Digitally Enriched Education Booklet

كتيب التعليم المعزز بالرقمنة

This document is part of a series that defines, explains, and demonstrates Qatar University's five Education Excellence Themes.

Qatar University

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Introduction

Qatar University's mission is "to equip current and future citizens of Qatar with the skills, expertise and competencies they need to be able to contribute to, and lead, Qatar's development for the benefit of future generations" (Qatar University Strategy 2018–2022, p. 20). To achieve this, the university has rigorously pursued educational excellence. Having developed and implemented its Education Excellence Framework, the university aspires to be regionally recognized for the provision of holistic education. The five main themes of the Education Excellence Framework are: learner-centric, experiential, research-informed, digitally enriched, and entrepreneurial education. These five aspects of a holistic education will yield graduates who are well-rounded and who have attributes, competencies, and values that will enable them to maximize their future impact locally and internationally (Qatar University Strategy 2018-2022). This document is part of a series that defines, describes, explains, and demonstrates Qatar University's five themes for education excellence. This document focuses on **digitally enriched education**. The objectives of the document are to:

1. Motivate readers to relate the digitally enriched education to their educational backgrounds, professional practices and characteristics as instructors at Qatar University.
2. Familiarize readers with theory and research on digitally enriched education.
3. Demonstrate some of the teaching and learning skills required to implement digitally enriched education.
4. Introduce strategies for applying digitally enriched education in higher education.
5. Introduce methods of assessment appropriate for digitally enriched education in higher education.

This document was created for Qatar University educators and attempts to distill, organize, and highlight key elements from the vast amount of research, literature, and information on digitally enriched education that already exists in academia. This document references a wide variety of educational resources in order to identify critical points, perspectives, practices, and definitions of digitally enriched education, and attempts to guide the reader through some of the steps necessary to structure and implement digitally enriched educational practices in Qatar University contexts.

Overview of Digitally Enriched Education

Nowadays, higher education students are called Digital Natives or Generation Z (ECDL, 2014). That is, they live in an environment dominated by the presence of digital devices and tools. It is an era where social networking, blogs, e-mails, online games, videos, wikis, among other tools, have become commonplace elements of our collective existence. Therefore, educators are called upon to readjust their strategies and methods and integrate technology in teaching in order to achieve their educational goals and objectives. Teaching that is enhanced by technology is called Digital Education, Digitally Enriched Education, or Technology Enabled/Enhanced Learning. It consists of the creative use of digital resources and technologies in teaching and learning. Digitally enriched learning environments effectively integrate a variety of ICT tools to support and facilitate learning. They creatively combine learning objectives, tasks, materials, methodologies, instructors, and students with appropriate technologies in order to help learners assume more active personal roles in the learning process. A digitally enriched educational experience can be as simple as an educator integrating multimedia materials into an on-campus class or involve more complex uses of technology to create flipped classes or even entirely online courses (McLaughlin, 2018).

Digitally enriched education can enhance the learning environments in the following ways: (1) improving academic achievement, (2) increasing student's ability to direct and manage their learning, (3) strengthening "core" academic/ digital and life skills (collaboration, communication, etc.), (4) emphasizing critical thinking, problem-solving and high-order reasoning skills, (5) increasing productivity, and (6) promoting educational research. Still, many challenges are involved in implementing digital enriched education. These include:

1. Although young people are technologically literate concerning social networking and using mobile technologies as everyday tools, they could be novices in their understanding and implementation of these same tools in purposeful and educationally oriented ways. In other words, educators should not assume that their "digital native" students automatically understand how to use every digital device or resource.
2. Many instructors generally resist change. When they are comfortable with one approach, it becomes difficult to change it.
3. Higher institutions must innovate to adapt and succeed in this rapidly changing world. “Digital transformation is changing the job market and requiring new skill sets. Digital technologies will also offer new ways of learning. To reap the benefits of these trends, education and training systems need to respond better to these changing realities” (Rampelt et al., 2019).

