. However, two, OLC Quality Scorecard Suite and Quality Matters, do provide certain documents in Spanish with the latter also providing some in Chinese. The Leibniz Digital Benchmarking Tool is in German. However, some of the European instruments are available in all 24 official EU languages, as well as several non-EU languages, with others being offered in several of the main European languages.

On a related note, there is a possibility that the method adopted to identify the various instruments has an inherent English language bias and for this reason potentially useful instruments may have been overlooked for inclusion in the sample.

4.11. Underlying theoretical assumptions

A stated theoretical perspective underpins just under half of the instruments in the sample, although this is often implicit, and rarely anchored in the wider literature on educational evaluation. The instruments tend to centre primarily on self-assessment of DELT, but only a few fully reflect the wider institutional perspective on evaluation. This gap is a weakness on two fronts.

Firstly, many higher education institutions, depending on the national system, are required to participate in a regular cycle of institutional evaluation for both academic programmes and the entire institution. Ideally, reflection on and self-assessment of DELT should be embedded in these evaluations rather than seen as an entirely separate activity.

Secondly, and related, an evaluation disconnected from other external quality assurance processes and requirements is likely to make it more difficult to develop and implement sustainable actions for improvement across the entire institution. The key point is that formal institutional assessments have considerably more status and place far greater onus on higher education institutions to respond to any recommendations.

That said, recent data confirm that DELT is not yet embedded everywhere in internal and external quality assurance. In addition, quality assurance approaches may not lend themselves to the purpose of strategic institutional development everywhere, which is an important topic. Many of the assessment instruments may provide a starting point for institutions that may have a host of DELT activities developed from the bottom up, but find themselves under pressure to develop a more systemic institutional approach, also in view of structures and resources, as well as leadership, coordination and collaboration across the institution.

Notwithstanding this point, the early review of the DELT benchmarking literature conducted by Bacsich (2005b) along with some of the theoretical assumptions underpinning the ACODE Benchmarks provide evidence of a deeper link to the evaluation literature. Even if this may have gotten lost and forgotten in most of the instruments reviewed, some still address this. Sankey and Padro (2019), for example, in describing the history of the ACODE Benchmarks, cite an early paper from Elmuti and Kathawala (1997) that identifies the benefits of institutional benchmarking, including:

- continuous improvement;
- determining areas for development or growth;
- developing strategy;
- enhancing organisational learning and improving organisational sense-making;
- increasing productivity or improving the design of a product or service;
- performance assessment;
- performance improvement through recalibration or setting of goals.

They also draw on Bhutta and Huq (1999) to acknowledge that there are many different models and approaches to benchmarking, including:

- performance benchmarking (the comparison of performance measures to determine how an organisation compares to others);
- process benchmarking (comparing methods and processes in an effort to improve an organisation's own processes);
- strategic benchmarking (when changing an organisation's strategic direction and the comparison with the competition is pursued in terms of strategy);
- internal benchmarking (comparisons made between an organisation's own departments/divisions);
- competitive benchmarking (performed against "best" competition to compare performance and results);
- functional benchmarking (compare the technology/process in one's own industry or technological area to become the best in that technology/process);
- generic benchmarking (comparison of processes against best process operators regardless of industry).

The value of collaborative benchmarking across institutions appears to have been an important feature in the original design and development of the ACODE Benchmarks (Sankey & Padro, 2019). While the promotion of collaboration between internal stakeholders is common to most instruments, although not essential, Quality Matters provides an example with a particular focus on the value of

collegial peer review as a vehicle for sharing and distributing ownership for quality across the institution in order to support a quality culture of continuous self-improvement.

This approach contrasts with instruments that tend to have a shorter-term focus on providing a snapshot of the current situation from an institution-wide perspective, without necessarily addressing deeper issues of culture and leadership. In this respect, the handful of instruments designed also for use by external panels to make institutional assessments tend to reflect a very different philosophy and theoretical approach towards evaluation and ongoing development. That said, external review is sometimes required of higher education institutions for accreditation and quality assurance purposes. However, it does not have to be mutually exclusive from collaborative internal self-assessment using relevant instruments as the two approaches can be complementary. The key point is that the review of the different instruments underscores the importance of collaboration both internally within higher education institutions and externally with other stakeholders in order to support the development of high performing digital education ecosystems.

Two related points are noteworthy from this wider system or ecological perspective. Firstly, the concept of maturity, which features in a number of the instruments, is potentially problematic if narrowly interpreted as DELT being static or linear in terms of progression, rather than being lumpy and constantly evolving or developing. It is important to understand that what is deemed a mature state today is likely to look quite different in the future, with the emergence of new technologies and an evolving digital education ecology. Indeed, whole new areas of development may emerge or require greater attention in the future, such as micro-credentials and the use of artificial intelligence in education. Accordingly, maturity relates more to an institution's capacity to respond to this changing ecology, which a single instrument approach to self-assessment may not fully encapsulate. In a similar vein, reflection and self-assessment for DELT, which is not anchored in a wider dialogical community of practice, may limit the potential for future proofing, especially in such uncertain and unpredictable times.

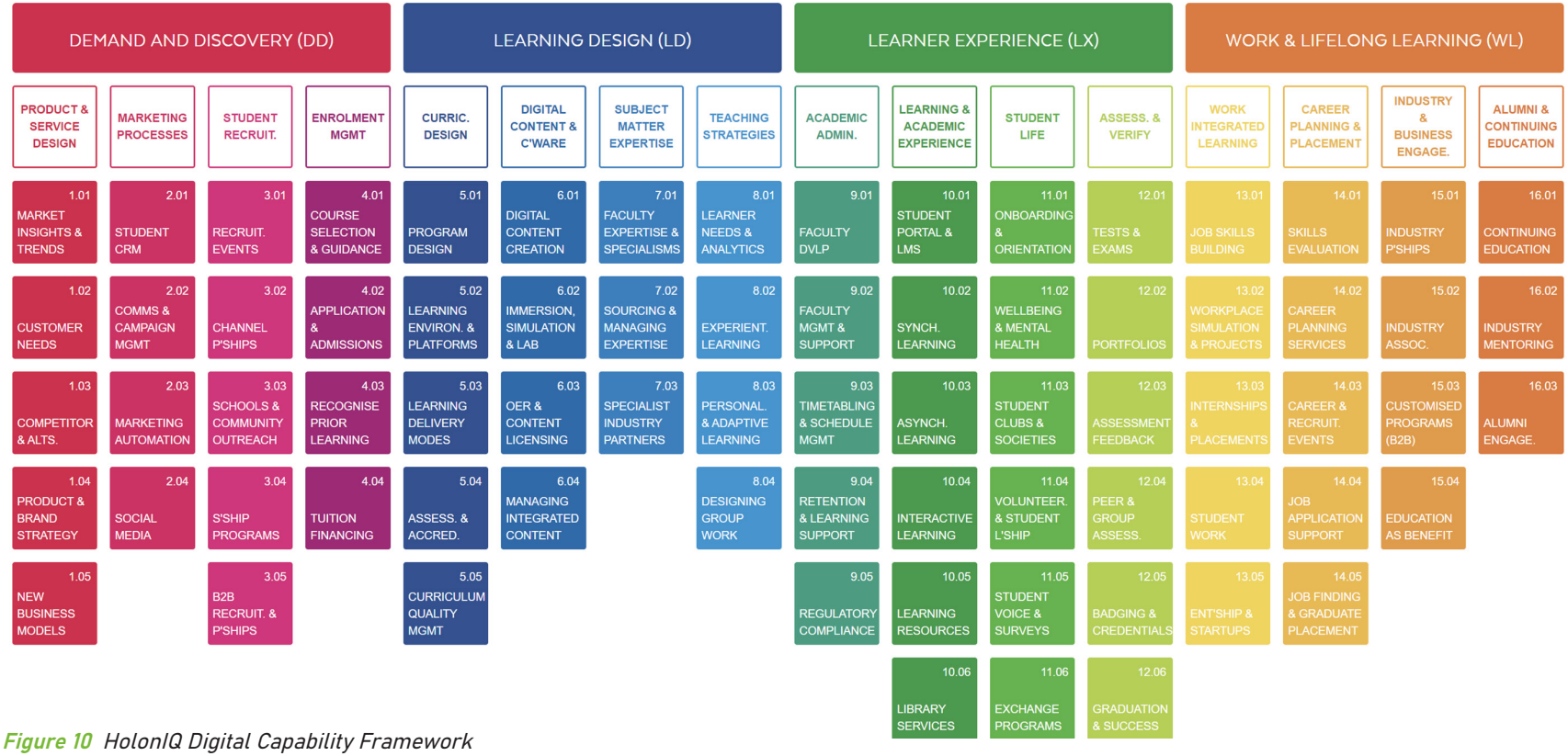

Figure 10 *HolonIQ Digital Capability Framework*

Secondly, building on an earlier point, an overly narrow focus on DELT may not take sufficient account of wider changes to the higher education ecology, and the need for a more integrative or overarching institutional strategy or response. In this respect, instruments such as HEInnovate, DigCompOrg and the HolonIQ Digital Capability Framework, as shown in Figure 10, were intentionally included in the inventory as they illustrate how thinking about DELT needs to be connected to and part of a wider understanding of what it requires to be a digitally capable organisation.

