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Advancing Higher Education in Maldives Through E-learning Development

D1.2 Success stories

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Executive summary

Several overarching themes related to innovative practices and original approaches to teaching emerged from the selected institutional examples across EU and World. These are described in this chapter, with particularly inspiring examples highlighted for each theme.

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Document summary

This summary provides a quick glance on the concepts described in following sections. Only the main idea of each section is provided very briefly in bullet points under this section title. To find out more about a particular section, click section title to quickly jump to that section content.

This chapter consists of several sections, each describing a particular innovative practice or original approach to teaching:

- Active learning
  - The process where students engage in activities that promote analysis, synthesis and evaluation of class content.
  - It can be achieved through a variety of approaches, for example learner-generated content, gamification and problem-based learning.
  - Examples: PeerWise tool at University of Edinburgh (UK), Creators project at University of Southampton's (UK), gamified courses at The Delft University of Technology (Netherlands), SustainabilityConnect tool at Arizona State University (USA).
- Beyond the institutional Learning Management System
  - Enhancement of the educational experience beyond the online learning management system (LMS), e.g. using remote labs –physical laboratories where the equipment can be operated remotely.
  - Examples: Open Science Laboratory by the Open University (UK), Augmented Remote Lab by Universidad de Huelva (Spain).
- Collaboration between higher education institutions
  - International cooperation includes academic partnerships, encouragement with national authorities to provide funding to meet infrastructure needs, teacher training and programme delivery.
  - Many HE institutions are carrying out joint work to foster effective learning and teaching with goal to design, develop and deliver high quality courses and materials.
  - Benefits include improving provision through the sharing and joint development of resources and courses (OERs, MOOCs), benchmarking practices, increasing the offer of staff development opportunities and enhancing student exchanges.
  - Examples: Erasmus programme (EU), Open Universities Australia (OUA) consortium, BC campus (Canada).
- Digital literacy
  - Today, digital skills are needed by all citizens for full and meaningful participation in a modern society, and without these skills, individuals or groups are in danger of social exclusion.
  - These skills in students and teachers can enable the appropriate use of learning technologies, leading to improvements in course effectiveness and the enhancement of the learning experience.
  - Example: DIGCOMP - European framework for digital competences.
- Flexibility and personalization

  - Individual students can choose how, when and where they learn.
  - Includes the use of learning analytics or the use of adaptive learning technologies to cater for the needs of individual students.
  - Different target groups can have varying degrees of access to learning activities, resources and services.
  - Students can study modules of their choice from within the institution or at other universities in the world or MOOCs and have this learning credited towards their overall degree award.
  - Examples: The Open University (Netherlands), iMBA degree by the University of Illinois, Open Universities Australia, FlexPath by Capella University (USA)
- Learning analytics
  - The educational use of Web analytics and other student activity data: the measurement, collection, analysis and reporting of data about learners and their contexts, to understand and optimize learning environments.
  - Enables adaptive learning - software and online platforms that adjust to individual students' needs as they learn.
  - Shows students how they compare to others in their course and helps them stay on-track with their studies.
  - Examples: The student dashboard at Nottingham Trent University (UK), The University of Michigan's (USA) E^2Coach, Predictive analytics at Georgia State University (USA).
- Recognition of prior learning (PLAR)
  - The evaluation and acknowledgment of learning that occurs outside of formal credit awarding training and educational programs based on evidences (testimonials and references, listing of past achievements, authored monographs, journal articles, speech notes etc.) provided by learners.
  - Examples: Otago Polytechnic (New Zealand), Strayer University (USA), PLAR at Athabasca University (Canada).
- Teaching enhancement programmes
  - Continuous teacher development opportunities are crucial to keeping higher education institution up to date with new technologies, trends and competences, and can lead to improved quality of teaching practice.
  - Examples: project #1minuteCPD at Manchester Metropolitan University, Teacher Learning Journeys by Penn State University (USA).
- Open Education
  - Includes providing open access to content, courses, support, assessment and certification in ways that are flexible, and accommodate learners' diverse needs.
  - Gives learners the opportunity to gain new or enhance existing skills at a lower or no cost, in a flexible and convenient way, supports the modernization of higher education using ICT and enables connecting of formal and non-formal education.
  - There are many types of open education: *Free of charge online courses* (Bavarian Virtual University, Germany), *Open courseware* (University of Valencia, Spain), *MOOC platforms* (European Multiple MOOC Aggregator), *MOOC collaboration* (OpenupEd project), *Open Educational Resources* (Open AGH e-textbooks, Poland), *Open access publishing* (Electronic library, Brno University of Technology, Czech Republic; The

Austrian Science Fund – FWF, Austria), *Open research data* (OpenAire), *online courses in form of blogs* (EduFeedr,Talinn University, Estonia):

- Other successful implementations of e-learning
  - Saudi e-University - establishment of a National Centre for eLearning and Distance Learning (NCeL) and e-learning Deanships in almost all universities with figure of the Dean as a leader.
  - University of Petroleum and Energy Studies in India – a two-year experiment in digitizing teaching and learning processes using current IT infrastructure and dedicated teams to develop learning modules in house for selected seven subjects.
  - FUTURA project - a five-part IDEAS (Intelligent, Distributed, Engaging, Agile and Situated) framework for describing next-generation pedagogy developed by Universitat Oberta de Catalunya (UOC).
  - The Open Learning Initiative: Enacting Instruction Online - a team of content experts, learning scientists, human-computer interaction experts, and software engineers addressed specific 5 challenges identified with traditional instruction.
  - Going the Distance: Outsourcing Online Learning - University of Southern California (USA) outsourced the development and delivery of fully online, Internet-delivered degrees to for-profit vendor partners.
  - Blended Learning and New Education Logistics in Northern Sweden – blended learning using ICT enabled education in sparsely populated areas.
  - Kansas State University: Creating a Virtual Faculty Consortium - virtual faculty (a faculty made of faculty members teaching in a set of academically similar institutions) allows the institutions to deliver the new degree via the Internet (Great Plains IDEA, USA).
  - The Indiana University eTexts Initiative - providing textbooks in electronic format using university approved tablets in agreement with publishers significantly lowered students costs of purchasing learning materials.
  - The Changing Pedagogical Landscape - the study identified key recommendations on new modes of teaching and learning, including university strategies for digital education, implementation of new modes of teaching, recommendations for teaching staff and recommendations for governmental policies.
  - Implementing a university e-learning strategy: levers for change within academic schools - implementation of an e-learning strategy at Oxford Brookes University (UK) in terms of the levers used to promote effective uptake and ensure sustainable embedding of the strategy.