Theory Related to Digitally Enriched Education

Research highlights the importance of applying technology in teaching and learning that is supported by fundamental pedagogical practices in order to achieve their full learning potential (Fullan & Donnelly, 2013; Fullan & Langworthy, 2014). Pedagogy can be defined as: "any conscious activity by one person designed to enhance learning in another" (Mortimore, 1999). Digitally enriched pedagogies can be developed and implemented both in on-campus and online educational environments and often (but not always) share many elements in common. According to Pelz (2010), three main principles of effective and applied pedagogy should inform teaching on campus or online. These are as follows:

- **Principle 1:** Allow students to do (most of) the work. The more quality time students spend engaged with the content, the more they learn from the content. The instructor could provide the following strategies that could put the students in charge of their learning: (1) student-led discussions, (2) peer assistance, (3) self and peer assessment, among others.
- **Principle 2**: Interactivity resembles the heart and soul of effective synchronous and/or asynchronous learning. There should be different forms of interaction that actively involves students in learning. These forms include interacting with one another, with their instructor, with small groups, with the entire class, with the educational content, with the resources online, etc.
- **Principle 3**: This principle focuses on the concept of "presence" which is primarily discussions and responses that add value to a dialogue. These fall into one or more of three types. These are: (1) Social Presence: Students in an online course create a community of learners and engage in discussions; (2) Cognitive Presence: the degree to which the instructor and the students can create and validate meaning by continuous discourse; and (3) Teaching Presence: Cognitive and social processes are facilitated and directed by teaching presence to develop personally meaningful and educationally worthwhile learning outcomes.

Literature recommends applying constructivist learning as the best match with digitally enriched pedagogies and e-learning environments to help students achieve the course goals and learning objectives (Harman & Koohang, 2005). Constructivism is a learning theory, that enables learners to participate actively in constructing their knowledge accompanied by the integration of learner experiences (McLeod, 2019). According to (McLeod, 2019) constructivism is based on the following main principles: (1) knowledge, instead of being passively consumed, is actively constructed by the learner; (2) knowledge is created within a social context; therefore, socialization is needed; (3) knowledge is personal; therefore, each learner has a recognizable point of view depending on his/her values and current knowledge.

The Applications of Digitally Enriched Education in Higher Education

Laurillard (2020) proposed six basic learning types that instructors use in a course whether conventional, online or blended, and described how these types could be enhanced by technology. These learning types are as follows.

(1)	(2)	(3)	(4)	(5)	(6)
Acquisition	Discussion	Collaboration	Practice	Investigation	Production

1. Acquisition

- **Lecture Capture:** a recording for a classroom exercise or any educational activity is created using appropriate tools. An important tip to consider here is to have clear goals for the recorded material. The recording can be prepared before class as in a flipped classroom approach. Alternatively, a recording can be captured during an online session and then shared with students after class. Examples of tools used for lecture capturing include Camtasia Relay, CaptureSpace, Mediasite, Prezi, PowerPoint, Echo360, etc.
- **Screencasting: c**apturing and sharing a video recording or one's computer screen can sometimes be the quickest, easiest, and most effective way of sharing information. There are various screencasting software products in the marketplace, and some are even available online for free. A screencast video can be shared on YouTube, a website, or through a Learning Management System (LMS). Example of tools used for screencasting include: Apowersoft, Camstudio, Screencast-o-matic, Jing, Echo360, etc.

2. Discussion

- **Asynchronous online discussion:** Discussion boards or forums, in an online environment, are equivalent to a face-to-face class discussions or debates. The instructor can post a prompt for a question, then students can respond to the initial prompt or follow up on colleagues' posts. Discussion-board functionality is a central feature of all LMS (Blackboard, Moodle and Canvas), and communication and collaboration platform (Zoom, MS Teams and WebEx). Instructors can use this in "flipped classroom" approach or in online teaching. Students can ask questions and discuss key concepts before face-to-face class.
- **Synchronous online discussion:** Synchronous online discussions (also known as video conferences, Webinars, Zoom sessions, etc.) require that all participants engage in the activity "live". Examples of synchronous online discussion tools include MS Teams, Zoom, Skype, Blackboard Collaborate, Google Meet and Webex. The main instructional uses are to answer student's questions, engage students in collaborative work, share information and brainstorming.

3. Collaboration

Online collaboration tools aim to increase communication in and across groups to enhance learning and enable teams to work together proficiently. Additionally, they can enable the instructor to monitor and to provide feedback on team projects. Various tools and software can be used for collaborative purposes: (1) brainstorming tools (e.g., Padlet, Nearpod, Lucidspark); (2) mind mapping tools (e.g., Mindmeister, Coggle, Onenote, Mindomo); (3) collaborative editing (e.g., Google Doc, Framapad, Ms Word online, Zoho Docs); (4) resource and file sharing (e.g., Google Drive, Dropbox, iTunes U).