Lastly, for most of those instruments that are not based on a specific theory or perspective, literature reviews, research and stakeholder consultations were usually undertaken in order to ensure that the methodology behind the instrument was robust and trustworthy. This is certainly the case in the original development of SELFIE and other instruments supported by the European Commission, such as the DigCompEdu and DigCompOrg frameworks.

5 Key strengths and limitations

Based on the analysis of this discussion, this section provides an overall summary of the main strengths and limitations of the reviewed instruments.

5.1. Strengths

Most instruments are easily accessible, usually involving some level of free registration. However, for more advanced options, a fee is sometimes required in order to access the full version of the instrument.

By and large, the reviewers found most of the instruments useful in terms of fostering critical reflection and relatively easy and practical to implement. Indeed, most have instructions, coming in various forms such as user guides, video tutorials, manuals, or a simple explanatory section on their website, that are sufficient for people to get started. For several of the more straightforward or less multi-dimensional instruments, such as the UNESCO Blended Learning Self-Assessment Tool, detailed instructions with an underlying philosophy are probably not crucial to their high-level implementation by higher education institutions as their strength is their simplicity.

According to the majority of reviewers, the instruments are useful and relevant for their own institutions in terms of the key themes they touch upon. Related, there is significant overlap between instruments suggesting a high degree of triangulation, which is considered to be a strength: Instruments identify and address common domains and dimensions in terms of what key themes institutions should focus on. That said, some of the instruments are more comprehensive, broad and holistic in terms of the gamut of key themes they touch upon and these instruments potentially offer a richer or deeper analysis of the current state of DELT in the higher education institution; and they serve to flag a wider range of areas for improvement. Whether this is an advantage may depend on the specific needs of the user. But the review team generally found broader, more holistic approaches more appropriate, in view of the complexity that learning and teaching, as well as the digital dimension, hold for the institutions.

Overall, the vast majority of instruments are easy to understand with clear and well-explained indicators, benchmarks and key themes. However, again the more comprehensive instruments are likely to trigger and scaffold deeper reflections, with potential for more meaningful and impactful conversations between different stakeholders, and a better basis for transformative actions. Conversely, these instruments require more engagement by users and are likely to be more time-consuming to implement, so this added level of depth can be seen as both a strength and limitation.

The reviewers considered it to be a particular strength when users can customise the instruments by adding their own questions and adapting them to their own needs, but this feature is not as common as preferable given the contextual nature of higher education.

As stated earlier, almost a half of the instruments reviewed can be used for both internal and external review and this versatility is considered to be one of the key strengths. Likewise, the fact that certain instruments provide feedback in the form of a report is highly appreciated, especially those that present the results in a visual, and in an easy-to-interpret way, and allow opportunities for comparison with other institutions. This comparative feature is rare in terms of the instrument itself, but where there is a supporting community for wider sharing and reflection, this is considered a particular strength. Similarly, offering supporting materials such as case studies and other resources was underlined as being a key strength as it provides guidance in terms of next steps and the implementation of a roadmap for change. Evidence that the instrument is based on solid research is also considered to be a key asset, as this increases the level of confidence in the validity and reliability of the instrument. Another strength is evidence of regular revisions and updating of indicators, benchmarks and key themes based on users' feedback and further developments in the area. Although not everyone would agree as it may change the underlying drivers of the reflective exercise, awarding higher education institutions or particular courses with a label or badge following successful assessment might be an effective way of bringing about change.

5.2. Limitations

One of the major criticisms is that some of the instruments are too narrow, in that they focus on a specific area, such as blended learning, entrepreneurship, quality assurance, educators' skills or are only relevant for course-level. Although this is not a weakness per se, it does potentially limit the transferability of the instrument to wider institutional reflections with a diverse range of stakeholders. Likewise, certain instruments are primarily intended for a senior-level audience within and sometimes beyond the institution. Again, although this may not be a weakness, it may limit the potential to engage a wider range of stakeholders in reflective conversations for self-improvement at the micro- and meso-levels of the institution, including both educators and students, but also external stakeholders.

Having a strong and explicitly stated theoretical perspective underpinning the instrument is regarded as a major strength by the review team, especially when this is clearly anchored in contemporary literature on institutional evaluation and self-assessment. Therefore, it is no surprise that a lack thereof is regarded as an impediment or questionable aspect of the instrument in that it undermines the credibility of those instruments that fall into this category. General aesthetic, interface design and the type of dashboard presenting aggregated data should not be underestimated, as they can be confusing, too complicated or just unattractive, which may diminish the confidence in the instrument. Moreover, it was noted that a lack of regular updates or revision of instruments is a real weakness and flags the importance of considering sustainability in decisions around the use of a specific instrument.

Although it is understandable that organisations and professional bodies responsible for developing such instruments need a sustainable business model, the fact that certain instruments are inaccessible due to financial barriers requiring higher education institutions to become a member, is also considered to be a shortcoming. A paid subscription membership model limits the opportunity for an open community of educators and potentially the wider impact of the instrument.

The potential transferability of some instruments across national and wider geographical borders is also deemed to be limited in some cases due to differences in terminology and approaches to higher education.

Although most instruments are considered to be user-friendly and well-explained, some of the statements under each key theme can be quite wordy and may not be entirely relevant to all contexts. Moreover, there are often duplicate questions across different key themes and some options are on occasion misleading or left too open to interpretation. In addition, there is little guidance in terms of what, relatively speaking, constitutes low scores compared to high scores for certain instruments, leaving more scope for the inclusion of case studies to help illustrate what best practice could look like. In this respect, instruments with good practice statements and well-defined performance indicators really stand out compared to more general instruments. That said, these types of instruments are typically more complex with more sub-sections which means the self-assessment process is likely to take longer, which may be a drawback in terms of workload and ease of implementation. For example, for several instruments the requirement for individual respondents to gather evidence before being able to answer specific questions is considered to be a difficulty as it extends the process and could make it less feasible to implement, particularly if you wish to engage a diverse range of stakeholders.

Finally, perhaps the biggest challenge is that the use of such instruments will not necessarily lead to institutional change. This is a concern in particular in the case of instruments which provide no or little guidance on this issue. Although most instruments do help users identify their main strengths, limitations and areas for improvement, and provide some guidance documents for their next steps, notably few incorporate information on how to develop an action plan for what to do on completion of the reflective exercise.

This challenge underscores two crucial points. Firstly, any self-assessment of DELT needs to align with other institutional plans, changes and quality enhancement processes. Secondly, understanding how best to act on the outcome of any self-assessment is likely to benefit from engagement in a wider community of practice or peer support network to share lessons and devise a roadmap for change. Both points reiterate that in order to foster critical reflection and institutional self-assessment in the area of DELT we need to look beyond the instruments.

6 Conclusion

This report began with the question: What does DELT look like from an institution-wide perspective when successfully implemented in a mature way? This question was set in the wider context of the European Commission's new "Digital Education Action Plan" (2021–2027) and the strategic priority of "fostering the development of a high-performing digital education ecosystem" (2020, p. 10). After locating and reviewing a number of self-assessment instruments developed around the globe over the past decade or so, the answer to this question is complex. There are many different dimensions of DELT and many different ways that higher education institutions can choose to harness the potential of digitalisation to achieve their goals. Although at risk of borrowing a cliché, there is no one-size-fits-all model of DELT as institutional context is crucial. Accordingly, the report does not advocate for the use of a particular instrument even if on initial impressions they look good and appear fit for purpose; nor does the review team see much value to be gained from developing yet another instrument for the higher education sector. Indeed, the report comes to the conclusion that a dialogical, "pick and mix" approach may be more productive in terms of future efforts to support and scaffold critical self-assessments that lead to real and transformative change in higher education institutions. Such an approach recognises that the process of continuous development in DELT needs to be infused throughout institutional culture, as well as part of a wider ecosystem that promotes critical self-assessment as a shared ethos and collective responsibility of European educators.

7 Advice and guidance for higher education institutions

This section synthesises the main findings of the review of instruments by providing concrete advice and guidance for their potential at higher education institutions. More specifically, it outlines some of the key questions and considerations when choosing DELT self-assessment instruments. In broad terms there are three key considerations for institutions: (i) infrastructure, (ii) application in organisational culture, and (iii) strategy and future developments.

Key questions and considerations

Given the increased interest in DELT as a direct consequence of the Covid-19 pandemic and the likelihood of blended and hybrid learning approaches playing a much more prominent role in higher education for the foreseeable future, it may seem like the ideal time for higher education institutions to review their digitalisation policies to ensure that they are fit for purpose. However, a survey on DELT in European higher education institutions conducted as part of the wider DIGI-HE project reveals that at this stage a very small percentage of institutions have used a self-assessment or benchmarking tool to do so (Gaebel et al., 2021). Notably, when asked about their internal review practices in response to question 17, "Has your institution used any self-assessment and/or benchmarking tools for digitalisation", as shown in Figure 11, only 12% of the responding institutions affirmed that they had already used such an instrument. Out of those who had not, mixed responses were reported. For example, 45% stated that they would be interested in using a self-assessment/ benchmarking tool and 43% reported that they were either reluctant to try such a tool or they were unsure as to whether they would be interested in using one. The source of this reluctance is unclear from the survey responses.