1. Active learning

Active learning is the process whereby students engage in activities that promote analysis, synthesis and evaluation of class content (Center for Research on Learning and Teaching, 2016). The term can be used "to embrace almost any learning activity which involves the active participation of the student" (UK Centre for Materials Education, HEA, n.d.). Active learning aligns with the idea that "we should change the university from a place where knowledge learned outside the classroom is reported to students, to one where students themselves directly experience having a hand in creating knowledge" (King & Sen, 2013, p.88). It can be achieved through a variety of approaches, for example learner-generated content, gamification and problem-based learning.

Facilitating the development of learner-generated content is one way in which learning can be made more active. At the University of Edinburgh (UK), students use PeerWise[1], a freely available online tool, to create multiple-choice questions and associated explanations for their peers. They can answer each other's questions, provide comments, rate contributions, seek help from authors, and follow their favourite contributors. A positive association has been found between students' participation in PeerWise and their mark in the final course examination (Bates, Hardy, Kay, Galloway, McQueen, & Kirsop, 2012). In the University of Southampton's (UK) Students as Creators project, students help academic staff to source suitable online platforms for specific purposes (e.g. blogging platforms). They evaluate free web-based apps that could be used by all students to manage their learning, and curate Web-based content relevant to the module. In another learner-generated content initiative, students in an ICT Competences course at the Universitat Oberta de Catalunya developed open educational resources (OERs), which were made available for public reuse (Pérez-Mateo, Maina, Guitert, & Romero, 2011).

Gamification, the implementation of game mechanics into a non-gaming task to encourage and motivate people to either carry out that task, execute it more quickly, or produce higher quality results (Jisc, 2016b), can also help to increase student engagement in courses. The Delft University of Technology in the Netherlands offers a successful example of this. They gamified two courses, which had a total enrolment of 450 students. Gamification was found to correlate with better grades and greater participation (Iosup & Epema, 2013).

Problem-based learning is a teaching approach that challenges students to learn through engaging with a real problem. It places students in the active role of problem-solvers confronted with an ill- structured situation that usually simulates the kind of problems they are likely to face as employees or future employees in complex organizations. Project- and problem-based learning (PPBL) takes this one step further: in this approach, students gain knowledge and skills by working for an extended period of time to investigate and respond to an engaging and complex question, problem or challenge.

In the examples discussed here, active learning is closely tied to a constructivist approach to curriculum design, in which learners are expected to actively construct new ideas or concepts, to take responsibility for their own learning, and to learn through critical analysis and problem solving, often by collaborating with peers or professionals outside of the institution.

Inspiring Example: Sustainability Connect by Arizona State University (USA)

[1] https://peerwise.cs.auckland.ac.nz/

SustainabilityConnect is an online platform that helps initialize, coordinate and document problem- and project-based learning (PPBL) projects on real-world sustainability challenges. The goal is to foster collaboration between academic and professional experts while providing students with an applied learning environment. Key benefits of this initiative for students include connecting to people, opportunities and projects, and obtaining support to build sustainability skills, or to frame and initiate a project. Projects begin with an idea or need for change. A project coordinator then works with the initiator to develop the proposal and structure it. The coordinator assists in building a team of students and experts in the field, being careful to match academic and professional experts who complement each other's knowledge and expertise. The coordinator then facilitates the progress of the project, where students conduct the majority of the work with academic and professional guidance. At the completion of each project, the students complete a report detailing the results. This document is uploaded to a database where other users can view it and find inspiration for future research. Any student, faculty, staff or community partner of the university can submit a project proposal or search the project database. The project platform serves as an institutional coordination mechanism.

Further information:

> https://sustainabilityconnect.asu.edu/

2. Beyond the institutional Learning Management System

Current practices at some institutions point towards the enhancement of the educational experience beyond the online learning management system (LMS). Remote labs – real, physical laboratories where the equipment can be operated remotely – offer an interesting possibility. For example, the Open Science Laboratory[2] by the Open University in the UK brings interactive practical science to students anywhere and anytime. It features investigations based on on-screen instruments, remote access experiments and virtual scenarios using real data. Several activities are available to all, while others are available only to registered users.

Inspiring Example: Augmented Remote Lab by Universidad de Huelva (Spain)

The Universidad de Huelva's Augmented Remote Lab (ARL) aims to amalgamate the best features of remote labs (real, physical, laboratories where the equipment can be operated remotely) and virtual labs (entirely computer-generated laboratories, accessed via a PC), in a course aimed at industrial and computer engineering students. The project consists of two regular remote labs that the students view using cameras. Where an operation in the remote lab would require a human operator, the view from the camera is modified to make it look as though the operation has taken place, even though it has not. In addition, remote equipment in the lab is given input that matches the non-existent operation so that it functions appropriately. Thus, students experience the illusion of a fully functioning lab without the expense and logistical difficulties involved in accessing a physical one. While the ARL is a small-scale, simplified project, it demonstrates the principle of incorporating virtual elements into

[2] https://learn5.open.ac.uk/course/view.php?id=2

remote lab working. The principle may be applied to more complex laboratory situations, where some operations are not feasible, either due to cost or the requirement to have a human operator present (Mejías Borrero & Andújar Márquez, 2012).