4. Practice

Many digitally enhanced tools are available for simulation and laboratory activities. These tools are very specific to the disciplines they are designed for. Educators who teach laboratory courses should investigate tools specific to their subjects on their own. Examples here include: SimCapture Pro and SimulationIQ, both are cloud-based tools that record, debrief and track simulation in health sciences. Other tools are available to create quizzes, tests, and surveys. Example of such tools include Google Forms, Socrative, Typeform, Survey Monkey, Quizmaker, Adobe Captivate and Quizlet.

5. Investigation

Personal Response Systems (PRS) refer to digital tools that enable interactions between instructor and students through laptops, smart phones, or tablets to solicit and display near immediate responses. Example of these tools include Iclicker, Poll Everywhere and Piazza.

6. Production

Production could involve writing individual or group assignments. Examples of writing tools include: (1) collaborative writing tools (such as Google Doc, Framapad), (2) blogs (such as Blogger, WordPress), and (3) Wikis (such as Wikipedia, PBWiki). Additionally, presentation technology applies to a variety of software and hardware that allow instructors (and students) to present materials in educational settings. Examples of presentation tools include Microsoft PowerPoint, Prezi, Apple Keynote and Google Slide.

The Learning Management System used at Qatar University

The LMS used at Qatar University is Blackboard. This platform is used to support all on-campus and online courses at the university and contains many tools that can be used by instructors to enhance students' learning. It allows instructors to disseminate class materials, help keep students informed, grade, return work, among others. Table (1) presents some of Blackboard's tools and their uses.

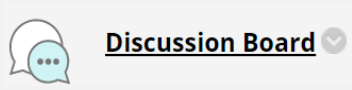
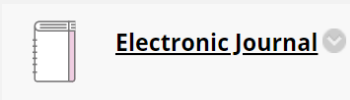
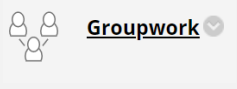
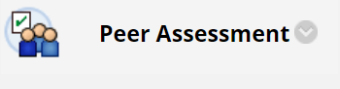
Blackboard Tool	Possible uses/ assignments
	▪ Debate and brainstorming. ▪ Instructors can ask questions to which learners can respond. ▪ Case study for discussion.
	▪ Reflective practice where students can comment on each other's writing.
	▪ A self-reflective tool that allows students to post their personal reflections about the course. ▪ Discuss and analyse course-related materials. ▪ Post their opinion related to a specific subject introduced by the instructor.
	▪ Students identify the keywords and define them. ▪ Instructor selects the keywords/concepts and presents their definitions.
	▪ Students could edit and contribute to building educational content together.
	▪ Private space for collaborative work/project, where some collaborative tools can be used.
	▪ Students evaluate each other's assignments according to an evaluation criteria grid provided by the instructor.

Table (1): Blackboard tools

Digitally Enriched Education Assessment in Higher Education

This section outlines several assessment methods that can be used in the digitally enriched classroom.

- **Open-book Examinations:** Open-book examinations attempt to assess higher-level thinking and learning skills in students. It frees them from the notion that learning is simply memorizing books, notes, or slides and then recalling that information on a test. Open-book examinations evaluate students' abilities to actively apply their knowledge and skills to more detailed questions and problems via the ability to freely access their notes, texts, or any other print or digital resource officially permitted by the instructor, during the test. Open-book evaluations can be distributed and collected via Blackboard (preferably also using Turnitin to help minimize possible plagiarism). Exams could be delivered synchronously (where all students start and end the exam at the same time) or asynchronously (where students are given several hours to complete the exam on a variable schedule).

- **Essay Questions**: Essay questions require substantial amounts of original, creative written work form the students. They are often either open-ended, where students are encouraged to formulate and express their own opinions on broad course topics or are tightly focused on a specific topic determined by the instructor. Examples of more narrowly focused essay questions are so-called document-based questions where students are given one or more documents (articles, passages of text, poems, images, etc.), and asked to analyze and interpret them according to criteria detailed by the instructor. Essay questions are usually weighted more heavily (i.e., one question is worth many points) than individual multiple-choice questions which typically carry very low weights. Essay questions can be distributed and collected via Blackboard (preferably also using Turnitin to help minimize possible plagiarism).