In addition, under a third of institutions selected the use of a self-evaluation instrument as one of the top three most useful measures for improving DELT within their institution. It is likely that institutions need to be supported before embarking on such an undertaking and for this reason drawing on this review of instruments and the DIGI-HE consortium's own experience of using self-assessment instruments, the next section offers some advice and suggestions on how best to approach such an activity within institutions.

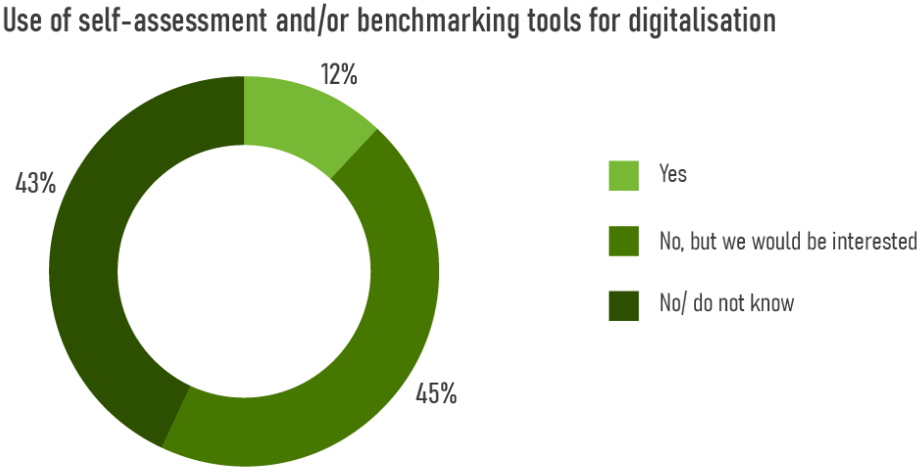

Figure 11 Survey on digitally enhanced learning and teaching in European higher education institutions n=367

Using instruments – pros and cons

There is solid evidence supporting the use of self-assessment instruments to promote a high performing digital education ecosystem. Several of the instruments reviewed in this inventory of instruments provide testimonials and case studies of users, which indicate that an institutional review through a self-assessment process is indeed a useful undertaking. When done well, this process can help to facilitate structured conversations on how to reframe the institution's strategies to harness the potential of DELT and is beneficial in terms of data and evidence collection, among other things. In particular, those instruments that provide a community around their use appear to be effective in initiating real change in the institution.

On the other hand, identifying the right instrument and learning how to use it can be overwhelming for many educators, especially when it may not fit a particular context. Moreover, some of the instruments may seem too cumbersome and time consuming if the goal is to engage a wide range of stakeholders in the process. The time required is perhaps one of the reasons why DELT self-assessment and benchmarking instruments seem to enjoy little uptake to date, with some notable exceptions in Australia and the United States. Furthermore, the move from the self-assessment findings towards concrete actions and a change process within the institution might cause challenges. As previously mentioned, exchanges with other institutions, peer support and mentoring are useful strategies to make it happen. With this last point in mind, the following questions are intended to frame these wider conversations around the best approach and instruments to adopt for institutional self-assessment.

How to select the right instrument

- What do you want to achieve? Define your reasons or drivers. Understand why you want to engage in self-assessment.
- Based on your reasons, is the instrument specifically designed for this purpose and for institutions like yours? Do you think the instrument is adaptable and applicable to your governance structure and institutional culture?
- Do the specific key themes identified in the instrument correspond to your needs? Do they address the areas you think are most important? There are many key themes that are common across the instruments, but they vary in depth and the level they address.
- Are you considering undertaking an internal or an external review? Some, but not all, instruments offer both options. External reviews are usually a purchasable service and may not help to engage your internal stakeholders in open and transparent critical reflections and self-assessments. This inventory contains instruments that serve internal only, or internal and external review.
- Do you understand the strengths and limitations of each instrument? Check the full inventory of instruments contained in the Appendix, as this provides information on the instruments that is not necessarily advertised on their websites, such as the length of the assessment process, the level of difficulty involved, the quality of the instrument and their deliverables, as well as their philosophical approach.
- What are you going to do with the findings? Be strategic about what you choose as the instrument needs to be credible but keep the "practicalities" of implementation in mind: The implementation guidelines and instructions provided for the instruments can give valuable information for the decision on whether this is the right approach for your institution. But make sure you think about how you will act on the findings before you start the process.
- Could you use a combination of instruments? You may be able to "rip and reuse" what fits your context. and adjust the instrument to your needs. Where possible, you may just use a part of the questionnaire, or one particular step. This type of a "pick and mix" approach may help to contextualise the self-assessment process to meet your institutional purpose and to promote the types of rich conversations you need to spark sustainable transformative change.
- Who should you contact? Who else has used the instrument? We strongly encourage you to reach out for support and to learn the lessons from others through a relevant professional community. This is one of the most important lessons and usually colleagues at other institutions are more than happy to share their experience.

How to use instruments within your institution

- Where do you start? Most of the instruments offer a handbook, manual or guidelines. As the instruments vary significantly, it is important to read the accompanying instructions or website descriptions to understand how they should best be used. But there is nothing better than asking someone else who has already used the instrument for advice.

- Who should own the self-assessment process within your institution? This is an important question as you need to ensure that the ownership is connected to senior leadership and decision-making structures as this will enhance the status of the exercise and how you ultimately implement any proposed actions arising from the self-assessment.

- Who do you wish to involve? It is important to think about your audience and the key stakeholders including students. The description of the chosen instrument(s) may help you to decide who is the most suitable person to lead the self-assessment process. Furthermore, although certain instruments can be used by one person, others involve building a small team, and therefore require a more long-term, coordinated commitment from the institution. In any case, in order to ensure proactive participation and buy-in for the self-assessment, but also for the later work on its results, it is useful, or even mandatory, to start early to build a community around the exercise.

- What will you do with the findings? The key challenge is how will you act on what you find to ensure the whole process was worthwhile and leads to real institutional change. In this respect, it is crucial that the findings align or can be embedded within other types of institutional self-assessments, which may have a higher profile and significance in terms of setting future strategic directions. In other words, DELT self-assessments should not be siloed from other activities and future strategic planning in your institution.

How to use instruments to benchmark and share findings

- Who will you share the findings with at your institution? You need to think about who will receive a copy of the findings and how you will present them to engage a wider community. At what fora or committees should they be discussed to ensure there is high-level engagement and agreement on proposed actions?

- Who else could serve as a benchmark? You may be able to convince a partner institution to do the exercise in parallel. While most instruments are intended for use at one individual higher education institution, this does not prevent you from reaching out to other like-minded educators in order to learn more and share experiences.

- How can you go about sharing your findings? Some instruments encourage sharing of results, or even offer anonymised benchmarking services as part of their report or “diagnosis” upon completion of your self-assessment. On the other hand, this may lose some of the context that is crucial to unpacking key lessons and interpreting similarities and differences across institutions.

- Where do you go from here? The standout lesson from this review of instruments is that self-assessment is not the end point. It should serve a purpose. In thinking about the next steps there is a great deal to gain from being part of a wider network of educators as in many respects both the source and power of continuous self-improvement in DELT can be found in these professional communities of practice.

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9 Appendix – Inventory of self-assessment instruments

This inventory provides an overview of the instruments analysed by the DIGI-HE Project Consortium. Included is a snapshot of each instrument rather than a full review, allowing readers to identify the instrument that corresponds to their needs and carry out further research in their own time. Educators are encouraged to scan through this information to compare and contrast the key strengths and limitations of each instrument. For those who wish to do further research into any of these instruments, links have been provided, where possible, as well as any freely accessible guidelines or instructions.

More detailed information about the aim and content of the instrument can be found in the description section, which includes the key themes for each instrument. To help readers determine whether an instrument is suitable for their institution, a table of strengths and limitations has been provided for each instrument based on our analysis. These views belong purely to the project consortium and are not those of the European Commission or the European University Association.

All instruments were reviewed by two different members of the consortium, and all information in the inventory has been peer-checked for quality assurance purposes. As certain instruments are updated regularly, some of the information in this inventory will become dated. Therefore, the intention is to convert the inventory into a live database on EUA's website. This will ensure that all information relating to the different instruments in the inventory is up to date and that new instruments and feedback from readers can be added. You are kindly invited to share any feedback on individual instruments, or the inventory more generally, with the project team (digihe@eua.eu) to help us enhance the value of this resource.