Further information:

> https://www.youtube.com/watch?v=4myvgl4Losc

Further discussion about moving beyond the institutional LMS may be found in the study by Merriman, Coppeto, Santanach, Shaw and Aracil (2016) on next-generation learning architecture, which complements this report. They point out that an LMS is a basic, isolated system for supporting the rudimentary functions of online education, and warn against continuing to invest in developing educational delivery systems based upon such a rigid architecture. They argue that new kinds of software architecture are needed to support more sophisticated features of online education such as the development of personalized learning pathways, new forms of assessment and accreditation, and new business models. They envisage a new architecture for educational delivery – it should be seamlessly integrated into institutional systems for student data, human resources and financial management, enabling more effective collection and use of analytics in educational decision making. They also argue that the new software architecture should be able to incorporate and customize educational applications (tools, systems and content) from an ever- growing marketplace, based on openly published service specifications. The key concept in their proposed software architecture is integration: “Integration is an essential principle to allow these applications to work together effectively to meet the evolving needs of teachers, students and institutional leadership while offering more meaningful support for diverse and advanced teaching and learning methodologies” (Merriman et al, 2016, p.5).

3. Collaboration between higher education institutions

Europe’s strategy for international cooperation focuses on developing academic partnerships, and includes encouragement with national authorities to provide funding for collaboration to meet infrastructure needs, teacher training and programme delivery (High Level Group on the Modernisation of Higher Education, 2014). Many HE institutions are, thus, carrying out joint work to foster effective learning and teaching. The Erasmus programme[3] is a good example of such partnerships, which are based on formal agreements between institutions. Benefits of inter-institutional collaboration include improving provision through the sharing and joint development of resources and courses, benchmarking practices, increasing the offer of staff development opportunities and enhancing student exchanges. Collaboration can enhance student exchanges and promote the emergence of joint postgraduate degree programmes. Universities can also find value in the creation of networks for developing open educational resources (OERs), massive open online courses (MOOCs), and regular credit-bearing online courses (Mapstone, Buitendijk, & Wiberg, 2014), as these networks can contribute to the institutional capacity to design, develop and deliver high quality courses and materials.

[3] http://www.erasmusprogramme.com/

Effective collaboration between universities is exemplified by Open Universities Australia (OUA)[4]. OUA is a consortium of seven shareholder universities, and six other universities, which aims to identify, develop and deliver new and innovative learning and tertiary educational opportunities to Australian students. These partners offer a range of fee-based courses through OUA. Their offerings are structured as Pathways, in which students first select a study area (business, education, engineering, health, humanities, science or social science) and then receive a recommendation of four related units that can lead to one or more full degrees in one of the participating universities. Student assistance services include preparatory units, career advice, crisis support counselling and exam supervision.

Inspiring Example: BCcampus (Canada)

BCcampus was established in 2002 to provide a Web-based portal to collaborative online learning programmes and services across the British Columbia (BC) post-secondary system. It assists students, educators, and institutions, by identifying, obtaining, developing and implementing technologies and services that enhance online learning. Students can access a number of online services, such as a quick-response, online application service for all public post-secondary institutions, a directory of online programmes and courses, and online library services across multiple institutions. Staff can access online community forums, best practices research, and technological infrastructure and support for course development and delivery. Other services include a repository of reusable educational resources and courses, a funding programme for the development of educational resources and access to shared online delivery tools. BCcampus also administers an online programme development fund, explores and develops shared services, and provides professional development and training, including workshops on facilitating learning online.

Further information:

> http://bccampus.ca/faq/#1

4. Digital literacy

The concept of digital literacy – also known as digital competences – refers to the skills required by both staff and students for academic and professional activities supported by diverse and changing technologies (Jisc, 2014). These skills can enable the appropriate use of learning technologies, leading to improvements in course effectiveness and the enhancement of the learning experience (High Level Group on the Modernisation of Higher Education, 2014). In today's society, citizens require a set of competences related to the use of ICT, referred to as digital skills, e-skills, digital competence, digital literacy, or even life skills (Bawden, 2008). As social interaction – including interaction with services and institutions – is ever more dependent on technology, being digitally competent is a requirement and a right (OECD, 2001). Digital skills are needed by all citizens for full and meaningful participation in a modern society, and without these skills, individuals or groups are in danger of social exclusion. However, 60% of students never use digital technologies in their classroom (European Commission, 2016). Training of teachers and students is required to support digital literacy, incorporate learning technologies into their practices, improve course effectiveness and enhance the learning experience (Dahlstrom & Brooks, 2014; Johnson, Adams

[4] https://www.open.edu.au/about-us/

Becker, Estrada, & Freeman, 2015; High Level Group on the Modernisation of Higher Education, 2014). Currently the European Commission (2016) is promoting initiatives aimed at increasing training in digital skills, and harnessing technologies for the recognition and validation of skills, while also developing policy and supporting related research.

Inspiring Example: DIGCOMP

The DIGCOMP framework is a common European digital competence framework for citizens, which can help address the need for students and staff to develop digital competences (European Commission, Joint Research Centre, 2016). The DIGCOMP framework is comprised of the following five dimensions: information processing, communication, content creation, safety, and problem solving. It includes an assessment tool as part of the Europass CV that enables the validation of an individual's digital competences (European Union, 2002-2016). Various EU Member States are using the DIGCOMP Framework and related assessment tool in their educational reforms. For example, in Estonia, Lithuania, Croatia and Spain it is being used to support teacher training, and in Andalucia (Spain) it is being used to support job seekers access suitable learning resources. DIGCOMP is also being used in two cross-European initiatives – Skillage, which assesses individuals' understanding of ICT in an employment context, and Carer+, which is aimed at supporting the professional development of care workers.