- **Blackboard "Automated" Tests and Quizzes:** "Automated" tests and quizzes are evaluations that are given using a LMS like Blackboard. The instructor creates individual questions and groups them into tests using the LMS, which then displays them for students to answer. Questions that can be categorized as right/wrong and multiple-choice can be graded automatically. However, complex questions requiring written responses (essays, short answers, etc.) generally require faculty to review and score them by hand through Blackboard. Obviously, students can take online tests from any location with an available internet connection. Online tests are also best taken via a desktop or laptop computer. Students should not use phones and tablets to take online tests because technical problems

may result which could severely interfere with their ability to concentrate on the tests or even to complete the test itself. Instructors that are planning to use Blackboard "automated" tests are advised to consider early planning and training as this method requires considerable preparation time. They also should familiarize students with how the on-line testing system operates by given their students one or more sample tests or quizzes prior to the final exam.

- **Publisher-Provided Automated Tests and Quizzes:** Publishers often create libraries of questions (or even entire tests) to supplement their textbooks. Instructors can use these questions to help develop their own online tests. Prepared questions can be individually selected (or omitted) and edited by the instructor to better align with their teaching style. This may not be applicable to courses which do not use e-books or books from publishers with online resources. Instructors who are planning to use publisher-provided automated tests and quizzes are advised to consider early planning and training as this method requires considerable preparation time. They also should familiarize students with how the on-line testing system operates by giving one or more sample tests or quizzes prior to the final exam.

- **Course Projects (Or Capstone Projects):** An individual or group project generally encompasses major themes or issues raised during the course. Projects create an opportunity for students to apply higher-order thinking and learning skills that include critical thinking and problem solving. Projects can be used as part of the regular coursework (perhaps substituting for a test) or, in the case of larger and more significant "capstone" projects, they can even take the place of a traditional final exam. Projects can be distributed and collected via Blackboard (preferably also using Turnitin to help minimize possible plagiarism). Students will, of course, need to complete projects over the course of several days or weeks working on their own or in groups (if permitted by the instructor). Instructors are advised to distribute clear instructions on what tools students need to use, how to use them, and how to submit their projects.

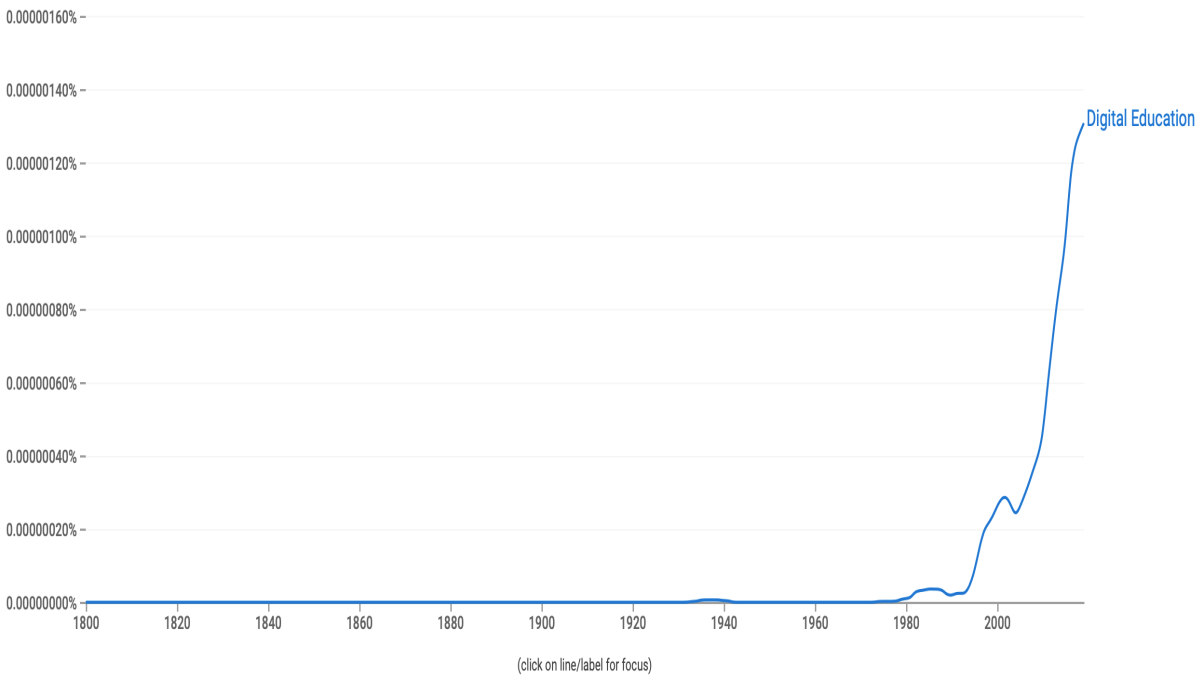
- **Debates:** Debates are discussions about a particular topic or issue in which students put forth and defend or refute supporting and opposing arguments. In this assessment method, students actively engage with and discuss their perspectives on topics and issues presented in class. Debates can be a valuable way to promote critical thinking, speaking and presentation skills. Debates can take place synchronously using video/voice conferencing products. If this method is chosen, instructors need to establish clear "ground rules" about how participation will occur and then actively moderate the