Australasian Council on Open, Distance and e-Learning (ACODE) Benchmarks

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Initiated by Christine Goodacre and Angela Bridgland, developed by ACODE member universities, and reviewed by enchmarking specialist Paul Bacsich	2007 with major reviews undertaken in 2014 and 2016	English	Enterprise level and institutional units, i.e. faculty responsible for the provision of leadership in technology-enhanced learning	–	Yes - received positive feedback	Self-evaluation of higher education institutions Inter-institutional activity or internal report	Templates provided to record individual and team score for each benchmark	https://www.acode.edu.au/pluginfile.php/550/mod_resource/content/8/TEL_Benchmarks.pdf https://www.acode.edu.au/ **Guidelines:** https://bit.ly/3nD5a3V

Description

The tool consists of eight benchmarks of technology-enhanced learning: *Institution-wide Policy and Governance for Technology Enhanced Learning, Planning for Institution-wide Quality Improvement for Technology Enhanced Learning, Information Technology Systems, Services, and Support for Technology Enhanced Learning, Application of Technology Enhanced Learning Services, Staff Professional Development for the Effective Use of Technology Enhanced Learning, Staff Support for the Use of Technology Enhanced Learning, Student Training for the Effective Use of Technology Enhanced Learning, and Student Support for the Use of Technology Enhanced Learning.* Each of these benchmarks includes the following components: scoping statement, good practice statement, performance indicators, performance measures (on a five-point scale), and a place to provide evidence. Each user can choose whether to do the full review, evaluating all the benchmarks and their components, or to choose several of the benchmarks that are relevant for the institution and the context. After evaluating each indicator, the reviewer has to provide a rationale and evidence to support their evaluation. The main objective of this benchmarking tool is to assist higher education institutions in delivering high-quality technology-enhanced learning experiences to students and staff. The benchmarks should be used to support a continuous process of quality improvement in technology-enhanced learning. Higher education institutions are encouraged to turn this into a collaborative exercise by sharing their results with other institutions who have also carried out an internal self-assessment using these benchmarks.

Strengths	Limitations
Benchmarks for performing self-assessment and evaluation procedures as a part of a collaborative and comparative exercise	Challenges in providing evidence
Benefits over a period of time; higher education institution addresses two or three benchmarks relevant for quality improvement of digitally enhanced learning and teaching	Lengthy evaluation process (can take up to several years)
Flexible and adjustable benchmarks; higher education institutions can customise the benchmarks, replacing or adding local performance indicators	Duplication across the benchmark topics
Monitors higher education institutions' achievements while providing high quality experience of technology enhanced learning for students and teachers	No online tool available (with a forum or pool) to compare with other best practices
Provides basis for research and practice of improvement, betters understanding of operational systems and processes and contributes to requirements of accountability	Does not always lead to change at an institutional level
Identifies strengths and weaknesses for planning, priority setting and development strategies for improvement	Results not comparable if institutions have not adopted the same methodology
Facilitates collaboration and understanding across the institution and with partners as well as building communities of practice	
Opportunities for professional development (project work, staff exchanges)	
Enables higher education institutions to meet regulatory compliance obligations	

Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) Technology Enhanced Learning Accreditation Standards (TELAS)

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
ASCILITE	Three phases of development from 2017-2019 The TELAS app was launched in July 2020	English	Course designers, educational designers, learning designers, and educational technologists	The standards and performance measures used in TELAS have been developed through a rigorous and extensive consultation process involving workshops with tertiary sector professionals and academics, a TELAS Strategic Advisory Group, and a National Summit involving key Australian senior higher education leaders	No evidence at this stage	Internal review: self-assessment is done offline using the free TELAS framework tool External review: Higher education institutions can choose to submit a course for formal accreditation (five badges: bronze, silver, gold platinum or diamond) or for peer review	Users can fill in the performance questionnaire and give themselves an overall performance rating As part of the external review, a summary report is issued	https://www.telas.edu.au/framework/ https://bit.ly/38BlLAX **Guidelines:** https://www.telas.edu.au/general-guidelines/

Description

This ASCILITE initiative, which is referred to as TELAS (Technology Enhanced Learning Accreditation Standards), seeks to introduce an internationally benchmarked accreditation scheme that will assess, assure, certify, and recognise the quality of online learning. TELAS has a number of objectives:

1. To raise awareness of good practice in the integration of technology-enhanced learning across the tertiary sector
2. To help ensure the quality of online learning in the tertiary sector
3. To encourage and motivate excellence in the utilisation of digital technologies in tertiary learning and teaching
4. To promote and recognise innovation and practice in the sustainable use of educational technologies to progress pedagogical practice
5. To externally validate online learning and provide a measure of performance that can be benchmarked and compared broadly across the global higher education sector.

In the long-term, TELAS aims to introduce a global benchmark of accredited online learning with potential partnerships in the USA, UK, Ireland and Europe.

The ten-page framework is divided into four main sections: *Online Learning Environment, Learner Support, Learning & Assessment Tasks,* and *Learning Resources*. These sections are then further divided into standards and specific performance criteria and associated success indicators. The success indicators contribute to the measurement of the performance criteria.

Strengths	Limitations
Self-assessment framework/questionnaire is free to use	Nominal fee required to benefit from external review
Main focus on accreditation and peer review	Scope is narrow; only useful for those carrying out course-level reviews
Higher education institutions can use accreditation to attract students	
Appreciated by students who want to be sure of the quality of the courses they are taking	No handbook
Clear and applicable descriptors	Does not cover the integration of digitally enhanced learning and teaching into an organisation

Commonwealth of Learning (CoL) Benchmarking Toolkit for Technology-Enabled Learning

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Commonwealth of Learning Authors of the toolkit are Michael Sankey and Sanjaya Mishra	2019	English	Institutional level with more of a Higher Education focus	Yes- draws on the original ACODE Benchmarks but adds some additional dimensions as well as having an underlying model with three distinct phases: Preparation, Development and Maturation	No evidence at this stage	Internal self-evaluation Users are encouraged to share their results with other institutions External review: optional but recommended	Users are provided with an Excel template to fill in their scores for each section which are presented in a summary report	https://bit.ly/2Xw6NWe

Description

The main aim of this toolkit is to promote the continuous improvement and quality assurance of technology-enabled learning. The toolkit also aims to help improve understanding of strategic and operational requirements, recognise areas of achievement, generate new ideas, and reinvigorate practice.

The first section contains ten benchmarking domains: *Policy, Strategic Plan, IT Support, Technology Applications, Content and Development, Documentation, Organisational Culture, Leadership, Human Resources Training* and *Technology Enabled Learning Champions*. Each of these benchmarks contains four to six performance indicators which users score using a five-point scale. Users can explore just one benchmark if they wish but are recommended to use all performance indicators. There is a place for rationale, evidence, and initial recommendations. Templates are also provided for calculating the user's score.

The second section consists of consolidating the benchmarking scores, which can be plotted on a radar chart in a freely downloadable Excel file. An overall summary contains all the evidence and initial recommendations noted by the user. Based on this, the user can devise plans and goals for moving forward.

Strengths	Limitations
Collaboration is encouraged with other institutions promoting an attitude that “we are all in this together”	It is up to the user to come up with final plans and recommendations; no real guidance seems to be given
Reviews are based on evidence rather than opinion	Does not provide good practice statements to clarify what this might look like nor does it offer explicit performance indicators
Scores are presented in a visual way (radar chart)	Underlying concept of maturity is problematic given the dynamic and rapidly changing nature of the field
Relatively simple to use and has been produced by a credible international organisation	Very limited effort to help institutions go to the next step to develop and implement any follow-up plan

DigCompEdu Framework

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Joint Research Centre (JRC) and the European Commission	2017	English, German, Spanish, Portuguese, Russian, Slovenian, Lithuanian, and others	Teachers at any educational level or sector	Based on extensive expert consultations	Yes	Used for educators' self-evaluation Used as a reference model for higher education institutions	Users of the DigCompEdu tool are given a score as well as tips for improvement	https://ec.europa.eu/jrc/en/digcompedu/framework **Guidelines:** http://bit.ly/35z5UAH

Description

The aim of the DigCompEdu framework is to capture and describe educator-specific digital competences. The framework comprises six different areas and their descriptors (i.e. total of 22 statements), which define the digitally competent educator. The following are the six areas: *Professional Engagement, Digital Resources, Teaching & Learning, Assessment, Empowering Learners,* and *Facilitating Learners' Digital Competences. Professional Engagement* concerns the usage of digital technologies for communication, collaboration, and professional development, whereas *Digital Resources* describes particular procedures regarding sourcing, creating, and sharing digital resources. *Teaching & Learning* predominantly looks at the management and the use of digital resources for teaching, and *Assessment* deals with the efficient usage of digital technologies and strategies to enhance assessment procedures. *Empowering Learners* investigates how digital technologies can be used to enhance inclusion, personalisation, and learners' active engagement. Finally, *Facilitating Learners' Digital Competences* looks into how to enable learners to use digital technologies in a creative and responsible manner for information, communication, content creation, wellbeing, and problem-solving.