Further information:

> https://ec.europa.eu/jrc/en/digcomp/implementation

5. Flexibility and personalization

In flexible and personalized learning, individual students can choose how, when and where they learn, which can be empowering and motivating. This approach fosters equal opportunities for learners with wide-ranging goals. Flexible and personalized learning initiatives may include the use of learning analytics or the use of adaptive learning technologies to cater for the needs of individual students. Managing such course provision requires complex logistics, and there is currently an unsatisfied demand for this type of learning (Hermans, Janssen, Vogten, & Koper, 2015; Johnson et al., 2015).

The Open University (Netherlands) has created a flexible provisioning system that fosters online learning flexibility and personalization (Hermans et al., 2015). The system supports a high level of granularity in enabling access to courses, depending on one's registration status, with the following options of roles available to users: students, self-directed learners, prospects and explorers. These different target groups have varying degrees of access to learning activities, resources and services. For example, self-directed learners can access all course resources relevant to their domain and are supplied with personal tools for managing their progress, while regular students can also obtain tutor guidance and take exams.

The Open University in the Netherlands is also trailing flexibly structured Bachelor and Master programmes, where students are given a certain number of "free" credits to use as they desire (A. Lansu, personal communication, October 30, 2015). Students can study modules of their choice from within the institution or at other universities in the Netherlands or elsewhere in the world – with permission – and have this learning credited towards their overall

degree award. This approach also potentially allows learners to incorporate credits achieved from MOOCs taken at other institutions into their degree.

The University of Illinois' iMBA[5] degree is designed as a 'stackable degree' and delivered in a flexible online format. It is constructed as a set of stand-alone building blocks that can be combined to comprise a full MBA degree. To earn the degree, learners must complete six specializations and a programme-wide experiential learning course. The basic content of courses from the iMBA curriculum is available on the Coursera MOOC platform for free (Koller, 2015). Students can try out a free MOOC, or enrol for low-cost specializations. Course credits earned can be accumulated towards the iMBA if learners decide to apply later. Performance in the specializations is considered for student admittance, not just test scores and past transcripts, allowing a much larger pool of prospective students the chance to enrol. This fully online MBA costs less than a third of the cost of MBAs from institutions with similar stature.

Open Universities Australia offers students flexible, timely support through a partnership with an online tutoring service which provides advice to students from qualified tutors around the clock. Students can connect on demand with an expert tutor for a virtual drop-in session 24 hours a day, submit a piece of writing for detailed review or general feedback, or ask a question. A correlation has been found between students who use this service and those who achieve Distinction and High Distinction results (Ashford-Rowe & Howarth, 2011; Stone, Hewitt & Morelli, 2013).

Inspiring Example: FlexPath by Capella University (USA)

FlexPath is a self-paced, competency-based education format that enables students to earn their degree in a flexible and personalized way. Students can take a FlexPath self-assessment to decide if self-paced learning is right for them. They pay one flat tuition rate every 12 weeks, and can take up to two courses at a time. The faster their pace, the sooner they can complete their degree and the more money they save. Nevertheless, some students choose to complete only one course per quarter, suggesting that they value the flexibility of scheduling their own learning. Assessments simulate on-the-job work. FlexPath does not factor in grades, credits accumulated or time spent in a classroom. Instead, students receive feedback from faculty as to how well they demonstrated their skills in their assessment. Students have tutors who are subject matter experts. Coaches provide one-to-one support for students to stay on track and answer programme-related questions. Students can track their academic progress in real time through the use of a student dashboard called Competency Map. Between August 2013, when FlexPath was launched, and March 2015, 1,000 adult learners were enrolled and more than 50 had graduated. Most FlexPath students (90%) have indicated that they are satisfied with the overall programme (Grann, 2015).

Further information:

> http://www.capella.edu/flexpath/what-is-flexpath/

6. Learning analytics

[5] https://onlinemba.illinois.edu/

Learning analytics is the educational use of Web analytics and other student activity data. The concept refers to "the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs" (Siemens, 2010). In a virtual learning environment, this data can include the learning resources accessed, the time and date of access, and the actions undertaken (e.g., viewing, adding, updating or deleting items), as well as grades and library use. Data from learning analytics offers insights into student progress, engagement and interaction with online course materials and learning environments. Sharing this information with learners can empower them to take a more active part in their learning (Dahlstrom & Brooks, 2014; High Level Group on the Modernisation of Higher Education, 2014; Johnson et al., 2015; Sharples, Adams, Ferguson, Gaved, McAndrew, Rienties, Weller & Whitelock, 2014).

Analytics can guide decisions on support and feedback for students; for example, by:

- Automatically sending emails to those who veer off track in their studies
- Preventing off-track students from enrolling in a new course until they have contacted an institutional representative (tutor, coach or advisor) and discussed strategies for getting back on track
- Showing students how they compare to others in their course
- Providing live updates that students can use to check how well they are progressing.

Learning analytics can also enable the setting up of adaptive learning - software and online platforms that adjust to individual students' needs as they learn.

There are a number of institutional examples of successful use of learning analytics in practice. The student dashboard at Nottingham Trent University[6] in the UK provides students and tutors with information on activities such as library use, class attendance, use of the institutional online workspace, and academic grades. It uses this data to calculate the mean engagement rating for everyone on a course and in a year, compares each student's engagement to the course mean and generates a rating, from low to high, for each student on each measure. The dashboard is intended to help students take responsibility for their own learning and develop skills such as time management and organization. When surveyed, most tutors (80%) felt that the data provided by the dashboard changed how they worked with students and enabled them to offer better targeted teaching interventions. Over a quarter of students (27%) reported that they had changed their behavior in response to the data provided by the dashboard (e.g., increased attendance at lectures or increased their use of the library) (Foster, 2015).