activity so that all students are not attempting to talk at once. It is strongly suggested that live debates begin with all students muted and that students "raise their hand" via features included in the meeting platform (WebEx, Collaborate, Microsoft Teams). As the moderator, the instructors will then choose who gets to speak when and for how long. Importantly, debates do not always need to occur synchronously, live, in "real time". It is possible to conduct an extended, thoughtful "conversation" over several hours (or even days) online via text-based "Discussion Forums" in Blackboard.

- **Student Presentations:** Student presentations involve students using their voice along with any visual aids needed (PowerPoint, real-world objects, posters, etc.) to explain and clarify one or more topics to an audience. Similar to debates and projects, student presentations are often an excellent way for faculty to "step aside" from a teacher-centric role in the classroom and create more student-centered approaches to teaching and learning. Presentations can give students important opportunities to actively process knowledge, attend to what others are thinking and better understand and formulate their own opinions. Presentations can be delivered “live” online (WebEx, Collaborate, Microsoft Teams) or recorded and then uploaded to Blackboard or YouTube as a "narrated PowerPoint" presentation. Faculty are advised to distribute clear rubrics and instructions on what tools students need to use, how to use them and how to submit their final presentations.

- **Student Portfolios:** A portfolio consists of samples of student's work from the semester collected and assembled as evidence to show how the students have met specified learning outcomes or assessment criteria. A portfolio can include a wide variety of items from the semester (written work, journals, drawings, diagrams, tests, projects, etc.) as well as student reflections on their own development as learners during the semester. Portfolios can help students better analyze and evaluate their own thought processes and work habits. As a non-traditional form of assessment, portfolios can often better interest and engage student interest, effort, and creativity. Student Portfolios can be distributed and collected via Blackboard (preferably using Turnitin if the portfolio contents are written words). Email submission can also be used. Instructors are advised to distribute clear instructions on what tools students need to use, how to use them and how to submit their final portfolio projects.

A Google Ngram Reader Search of the Term Digital Education



References

ECDL. (2014). The Fallacy of the 'Digital Native': Why Young People Need to Develop their Digital Skills. Retrieved from https://ec.europa.eu/futurium/en/system/files/ged/the_fallacy_of_the_digitalnative_-_ecdl_foundation.pdf

Fullan, M., & Donnelly, K. (2013). Alive in the swamp: Assessing digital innovations in education: Nesta.

Fullan, M., & Langworthy, M. (2014). A rich seam: How new pedagogies find deep learning: MaRS Discovery District.

Harman, K., & Koohang, A. (2005). Discussion board: A learning object. *Interdisciplinary journal of e-learning and learning objects*, 1(1), 67-77.

Koohang, A., Riley, L., Smith, T., and Schreurs, J. (2009). E-learning and constructivism: From theory to application. Interdisciplinary Journal of E-Learning and Learning Objects, 5(1), 91-109.

Laurillard, D. (Producer). (2020, 20-1-2020). Learning types and learning technologies. [video] Retrieved from https://mediacentral.ucl.ac.uk/Play/4369

McLaughlin, C. (2018). What is digital education? Retrieved from https://www.schoology.com/blog/digital-learning

McLeod, S. (2019). Constructivism as a theory for teaching and learning. Simply psychology. Retrieved from https://www.simplypsychology.org/constructivism.html

Mortimore, P. (1999). Understanding pedagogy: and its impact on learning: Sage.

Pelz, B. (2010). (My) three principles of effective online pedagogy. *Journal of Asynchronous Learning Networks,* 14(1), 103-116.

Qatar University Strategy 2018-2022 From Reform to Transformation. (2018). Retrieved from: http://www.qu.edu.qa/static_file/qu/about/documents/Qatar%20University%20Strategy%202018-2022%20Booklet%20-%20EN.pdf

Rampelt, F., Orr, D., Knoth, A. (2019). Bologna Digital 2020 - White Paper on Digitalisation in the European Higher Education Area.

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