The framework also provides a description of proficiency levels for digital competences. These levels are created in a very similar way to the proficiency levels for languages. The proficiency levels aim to encourage educators to use the framework and to improve their digital competences. These levels are: newcomer (A1), explorer (A2), integrator (B1), expert (B2), leader (C1), and pioneer (C2).

Strengths	Limitations
Universal, yet comprehensive	Traditional role of educator is challenged since competences that should be acquired by teachers do not encompass the idea of learning as a new methodology
Beneficial for teachers' personal /professional development	Prescriptive and obliging
Based on extensive theoretical perspectives, existing insights, and evidence	Implementation of the tool in the qualification processes within the university not well framed and designed; needs further concretisation regarding individual competence areas and/or subjects
Supporting materials available	Perspective on research is missing – focus is on educators

DigCompOrg Framework

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Joint Research Centre - Institute for Prospective Technological Studies (JRC-IPTS)	2015	English - allowed to reproduce and reuse in multiple languages	Educational organisations	Relies on *DigComp* (Digital Competence Framework for Citizens), which presents and defines 21st century competencies	Yes - the ideas presented in framework have been used to create self-evaluation tools, such as SELFIE	Can be used by higher education institutions to guide a process of self-reflection on their progress towards comprehensive integration and effective deployment of digital learning technologies	-	https://ec.europa.eu/jrc/en/digcomporg/framework **Guidelines:** https://publications.jrc.ec.europa.eu/repository/bitstream/JRC98209/jrc98209_r_digcomporg_final.pdf

Description

The framework aims to promote self-reflective and self-evaluation practices among educational organisations engaging with digitally enhanced learning and teaching. The framework can also support policy makers in the design, promotion, and implementation of various policies and projects aimed at incorporating technological advancements for learning and teaching in educational and training systems.

The DigCompOrg framework consists of seven thematic units and fifteen sub-units, which are relevant to all education sectors, as well as an additional "sector specific" unit. The following are the main thematic units: *Leadership & Governance Practices, Teaching & Learning Practices, Professional Development, Assessment Practices, Content & Curricula, Collaboration & Networking,* and *Infrastructure*. All of the aforementioned thematic units are inter-related and consistent, thus, are treated as a single complete entity. Each thematic unit covers a different topic relating to the adoption and implementation of digital learning technologies. For each of the units and subunits, 74 descriptors were developed. The graphical representation of the framework comprises a circular shape. The seven thematic units and fifteen sub-units make up the outer rim and the descriptors are represented by 74 spokes radiating towards the centre. A blank space is left for sector-specific descriptors.

Strengths	Limitations
Consistent and comprehensive	Consists of thematic units, sub-units, and at least 74 descriptors- potentially challenging to manage it
Provides guidelines for self-regulation and self-evaluation for educational organisations	Adding characteristics of educational sector may disrupt the integrity of the framework as everything is already consistent and inter-related
Flexible and compatible with existing frameworks and tools	Focuses on teaching, learning, assessment, and related activities undertaken by organisations and does not address the full range of administrative and management information systems already in use
Provides guidelines and recommendations rather than forcing action and there are no prescriptions or strict obligations	No guide to implement this framework or carry out self-assessment

E-learning Maturity Model (eMM)

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Stephen Marshall as an individual academic employed at Victoria University of Wellington, New Zealand	First launched in 2003, with a second version released in 2006 followed by minor tweaks after this date, with V2.3 published in 2007	English	Higher education leaders and managers	Based on quality management literature and more specifically based on the ideas of the Capability Maturity Model (CMM) and Software Process Improvement and Capability Determination (SPICE) methodologies	Yes- in Australian and New Zealand universities with some evidence of uptake elsewhere around the world such as Finland	Internal self-evaluation and comparison with other institutions External review is possible	Each process can be rated and an overall result for each dimension can be calculated	http://e-learning.geek.nz/emm/ **Guidelines:** http://e-learning.geek.nz/emm/publications.php

Description

The e-learning Maturity Model (eMM) is the oldest instrument in this inventory, with the first version dating back to 2003. It is a quality improvement framework which aims to support educational institutions in improving their technological capabilities for teaching and learning in a complex and changing environment. The main aim of the eMM is to provide a quality improvement framework for higher education institutions with a focus on holistic capability.

The eMM is broken down into five process areas or dimensions, each defining a key aspect of the overall ability of institutions to perform well in the delivery of e-learning. The following are five process areas in the second version of the eMM: *Learning, Development, Support, Evaluation,* and *Organisation*. Each process in the eMM is further broken down within each dimension into practices that define how the process outcomes might be realised by institutions. These practices are either essential for the process to be successfully achieved (bold type) or just useful in supporting the outcomes of the particular process (regular type). The practices intend to capture the main essence of each process dimension through a series of items that can be examined easily in a given institutional context. During an assessment, each practice is rated from "not adequate" to "fully adequate" either by an external or internal reviewer in reference to the practice statement. The ratings for each practice¬ are decided upon based on evidence gathered by the institution. Once each practice has been examined, the results are averaged to provide an overall rating for the given process dimension.

Strengths	Limitations
A benchmarking tool without any intention to rank institutions but rather to promote self-improvement	Too complicated; no longer widely used and hence lacks sustainability
Can assist with organisational change by providing managers, academics and other practitioners with the necessary means to encourage greater institutional engagement with e-learning	Structure is very difficult to interpret, especially for colour blind people

European Association for Quality Assurance in Higher Education (ENQA)- Considerations for Quality Assurance of E-learning Provision

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
A group comprising members from ENQA agencies in Croatia, Spain, Sweden, the Netherlands, Estonia, Switzerland, Austria, and Germany Funded by Erasmus+	2018	English	Higher education institutions, Quality Assurance agencies, stakeholders	Yes- combines elements from the working group analyses of relevant international reports and the experience and know-how of QA agencies	Yes- across Europe	Self-evaluation External Assessment	-	https://bit.ly/3qh1VAD

Description

The main goal of the framework is to provide guidance to i) higher education institutions and ii) QA agencies on how to apply the European Standards and Guidelines (ESG) for Quality Assurance in the European Higher Education Area 2015. In the context of higher education institutions, the framework aims to guide the internal quality assurance of e-learning programmes by outlining the standards and the applicability of the standards to e-learning programmes and higher education institutions. Success indicators are also provided. In the second part of the framework, similar guidance is also provided to QA agencies but in the context of external quality assurance reviews of higher education institutions' e-learning courses. An introductory section identifies the context in which this framework may be useful, and a final section reports on the conclusions of the working group. A glossary is also provided.

Strengths	Limitations
Succinct but comprehensive framework; well-structured and clearly written	Too specific; focuses solely on quality assurance
Evaluation of non-traditional forms of education, using traditional methodologies, while also offering points to consider when designing courses that utilise e-learning	Higher education institutions would need a team to undertake an internal review and devise a roadmap; feasibility would depend on the experience of the higher education institution's staff
	Does not cover the topic of digitalisation at an institutional level
	Recommendations remain abstract or shallow
	No indications of possible resources

European Maturity Model for Blended Education (EMBED)

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
EMBED project collaboration between seven European institutions, coordinated by EADTU	2019	English	Lecturers and educators, institutions, policy makers, and educational centres	Informed by a literature review; however, it is not necessarily underpinned by a theoretical perspective or any specific literature	Yes	Can be used to tackle any conceptual or implementation issues regarding blended learning, teaching, and education	-	http://bit.ly/3icwWmD

Description

The framework is divided into three levels, course (micro), programme (meso), and institutional (macro). The course and programme levels both focus on the design process, flexibility, and experience, with the course level also considering interaction. The institutional level focuses on support, strategy, sharing and openness, professional development, quality assurance, governance, finance, and facilities. Each level has its own dimensions and descriptors that are used to determine the level of maturity. The main goal of this framework is to analyse and evaluate blended learning practices, conditions, strategies, and policies in a precise and consistent manner so that areas for improvement and optimisation can be highlighted.

Strengths	Limitations
Broad; covers all levels of an institution	Practical applications may be challenging without self-assessment/ evaluation tool or scale
Comprehensive; using the framework, an institution can receive a full overview of their current state of blended learning practices at all three levels and note the areas that still need some attention	Levels and sub-dimensions are rather difficult to visualise collectively; thus, challenging to determine inter-connections
Validated by an international group of blended learning experts, applying the Delphi study approach	Neither the macro-level description nor the framework for pedagogical and institutional change are in the publication
	No instructions on how to conduct a review/draw up an action plan; higher education institutions might struggle to implement an action plan after reviewing the tool
	Questionable whether three levels are enough; higher education institutions might fall between these levels

E-xcellence - Quality Assessment for E-learning: a Benchmarking Approach (3rd edition)

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
E-xcellence project partners, under leadership of EADTU	2009 with two updates since then	English Manuals available in Spanish, Russian, and Slovak Benchmarks are available in German and Estonian Quick Scan Questionnaires are available in French, Spanish, and Italian	Leaders of higher education institutions and staff members concerned with the design, development, teaching, assessment, and support of e-learning programmes	-	Yes- list of institutions with the Excellence label available on their website	Internal self-evaluation External review	For the internal review, users can carry out a 'quickscan' and receive an email with a summary of their results	https://e-xcellencelabel.eadtu.eu/e-xcellence-review/manual **Guidelines:** https://e-xcellencelabel.eadtu.eu/images/E-xcellence_manual_2016_third_edition.pdf

Description

The aim of this tool is twofold; first, it aims to support higher education institutions undergoing an internal self-assessment of their e-learning programmes, and second, it assists e-learning experts who are conducting external reviews of higher education institutions' e-learning programmes. The tool issues reports, recommendations, and sometimes E-xcellence labels for the educational institutions.