The University of Michigan's (USA) E^{2}Coach[7] is a Web application that provides each student with an individualized electronic "coach" that draws data from various sources, including student surveys at the beginning of the course, and exam grades. It is built on an open-source software system. Messages sent to students' address course content, advise on study methods, offer reminders, present data graphics, and direct students to support services. Normative information is also presented to show students how the time they spend on exam study and the effort they put in on homework compares to the rest of the class and to students who perform at the level they aim to achieve. Feedback from active users has been positive; for example: "It makes things easier… when you have people giving you pointers on how to study, how to succeed in the course, things to look out for, and such" (Next Gen Learning Blog, 2013).

[6] http://www.ntu.ac.uk/current_students/studying/student_dashboard/index.html
[7] http://sitemaker.umich.edu/ecoach/about_ecoach

Inspiring Example: Predictive analytics at Georgia State University (USA)

Georgia State University uses predictive analytics to determine how to distribute its financial aid for students, focusing on those who have the potential to achieve the most with extra economic help. Algorithms help identify the courses with the most failing grades and withdrawals, and enable the university to be proactive in its interventions for at-risk students. Students who are on financial aid and perform well in those classes are awarded mini-grants to be peer tutors for the semester after they complete the course. Average grades in courses with peer tutors has risen. This initiative has helped Georgia State University increase semester-to-semester retention rates by 5% with 1,200 more students than before continuing their studies every year, and reduce time-to-degree for graduating students by almost half a semester.

Further information:

> http://www.theuia.org/sites/default/files/UIA_predictive_onepagers.pdf

7. Recognition of prior learning

Recognition of prior learning (RPL), also called prior learning accreditation and recognition (PLAR) refers to the evaluation and acknowledgment of learning that occurs outside of formal credit awarding training and educational programs (Spencer, n.d.). Students who want to be given recognition for their prior learning are required to provide evidence of that learning to the institution – and this usually comes from a much wider range of sources than participation in formal courses, although it may include that. For example, at Otago Polytechnic in New Zealand, evidence may include one or more of:

- testimonials and references from appropriately experienced referees, covering specific areas of inquiry for which further documentation may be required
- listing of past achievements and the learning sequences that were essential to their successful completion
- production of monographs, journal articles, speech notes and so on that you have authored.

Strayer University[8] in the USA offers a wide range of assessment options for college-level credit. It seeks to recognize the value of previous experiences by not only transferring credits from allied, accredited universities and colleges, but also by recognizing certain professional certifications and licenses, transcripts or other documentation of corporate training. Other assessment possibilities include low-cost exams, such as the College Level Examination Programme (CLEP) for liberal arts and business, DSST for on-the-job training, professional development and other life experiences, and Strayer Challenge Exams, which are similar to final exams but available to students who have not taken the course.

RPL/PLAR facilitates a widening of participation in higher education as it enables non-traditional students to enter the system – these students may be mature adults with family and job commitments, who have obtained skills and

[8] http://www.strayer.edu/admissions/credit-by-exam

competences through life experiences or part-time study. RPL/PLAR programmes are often accompanied by flexible, customized learning pathways for subsequent study.

Inspiring Example: PLAR at Athabasca University (Canada)

At Athabasca University in Canada, the prior learning and assessment recognition (PLAR) process rests on the underlying principles that learners possess knowledge related to the program, that they know and are able to apply theories and concepts used in that program, that they can carry out analysis using data, theories and concepts, and that they can present knowledge clearly at a university level. PLAR applicants at Athabasca are supported by university staff in preparing their portfolio submissions.

Further information:

> http://priorlearning.athabascau.ca/what-is-plar.php

8. Teaching enhancement programmes

Rapidly changing demands in higher education require faculty to constantly keep up to date with new technologies, trends and competences. Continuous teacher development opportunities are thus crucial (European Commission, 2012), and can lead to improved quality of teaching practice (Dahlstrom & Brooks, 2014; High Level Group on the Modernisation of Higher Education, 2013).

Fitting teacher development programmes into academics' schedules and ensuring that the programmes are relevant to staff with wide-ranging expertise and skill sets can be a challenge. At Manchester Metropolitan University, the project #1minuteCPD[9] was set up to provide resources for continuous professional development of academic staff in a highly time-efficient, flexible way. A series of resources were produced that can be watched, tried or read in a minute. The resources are hosted on a blog which is shared openly through social media and within the university. According to their website, the aim is to improve academic's digital skills, "one minute at a time, one day at a time". The project is promoted internally through a weekly newsletter with information on technology-enhanced learning. The access numbers of the blog are much higher than attendance at face-to-face staff development sessions.[10]

Inspiring Example: Teacher Learning Journeys by Penn State University (USA)

Teacher Learning Journeys (TLJ) was created as a partnership project between Penn State University, National Aeronautics & Space Administration (NASA) and the National Science Teachers Association in the USA. It is a badging system aimed at supporting personalized professional development for science, technology, engineering and mathematics (STEM) teachers. This approach allows teachers to customize their professional development to their workplace, expertise and

[9] https://1minutecpd.wordpress.com/
[10] https://altc.alt.ac.uk/blog/2016/02/5459/

interests. A travel metaphor is used to help teachers find, select, reflect on, implement, and get recognition for learning activities. After completing each activity, teachers can receive digital stamps and badges which store information about their achievements. TLJ offers digital badging as one solution for personalization to meet the needs of workers and employers, as an extension of workplace learning to include independent study, and as a credential to assess professional development. Teachers can create a portfolio that they can share with administrators and peers. Since many teachers found the project useful, the site has remained available since the completion of the project, and is now being run by volunteers (Gamrat, Zimmerman, Dudek, & Peck, 2014).