The tool offers two options for higher education institutions. Higher education institutions can either undertake a self-assessment or opt for an external review. In the case of self-assessment, higher education institutions have to complete a quick scan questionnaire. Then, an email with findings, diagnosing their e-learning programmes and the manual, is sent to them. They can use these findings and the manual to conduct an internal review. The manual consists of six chapters/areas, including *Strategic Management, Curriculum Design, Course Design, Course Delivery, Staff Support,* and *Student Support*, and can be used for planning the process of improvement. Each of the areas/chapters include benchmarks, indicators, and examples of what constitutes 'at excellence level'. There is a glossary at the end of the manual.

In the case of an external review, higher education institutions are also required to complete a questionnaire. E-learning experts then carry out an online or on-site review. Once the review is finished, higher education institutions receive a report, recommendations, and, if they meet the criteria, the E-xcellence label, which is valid for three years. The external review not only helps higher education institutions with the design, development, teaching, assessment, and support of e-learning programmes, but also allows them to review their e-learning programmes in terms of accessibility, flexibility, interactiveness, and personalisation. The report also provides recommendations on how to improve these aforelisted areas.

Strengths	Limitations
Comprehensive and well-written; language is accessible and follows a logical format	Extended external review (in particular the on-site review) option may be too expensive for certain higher education institutions
Wide target group and therefore can be used in both national and international contexts	Manuals, benchmarks, and quick-scan questionnaires are not translated into the same languages
Motivating; those who opt for the external review may be awarded a label	Quick-scan questionnaire and accompanying report are very basic
Enables comparison among European higher education institutions	

HEInnovate

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
European Commission, DG Education and Culture, the OECD LEED Forum, and panels of independent experts	2013	Available in 24 different languages	All types of higher education institutions, including universities, colleges, and polytechnics	No specific theoretical background, but has been created by using policy evidence and experience	Yes- used by over 1000 institutions	Tool facilitates self-assessment procedures at higher education institutions Used by external reviewers for making comparisons between different countries and their higher education institutions	Users are issued a self-assessment report with a score and guidance notes	https://heinnovate.eu/en/user/login **Guidelines:** https://heinnovate.eu/sites/default/files/heinnovate_training_manual.pdf

Description

HEInnovate is a tool for higher education institutions to self-assess their entrepreneurial and innovative competences. The tool is also used by external reviewers for making comparisons between higher education institutions in different countries. It consists of eight self-assessment areas: *Leadership & Governance, Organisational Capacity: Funding, People & Incentives, Entrepreneurial Teaching & Learning, Preparing & Supporting Entrepreneurs, Digital Transformation & Capability, Knowledge Exchange & Collaboration, The Internationalised Institution,* and *Measuring Impact*. Each of these areas are necessary for the self-assessment of a higher education institution in regard to its readiness to embrace innovations and become an entrepreneurial institution. Under each of these area-headings, reviewers evaluate statements (37 in total) using a five-point scale, where 1 signifies the lowest and 5 indicates the highest score. Underneath each statement, there is a sliding bar which the user/reviewer moves in order to indicate the score. There is also the option to choose "not applicable" (N/A). Once the questionnaire is filled out and all the statements have been evaluated, the tool generates the average result for each of the afore-mentioned areas. The tool also identifies strengths and weaknesses.

Strengths	Limitations
Free, easily accessible, open, and flexible tool for self-assessment of higher education institutions	Focuses on management level issues related to entrepreneurship but barely touches the learning/teaching /assessment processes
Provides support and training materials for workshops	Student as consumer/customer is promoted
Different contexts of particular higher education institutions taken into consideration	Strong focus on entrepreneurship and innovation
Comprises a wide range of areas for assessment with higher education institutions receiving in-depth evaluation regarding their entrepreneurial activities and innovative strategies	Following up on the report would be demanding in terms of human resources
Provides tangible output which allows higher education institutions to see their strengths and weaknesses; offers useful case studies and resources to further development and organise training courses	Detailed explanations for each statement could lead to fatigue and users not following through
	Nothing to explain what constitutes a low score (examples are provided for how to score a five)
	Does not require any evidence gathering; only someone with solid knowledge of the higher education institution's policies could complete this exercise

HolonIQ Digital Capability Framework

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
HolonIQ	2018 and revised in 2020	Available in 24 different languages	Higher education institutions with a strong global focus	Based on a considerable amount of data that HolonIQ collects on higher education institutions	Yes	Internal self-review	Users who pay a fee have access to an individual score and benchmarked results	https://www.digitalcapability.org
						External review with consultancy available upon request		**Guidelines:** https://www.digitalcapability.org/docs/HolonIQ_HEDC_Framework_Sep_2020.pdf

Description

The HolonIQ Digital Capability Framework offers an overarching view for institutions to map and measure digital capabilities across the learner lifecycle. The overall aim is to promote practical and sustainable approaches to digital services and online learning. This is an open-source framework which identifies four core dimensions along the learner lifecycle: *Demand & Discovery* (DD), *Learning Design* (LD), *Learner Experience* (LX) and *Work & Lifelong Learning* (WL). There are sixteen capability groups or 'domains' within these dimensions, and more than 70 capability blocks, which add a further level of detail.

To carry out a full self-assessment, users are required to pay a fee that gives them access to additional tools, namely an institutional diagnostic survey and benchmarked results. When full access is granted, institutions can self-rate their performance against each of the 16 domains: *Product and Service Design, Marketing Processes, Student Recruitment* and *Enrolment Management* (DD); *Curriculum Design, Digital Content & Courseware, Subject Matter Expertise* and *Teaching Strategies* (LD); *Academic Administration, Learning & Academic Experience, Student Life* and *Assessment & Verification* (LX); *Work Integrated Learning, Career Planning & Placement, Industry & Business Engagement* and *Alumni & Continuing Education* (WL). Users who opt for the fee-paying service can rate their institutions' performance and the importance of each digital capability in their context against a "gold standard statement" using a five-point scale. Users are issued with a score for each dimension in the form of a heatmap.

Strengths	Limitations
Offers an institution-wide perspective of what is needed to build digital capability across an institution	Approach is quite business focused
Users can provide feedback on the framework, which is regularly updated	Little offered in terms of how to apply or implement the framework
Designed to allow flexibility and interpretation in context	To fully avail of the additional tools which accompany this framework, higher education institutions are required to pay a fee
Community around the use of the tool allowing users to benchmark their results	Does not offer much in terms of measures for improvement and next steps
Wide target group and therefore can be used in both national and international contexts	

JISC Digitally-Capable Organisation

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
JISC	2017	English	Leaders, managers, and change agents with responsibility for developing digital capability	Framework based on a study of 14 UK institutions (Feb-June 2017) using the digital capability discovery tool	No evidence at this stage	-	-	https://www.jisc.ac.uk/full-guide/developing-organisational-approaches-to-digital-capability **Guidelines:** http://repository.jisc.ac.uk/6610/1/JFL0066F_DIGICAP_MOD_ORG_FRAME.PDF

Description

The framework seeks to provide an organisational perspective on JISC's 6 Elements of Digital Capability. It should be noted, however, that there is some confusion over the six elements as they appear differently on different pages of the website. To illustrate this, on one website page, they are listed as: *ICT Proficiency, Digital Learning & Development, Information Data & Media Literacies, Digital Creation, Problem Solving & Innovation, Digital Communication, Collaboration & Participation, and Digital Identity & Wellbeing. Elsewhere they are listed in the following manner: ICT Infrastructure, Learning, Teaching & Assessment, Communication, Content & Information, Research & Innovation,* and *Organisational Digital Culture*.

The framework is based on 14 case studies from institutions in the UK who have used the capability discovery tool, which aims to help staff and students reflect on their digital capabilities. For more information on these case studies, see here. The tool takes a holistic approach to enhancing digital capability, emphasising that the wider organisational culture is just as important as investment into the development of teaching/learning practices. As a result, the term "digital" becomes problematic as the question is raised whether the aim is to establish a digitally-capable organisation, where the main focus lays on technologies, or whether we want to create an organisation that is digitally capable, with the focus in this case being on organisational culture. The distinction is very subtle but worth consideration.

Strengths	Limitations
Promotes a wider perspective on organisational culture and advances the idea that development needs to go beyond teaching and learning	Website is confusing and it is difficult to distinguish between the elements because their titles keep changing
	Framework does not rely on a theoretical perspective but rather built on case studies and anchored in literature from a business perspective

Leibniz Digital Benchmarking Tool

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
IWM Leibniz in cooperation with Hochschulforum Digitisierung	-	German	Staff members of higher education institutions who are in charge of strategic digitalisation of learning and teaching	-	No evidence at this stage	Self-evaluation of leadership	Users receive feedback on how strong each benchmark is	Not available yet Description of the tool

Description

The tool consists of eleven benchmarks, namely *Mission Statement, Strategy, Decision-Making Structures, Innovation Culture, Financing and Resources, Infrastructure and Equipment, Quality Management, Support Structures, Incentive Systems, Legal Framework,* and *Learning Status and Curriculum*. Each benchmark includes a short narrative or explanation (2-3 sentences).

To find out how strong a benchmark is at a higher education institution, 12 indicators belong to each one. The indicators relate to specific measures that universities can implement and that help achieve the ideal state of the benchmark. Managers at higher education institutions can rate the implementation of the indicators at their institution on a 4-point scale: the measure has either not been implemented, is currently being planned, is currently being implemented or has already been achieved. Based on the evaluation of all 12 indicators per benchmark, higher education institutions receive feedback on how strong the benchmarks are.

The main objective of the tool is to assess the current state of the digitalisation of learning and teaching, and to identify opportunities for development through benchmarking with other (German) institutions and possibly with groups of institutions (universities, colleges, private, and public, within a particular state).

Strengths	Limitations
Easy way for higher education institutions to assess their state of digitalisation	Educational aspects seem to be rather weak
Provokes internal discussions on strategic and organisational enhancement	Area and context specific, i.e. designed for German higher education institutions
May start dialogue with one or several peer institutions	Concern that indicators towards institutional cultures, different institutions, and different levels of development are neutral
Helpful for institutions just starting the digitalisation of teaching and learning or have many bottom-up initiatives without much top-down consideration	Does not rely on any theoretical background

National Quality Standards for Online Education (NSQ)

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
The Southern Regional Education Board- USA (SREB)	Launched in 2007 Updated in 2019	English	Schools, districts, state agencies, state-wide online programmes, and other interested educational organisations	Underpinning philosophy is that the standards should be updated regularly through literature reviews and feedback from users to ensure they remain useful and relevant	Yes	Internal self-evaluation	-	https://www.nsqol.org/the-standards/ **Guidelines:** https://youtu.be/FnYPgO_n37w https://www.nsqol.org/resources/

Description

The aim of these standards is to provide the online and blended learning community (mainly schools) with an updated set of openly licensed standards to help evaluate and improve online courses, programmes, and teaching. There are three sets of standards which complement one another. They provide guidance but aim to be flexible. Each set contains standards and indicators, which are explained using an example. For instance, the online teaching set includes the following standards: *Professional Responsibilities, Digital Pedagogy, Community Building, Learner Engagement, Digital Citizenship, Diverse Instruction, Assessment & Measurement,* and *Instructional Design*. The second set, which focuses on online programmes covers the following areas: *Mission Statement, Governance, Leadership, Planning, Organisational Staff, Financial & Material Resources, Equity & Access, Integrity & Accountability, Curriculum & Course Design, Instruction, Assessment & Learner Performance, Faculty & Staff Support, Learner & Parent/Guardian Support,* and *Programme Evaluation*. The last set of standards, on online courses, includes the following: *Course Overview & Support, Content, Instructional Design, Learner Assessment, Accessibility & Usability, Technology,* and *Course Evaluation*. Finally, educational institutions who have used the standards can provide feedback and be involved in the revision process. As a result, the updated standards are not abstract and reflect what is truly needed on the ground.

Strengths	Limitations
Multi-faceted; three sets of standards which complement one another	Using these standards requires a team in charge of digital learning
Easy to understand; each indicator is accompanied by an explanation and an example	Originally for schools, not higher education institutions, and might need to be adapted
Accessible (openly-licensed)	Lack of an institutional perspective on digitalisation
Revised regularly and based on users' feedback	No accompanying material for the evaluation process
Provides guidance, yet flexible	Lack of references and resources for implementation and execution
Versatile- for online and blended learning	

Online Learning Consortium (OLC) Quality Scorecard Suite

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Online Learning Consortium (OLC)	First launched in 2010 but expanded in 2016	English and Spanish (one scorecard)	American higher education institutions	The DELPHI method was leveraged and the suite is grounded in research and expert, peer-led best practice guidance	Yes- testimonials on website	For an internal review, higher education institutions can download free scorecards and purchase the handbook More examples: http://bit.ly/39AS3eo External review available for institutional members	Users fill in the scorecards themselves and calculate their own score Interactive scorecard is a feepaying service	http://bit.ly/3bBlpfq **Guidelines:** Guidebook must be purchased

Description

The aim of the OLC Quality Scorecard Suite is to provide higher education institutions with the necessary criteria and benchmarking tools to ensure online learning excellence. The Suite consists of six scorecards: *Administration of Online Programs, Blended Learning Programs, Course Design Review, Quality Course Teaching & Instructional Practice, Digital Courseware Instructional Practice,* and *Online Student Suppor*t.

The scorecard, *Administration of Online Programs, includes seven sections: Institutional/ Administration Support, Technology Support, Course Development/Instructional Design, Teaching & Learning, Faculty Support, Student Support,* and *Evaluation & Assessment*. Each section contains statements that are scored by respondents from 0 to 3 (0= deficient, 1= developing, 2= accomplished, 3= exemplary). The second scorecard, Blended Learning Programs, follows a very similar format to the first scorecard. There are seven sections with statements that are rated using the same 3-point scale. The third scorecard, Course Design Review, is a four-page scorecard and it consists of six sections: *Course Overview & Information, Course Technology & Tools, Design & Layout, Content & Activities, Interaction,* and *Assessment & Feedback*. Each section contains statements which the respondent has to rank as either sufficiently present, minor revision, moderate revision, major revision, not applicable or action plan. The fourth scorecard on Quality Course Teaching and Instructional Practice contains ten sections: *Course Design, Accessibility, ADA Compliance & Universal Design, Course Learning Outcomes, Course Content, Assignments, Instructor Role, Class Discussion & Engagement, Building Community, Communication,* and *Continuous Course Improvement*. Each section includes statements that have to be ranked from 0 to 2 (0= emerging, 1= accomplished and 2= exemplary). The fifth scorecard, Digital Courseware Institutional Practice, is the shortest scorecard with only five sections, *Learning Foundations, Faculty Engagement, Student Engagement, Course Fundamentals,* and *Continuous Improvement*,

each containing statements to be ranked. The sixth and final scoreboard, Online Student Support, is a 14-page scorecard that is divided into 11 sections: *Admissions, Financial Aid, Pre-enrolment Advising, Veteran's Services, Career Counselling, Orientation, Post-enrolment Services, Library, Students with Disability Services, Technology Support,* and *Graduate Student Support*. Each of the sections include statements to be ranked. Finally, for two of the scorecards, Administration of Online Programs and Blended Learning Programs, an interactive option is offered; however, it is only available for the OLC members.

Strengths	Limitations
Considered to be professional and reliable	Higher education institutions must be institutional members to access and benefit from external review and be eligible for endorsement or even to access the interactive scorecards; Membership ranges from $1,600-$4,500 per year; may be too expensive for some higher education institutions
Embodies an institution-wide approach	
Provides a framework for strategic planning evaluating programs; helps to identify areas for change and re-assessment annually	
Used as a baseline to show where higher education institutions benchmark in relation to online learning best practices	National context (American) so might not be appropriate for European higher education institutions
Used by various types of higher education institutions: universities and community colleges	Primarily in English; only one scorecard available in Spanish
Covers six areas (administration of online programs, blended learning programs, quality course teaching and instructional practice, course design review, digital courseware instructional practice, online student support)	Handbook must be purchased (approximately $60), however, not all institutions would be willing to pay
Thorough external review; higher education institutions receive peer-reviewed analysis and detailed recommendations	
Non-members carrying out an internal review can download scorecards and purchase the handbook, which explains how to fill in the scorecards	

Quality Matters

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Quality Matters Association	2014	English Also available in other languages (Chinese)	HE and primary and secondary education community – teachers and education providers	Strong peer review philosophy	Yes- community of over 1000 colleges and universities, comprising more than 50,000 education professionals	Used to peer-review online and blended learning courses Showcase of best practice: http://bit.ly/3ibaM44	Simple option: users can calculate their own score For members: official reviews and certification options available	https://www.qualitymatters.org Higher education institution version: http://bit.ly/35DFk9y

Description

The aim of this framework is to peer-review online and blended learning courses in higher education institutions as well as primary and secondary schools. The framework relies on a strong theoretical perspective as it is based on research and studies. The framework adopts a strong peer review philosophy, reflecting the understanding that quality has to live throughout an institution. In this respect, what makes Quality Matters unique is not the framework or supporting quality rubrics, but rather the emphasis on creating a culture of scholarly peer review. The framework is intended to scaffold conversations about quality among colleagues.