Further information:

> http://learning-interfaces.com/tlj/

The examples of innovative practices and original approaches to teaching described in this section provide pointers towards next-generation pedagogy.

9. Open Education

Open education includes opening up of educational materials under an open license and the availability of open access research in repositories. Using open education every individual, at any stage in his life, can have appropriate educational opportunities available to him. This includes access to content, courses, support, assessment and certification in ways that are flexible, and accommodate their diverse needs. Lifelong learning via open education is expected to be a route for enhancing individuals' employability. (Inamorato dos Santos, Punie, Castaño Muñoz, 2016)

Open education:

- gives learners the opportunity to gain new skills or enhance existing skills at a lower or no cost, in a flexible and convenient way,
- supports the modernization of higher education, since it's carried out using digital technologies,
- enables connecting of formal and non-formal education.

There are many ways of offering open education to a wide audience:

- *Free of charge online courses* - course materials are made available to audience via an online platform, along with a tutoring service and assessment. Small fee may be required for external students or for a certificate of completion. Example: Bavarian Virtual University (BVU), Germany.
- *Open courseware* – course materials are provided free of charge to university students in addition to classroom materials and also for self-learning students from other universities. Courses provide basic introductory insights into a certain topic and target a broad audience without tutoring. Certification is not provided. Example: University of Valencia, Spain.
- *MOOC platforms* – courses provide not only OER but also discussion fora, quizzes, tests, assignments and tutoring. Testing is also available, typically in testing centres. Participants can get attainment certificates from the universities which deliver the courses. Example: European Multiple MOOC Aggregator (EMMA)

- *MOOC collaboration* – usually include several partner universities. Each university can choose what platform to use. There are no formal entry requirements and courses are free of charge. Courses include video sequences, scripts and other learning tools. Participants can communicate using social networks and fora. MOOC collaboration may include both online and onsite parts. Example: OpenupEd
- *Open Educational Resources (OER)* – educational materials (e-textbooks, video, audio) are provided in an online repository free and open to anyone. In some OERs, materials are free to be adapted for the local context (language, learning/teaching needs, culture etc.), updated and put back to the OER. Usually, there are no recognition of learning achievements (certification or credits). Example: Open AGH e-textbooks, Poland
- *Open access publishing* – document repository provides creation, administration and long-term preservation of digital collections. It provides full-text indexing and retrieval of documents and capability to upload digital objects in bulk, including descriptive files. This can be an initiative at institutional (Example: Electronic library, Brno University of Technology, Czech Republic) or national level (Example: The Austrian Science Fund – FWF, Austria).
- *Open research data* – repository for data needed to validate results presented in scientific publications. Projects are required to deposit their research data and enable third parties to access, mine, exploit, reproduce and disseminate their data. Example: OpenAire.
- *New technologies for open education* – an example is EduFeedr, Talinn University, Estonia - an online environment for managing and following open online courses in form of blogs. Only facilitator needs a user account to set up the course. Anybody can view blog posts and comments without logging in. EduFeedr provides tools for managing learning activities and visualizing learner progress.

In order for open education practices to become a strong tool for social and economic development, there needs to be a strategic opening up of education by higher education institutions.

OpenEdu framework is the final outcome of the OpenEdu project carried out by IPTS (2013-2015). The framework provides a vision of how open education can help higher educations improve their educational provision. The OpenEdu framework was based on four IPTS case studies: OpenCred[11], OpenCases[12], MOOCknowledge[13] and OpenSurvey[14] 8.

The OpenEdu framework for higher education institutions presents 10 dimensions for opening up education divided into two categories (Inamorato dos Santos, Punie, Castaño Muñoz, 2016):

- core dimensions – the 'what' of open education:
    - access - removal or lowering of economic, technological, geographical and institutional barriers to knowledge.
    - content - materials for teaching and learning, and research outputs.

[11] Witthaus, G., Inamorato dos Santos, A., Childs, M., Tannhäuser, A., Conole, G., Nkuyubwatsi, B., Punie, Y. (2016) Validation of Non-formal MOOC-based Learning: An Analysis of Assessment and Recognition Practices in Europe (OpenCred). Luxembourg: Publications Offices of the European Union.
[12] Souto-Otero, M., Inamorato dos Santos, A., Shields, R., Castaño-Muñoz, J., Devaux, A., Oberheidt, S., Punie, Y. (2016) OpenCases: Case Studies on Openness in Education. Luxembourg: Publications Offices of the European Union
[13] Kalz M., Kreijns K., Niellisen G., Castaño-Muñoz J., Guasch T., Espasa A., Floratos N., Tovar E., Cabedo R. (2015.) MOOCKnowledge: Establishing a large-scale data-collection about participants of European Open Online Courses, EADTU, March 2015. pg 114-119
[14] Castaño-Muñoz, J., Punie, Y., Inamorato dos Santos, A., Mitic, M., Morais, R. (2016) How Are Higher Education Institutions Dealing with Openness? A Survey of Practices, Beliefs, and Strategies in Five European Countries. Luxembourg: Publications Office of the European Union

- pedagogy - use of technology to broaden pedagogical approaches and make the range of teaching and learning practices more transparent, shareable and visible.
- recognition - the process of formally acknowledging and accepting credentials, such as a badge, a certificate, a diploma or title issued by an accredited institution. These credentials should attest that a set of learning outcomes achieved by an individual has been assessed by a competent body against a predefined standard.
- collaboration - connecting individuals and institutions using the exchange of practices and resources aiming to improve education.
- research - providing access to data and research outputs, and broadening participation in research

- transversal dimensions – `how' to achieve it:
  - strategy - defining values, commitments, opportunities, resources and capabilities of a higher education institution with respect to opening up education
  - technology - technical infrastructure and software that facilitate opening up education
  - quality - efficacy, impact, availability, accuracy and excellence of an institutions open education offer
  - leadership - promotion of sustainable open education activities and initiatives via a transparent approach.