The standards are developed for course level and are focused on the following areas: *Course Overview/Introduction, Learning Objectives* (i.e. Competencies), *Assessment & Measurement, Instructional Materials, Course Activities & Learner Interaction, Course Technology, Learner Support,* and *Accessibility & Usability*. Whilst primarily a tool for promoting internal quality of online and blended courses following a peer review approach, the QM label is often used for external accreditation purposes because it is regarded as the most credible quality indicator in the US. Finally, a number of educational organisations, including a community of over 1000 colleges and universities, and over 50,000 education professionals had successfully used the framework by autumn 2020. A printed version of the instrument can be downloaded for free online, however, only members of the Quality Matters Association can access the interactive version.

Strengths	Limitations
Easy to implement in higher education institutions	Difficulties in accessing the framework online
A strong emphasis on peer review and self-improvement	Available only for members of the association
An emphasis on building a culture of peer review where ownership for quality resides with the academic community rather than some central quality police	
Focus on course didactics	
Strong theoretical basis	

Quality and Qualifications Ireland (QQI) Blended Learning Guidelines

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Quality and Qualifications Ireland (QQI)	2017	English	Educational institutions that offer blended learning programmes	-	Yes- for more information, see here	Supporting educational providers in quality assurance procedures and improvement of blended learning	-	https://bit.ly/2N86T4N

Description

The framework outlines quality assurance (QA) guidelines established by Quality and Qualifications Ireland (QQI) for all providers of blended learning programmes. The guidelines focus on the following areas: *Organisational Context, Programme Context*, including development and assessment, and *Learner Experience Context*. The framework/ guidelines are intended to support providers when designing, establishing, evaluating, maintaining, and/or reviewing quality assurance procedures for blended learning. They can also be used as a basis for approval by QQI.

Strengths	Limitations
Guidelines are comprehensive, providing insight into issues related to learners, and to blended learning	Guidelines lack information on blended learning implementation
Detailed and well-written; information is clear and digestible	Some statements in the guidelines are generic
Free of charge	Provides little in the way of implementation guidance

Self-reflection on Effective Learning by Fostering the use of Innovative Educational Technologies (SELFIE)

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Joint Research Centre (JRC) in partnership with the Directorate-General for Education, Youth, Sport and Culture (DG EAC) of the European Commission	2018	31 Languages	School leaders, administration, teachers, and students in primary, secondary, and vocational schools	Based on DigCompOrg framework	Yes- used in more than 7000 schools in over 50 different countries	Internal review Facilitates a self-evaluation process for schools in terms of their usage of digital learning technologies	Users receive a score report outlining their strengths, weaknesses and areas of improvement	https://ec.europa.eu/education/schools-go-digital_en **Guidelines:** https://ec.europa.eu/education/schools-go-digital_en

Description

SELFIE contains different questionnaires for three stakeholders within the school setting: school administration, teachers, and students. Each stakeholder has to provide answers to reflective statements and questions related to the use of digital learning technologies. The tool consists of seven segments: *School Strategies, Teaching, Learning, Assessment, Infrastructure, Curricula,* and *Students' Attitude & Experiences*. There are mandatory (so-called "core items") and optional items that can be chosen by the school according to their individual needs and context. Once the questionnaires are filled out by all the stakeholders involved (administration, teachers, and students), the school receives an in-depth report on how their school uses digital learning technologies by highlighting strengths and weaknesses. Upon the completion of the questionnaires, each participant receives a digital badge. It takes approximately 20 – 40 minutes to fill out the questionnaire.

Strengths	Limitations
Free participation	No real guidance towards recommendations or action plan for improvement
Easily adjusted to fit individual schools' needs and contexts allowing schools to expand its application	Most questionnaire items are statements that the participants need to rate, with no room for more detailed explanations or comments in order to evaluate the situation
Involves the entire school community, which ensures different perspectives in the results	Challenges in involving the entire school (i.e. administrative staff, teachers, and students)
Descriptive rather than prescriptive results; each school can decide how to use the results provided in the report	For inexperienced schools, the interpretation of the results and work towards improvement could be challenging
Based on the DigCompOrg framework, which has a strong methodological and conceptual basis	
Available in 31 different languages, which increases accessibility for various stakeholders	
The data safety procedures and protocols; all schools remain anonymous (no risk of rankings)	

UNESCO Blended Learning Self-Assessment Tool

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
UNESCO Bangkok	2016	English	Higher education institutions in Asia Pacific area	Based on framework presented in: *Blended learning for quality higher education: selected case studies on implementation from Asia-Pacific*	No evidence at this stage	Self-evaluation and self-assessment in terms of adopting practices of blended learning	Users receive a self-generated report with a score for each dimension	http://bit.ly/2MWnl7S **Guidelines:** http://bit.ly/39uUDm9

Description

This self-assessment tool aims to deepen higher education institutions' knowledge about blended learning practices and increase the overall quality of education in the Asia-Pacific region. The main purpose of this tool is two-fold; first, to assist higher education institutions in evaluating their approach to blended learning and second, to list struggles and areas for improvement. The tool consists of eight dimensions: *Vision & Philosophy, Curriculum, Professional Development, Learning Support, Infrastructure, Facilities, Resources & Support, Policy & Institutional Structure, Partnerships,* and *Research & Evaluation*. Each of the dimensions are composed of statements that are directly related to the focus of the dimension.

During the self-evaluation process, reviewers are required to respond to the brief statements (often one- or two-word phrases) by choosing the answer (i.e. *under consideration, applying/emerging, infusing, transforming*) that best reflects the situation in their higher education institution. Very brief explanations of each individual statement (thematic unit) are provided. There is a blank box at the bottom, where the user can briefly describe the situation in their higher education institution and provide any evidence or documentation needed. Once the statements are evaluated and additional information or documentation is provided, a self-assessment tool analyses the data and provides the results in a graphical format, i.e. *spidergram*. The visualisation of the results aims to provide a holistic view of all the dimensions and their relations.

Strengths	Limitations
Highlights problems and suggests improvement	Developed for a specific region and may not be applicable in other regions due to culture, experience in digitally enhanced learning and teaching, resources, approaches, and attitudes
Guidelines for improvement of blended learning practices	Portrays situation through the lens of policy makers and administrative bodies of higher education institutions
Based on a framework and allows for a holistic view of the situation regarding blended learning	Strong emphasis on a top-down approach to decision making
Offers visual representations; graphical representation of results is more appealing and easier to interpret	Requires a lot of user input
Free of charge; available online without any registration	Challenging for users to evaluate statements without prior knowledge
Concrete structure	Focus on logistics and infrastructure rather than learning design and didactical approaches and strategies
	Too narrow, focuses only on one type of learning (blended)
	Free to use, however, with limited funding, it could be difficult for a higher education institution to follow up on the assessment report
	Developing an action plan based on recommended resources might be overwhelming

3E Framework

Created by	Launched in	Languages	Target group	Theoretical perspective	Implemented	Used for	Feedback	Link(s)
Keith Smyth	2011	English	Academic staff i.e. those involved in teaching rather than senior institutional leaders	Based on a simple three level continuum of Enhance-Extend-Empower for using technology to support learning, teaching, and assessment across disciplines and levels of study	Yes	Internal evaluation at course rather than institutional level	-	https://staff.napier.ac.uk/services/vice-principal-academic/academic/TEL/

Description

The 3E Framework aims to support staff in the practical implementation of technology-enhanced learning and develop their teaching, learning, and assessment practices beyond basic levels. Based on a three-level structure, the framework provides descriptive examples of a series of learning and teaching activities that can be adopted by practitioners. The first level, Enhance, includes activities that might be adopted as a minimum, while the next two levels, Extend and Empower, promote the use of more sophisticated digital technologies for teaching and learning.

The following are some of the activities addressed at each level: *Essays, Group Work and Group Work Management, Lectures, Tutorials, Seminar Participation, Making Teaching More Interactive, Supporting Large Cohorts, Student Evaluation and Student-Staff Liaison, Self-Testing, Encouraging Timely Engagement in Key Concepts, Supporting Engagement with Guest Experts and in Relevant Professional Communities, Work-based Learning, Preparing for and Undertaking Laboratory and Field Work, Supporting Transition and Articulation, Contributing Knowledge to the Public Domain, Peer Mentoring Interdisciplinary Learning, Providing Globalised Learning Opportunities, Engaging Undergraduates in Research-based Activity,* and *Support and Networking for Research Students*.

There is also a list of additional resources available to staff for incorporating technology into their learning, teaching, and assessment practices, including contacts for one-to-one support, staff development events, and online resources.

Strengths	Limitations
Pedagogical focus at the course level and more specifically in the context of VLE use	Does not really help foster deeper conversations about the how and why of digitally enhanced teaching and learning at a wider institutional level
Offers examples to help illustrate the three different levels and it is relatively simple to understand	No consideration of leadership, organisational culture and infrastructure which may constrain or enable more extended uses of technology for teaching and learning
Could be used by individual staff members or the whole faculty/ department	Difficult to know whether there is community around this framework

DIGI HE

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