Each dimension interrelates with all the others and allows for different degrees of openness.

Inspiring Example: UNINETTUNO (Università Telematica Internazionale), Italy

Università Telematica Internazionale (UNINETTUNO) based in Italy was established in 2005 as a public distance teaching and learning university - as part of Mediterranean Network of Universities project which has 31 partners from 11 Mediterranean countries. UNINETTUNO was created from NETTUNO, a consortium of 43 Italian and foreign public universities.

Their platform offers courses available to international audience in various faculties including engineering, philosophy, conservation of cultural heritage, law, economics, psychology and communication sciences. As part of OpenupEd[15] partnership, almost all courses are available as MOOCs. Courses are carried out in Italian, English and Arabic language. Students have access to digitized and indexed on-demand video lectures including links to more-in-depth study materials: books, articles, practice work, slides, bibliographical references, websites... Courses can be accessed using PCs, tablets or smart phones. Students can use a thematic forum to exchange views with their peers.

Learners who participated in MOOCs can enrol in the corresponding UNINETTUNO university course which involves a fee. This includes them in a class and gives them support of a tutor who can guide them during the course. Students' activities in MOOCs are recorded and depending on their course participation, they can take exams and receive credits valid in the ECTS.

(Lažetić P., Souto-Otero M., Shields R., 2015.)

Further information:

> http://www.uninettunouniversity.net/en/informazioni.aspx

[15] https://www.openuped.eu/

10. Other successful implementations of e-learning

10.1 Saudi e-University

Saudi e-University was established in 2011. It is government funded and approved by the Saudi Ministry of Higher Education. Transition of Saudi Arabia towards e-learning fostered creation of the Saudi e-University and establishment of a National Centre for eLearning and Distance Learning (NCeL) and e-learning Deanships in almost all universities with figure of the Dean as a leader. The National Commission for Academic Accreditation & Assessment (NCAAA) established "Quality Standards for Distance Education Courses", as a guide to guarantee the high quality of online HEIs. The Saudi Arabia transition to e-learning also involves rolling out traditional forms of distance education which have been present in number of local universities. (Al-Shahrani, Cairns, 2015.)

At the Saudi university the role of the Deanship has evolved from focusing on the technicality of e-learning to a more pedagogical-informed approach. The formation of teachers by being online learners themselves, creates a studentship experience that helps teachers be more reflective about their practices. It helps them to change their concept of teaching and tune it to e-learning.

When starting, e-University faced significant challenges, including (Al-Shahrani, Cairns, 2015):

1. Problems with internet connectivity at the beginning of the implementation, which was sorted by considering different providers
2. Slow uptake of e-learning by faculty and students at the earlier stage of e-learning implementation, which was dealt with by locally and internationally training of teachers and students and by providing extensive support from e-learning staff. E-learning staff provides help immediately, and also visits the offices when teachers need it.
3. There was resistance to adopt e-learning among some faculties. The Deanship was seen as a threat/competition.

10.2 University of Petroleum and Energy Studies in India

The University of Petroleum and Energy Studies in India made an experiment in digitizing its teaching and learning processes. In order to support e-learning, it improvised and strengthened its current IT infrastructure. It formed and trained dedicated teams to develop learning modules in house for selected seven subjects. These modules were made available to selected batches of undergraduate and post graduate students in engineering and management courses. These online modules were delivered as a supplement to face-to-face lectures held by the faculty members teaching those subjects. This experiment was run for two semesters during which continuous feedback was taken from students and teachers.

The experiment displayed that (Dwivedi, 2018):

- Student satisfaction was not significantly higher in comparison to classroom lectures.
- Student engagement was proportional to teachers' activity and presence in online course.

- Students adapted and learnt the technology faster than the faculty members.

Challenges that were faced were (Dwivedi, 2018):

- Interrupted access to broadband internet dealt by continuous follow ups to providers.
- Misunderstandings between academic and IT teams who developed online courses were handled by introducing subject coordinators.
- Lacking course content quality was handled by hiring professional instructional designers.
- Students were used to 'being taught' and weren't used to learning on their own. Teachers also accepted this. This was handled by seminars with success stories in online learning and teachers who used online learning platform well were lauded as "champions".

The experiment was considered successful and paved the way for the next phase. There were several critical success factors identified (Dwivedi, 2018):

- Buy-in of all stakeholders is required - faculty management, teachers and students
- The change has to be handeld carefully – students need to be more proactive and teachers need to create learning momentum in students.
- Academic team has to lead the design of courses and the ICT team is in the supporting role.
- Quality of the content affects student satisfaction – a most important factor for success of an online learning program.
- Teacher has many roles which requires detailed planning comparing to traditional lectures.

10.3 FUTURA project

The Universitat Oberta de Catalunya (UOC) commissioned the FUTURA (Future of University Teaching: Update and a Roadmap for Advancement) project, in collaboration with its eLearn Center, with the goal of providing a roadmap for strategic planning of the future of online and blended higher education. The project developed a five-part framework for describing next-generation pedagogy. The framework can be summarized with the acronym IDEAS: Intelligent, Distributed, Engaging, Agile and Situated. (Guàrdia, Witthaus, Padilla Rodríguez, Girona Campillo, 2015)

The project was successful because it employed innovative practices and original approaches to teaching (Guàrdia, Witthaus, Padilla Rodríguez, Girona Campillo, 2015):

- Active learning – achieved by providing students with online collaboration platform, gamification of the courses, and problem-based learning.
- Enhancement of the educational experience beyond LMS, e.g. by using remote labs.
- Collaboration between higher education institutions - sharing and joint development of resources and courses and benchmarking practices.
- Digital literacy - use of learning technologies, to improve course effectiveness and the enhance the learning experience.
- Employability and collaboration between HE institutions and employers - providing contacts with employers, internships, awarding digital badges recognized by employers, etc.
- Flexibility and personalization of learning - individual students can choose how, when and where they learn.
- Innovation as a curriculum topic - some HE institutions have innovation explicitly built into their curricula.

- Internationalization - networking between institutions in different countries, enrolment of international learners, student and staff mobility, foreign language learning, globally focused curricula, and transnational delivery of courses and degrees.
- Learning analytics – the measurement, collection, analysis and reporting of data about learners and their contexts, to understand and optimize learning.
- Non-formal and open learning - takes place in community-based settings, the workplace or through the activities of civil society organizations carried out using OERs or MOOCs.
- Recognition of prior learning - evaluation and acknowledgment of learning that occurs outside of formal credit awarding training and educational programs.
- Teaching enhancement programs - constantly keeping up to date with new technologies, trends and competences in teaching.

Framework IDEAS for next-generation pedagogy includes (Guàrdia, Witthaus, Padilla Rodríguez, Girona Campillo, 2015):

- Intelligent pedagogy - appropriate use of technology to enhance the learning experience by making educational decisions using learning analytics and teaching digital competences.
- Distributed pedagogy - making the most of strategic partnerships, offering courses openly and collaboration with other institutions and involving a wider community of interest in research and teaching activities (e.g. by projects on which students can be included).
- Engaging pedagogy – active learning (learners making some of the content, collaborating, gamification), switching the focus from content and to learning (learners focus on finding information and applying it) and offering staff teaching enhancement programs.
- Agile pedagogy - flexibility and responsiveness to learners' needs: facilitate personalization and flexibility, recognize of prior learning, widen participation and entice student mobility.
- Situated pedagogy – real-world relevance of the curriculum and the contextualization of the learning process in terms of learners' personal or professional goals.

10.4 The Open Learning Initiative: Enacting Instruction Online

The Open Learning Initiative (OLI) was created in 2002 with a grant from the William and Flora Hewlett Foundation. OLI put together a team of content experts, learning scientists, human-computer interaction experts, and software engineers to address 5 challenges Strader and Thille (2012) identified with traditional instruction:

1. Many instructors teach to a certain percentile of the class
    - In OLI courses, students move through the course at their own pace – technology provides multiple levels of instruction and pathways through the same material.
2. Students frequently do not receive immediate feedback crucial to the learning process
    - In OLI courses, students are exposed to a limited amount of content and students immediately perform activities. If a student chooses an incorrect answer, the feedback explains why the answer is incorrect.
3. The student's knowledge state is a black box to the instructor
    - OLI maintains the behind-the-scenes model of the student's knowledge state with a dashboard-style display for the instructor. Dashboard gives a high-level overview of how students are performing on learning objectives for each module in the course.
4. Degrees favor time spent in a classroom over demonstration of competency

- Students evaluate themselves against learning objectives when measuring their learning. OLIs goal is for students to work with a given concept until they achieve that learning objective and then move on.

5. There is great inefficiency in creating instruction within higher education
   - Rather than each instructor creating his own course, OLI strives to bring content experts from a wide range of colleges and universities together to create a small number of courses that will meet the needs of students.

   - In OLI, students learned a full semester's worth of material in half the time and performed as well as or better than students learning from traditional instruction over a full semester.
   - OLI project members identified several challenges (Strader, Thille, 2012):
- Online learning requires a fundamental shift for both students and instructors:
   - Students have to be more responsible for their learning for which they are not ready.
   - Instructors have to move away from the historical activity-based model.
- "Expert blind spot" problem – expertise in a subject area may make instructors blind to the learning processes and instructional needs of novice students.

10.5 Going the Distance: Outsourcing Online Learning

In 2008, University of Southern California (USC) expanded its online learning options to include a master of arts in teaching (MAT) and, most recently, master's degree programs in social work, public policy, communications, library and information science, and public health.

USC outsourced the development and delivery of fully online, Internet-delivered degrees to for-profit vendor partners. The courses contain text-based content, lecture capture, high stakes testing, professionally produced multimedia-rich learning modules that use Web 2.0 technologies, interactive case studies, graphic simulations, live web-based discussions, real-time cohort collaboration, high-profile guest lectures and group-based projects. (Metros, Getman, 2012)

USC's online master's degree programs offer students the same high standard of academic rigor on as the residential programs too. The programs are reviewed and approved by regional accreditation agencies and discipline-specific professional accreditation agencies. Online students pay the same tuition as residential students. (Metros, Getman, 2012)

To date, USC has partnered with two online privately owned integrator companies, 2tor and EmbanetCompass. They provide needs assessment, marketing strategy, student and staff recruitment, admissions and enrollment support, educational content design and conversion, technology infrastructure and delivery, hosting, assessment tools, and comprehensive training and community support services. All course content remains the intellectual property of the university, and all academic decisions remain the strict province of the university. (Metros, Getman, 2012)

One of the biggest advantages of outsourcing online learning is that the vendor partners invest a generous amount of capital funding up front, assuming the majority of financial risk. They also have the ability to retain an agile and talented workforce with expertise to support the full spectrum of their service.

USC's Rossier School of Education launched an online master of arts in teaching degree MAT@USC in June of 2009 and in two and a half years has grown from approximately 80 residential students to over 1,500 online

students. During the fieldwork phase of the online degree program, students are placed in local classrooms and record their teaching using a digital video camera. They share the recorded segments with their supervising teachers, USC faculty, guest experts, and their student peers—greatly expanding the circle and quality of feedback.

The School of Social Work is currently in collaboration with Institute for Creative Technologies (ICT) develops social worker/virtual-client simulations. Online students engage with ICT artificially intelligent interactive agents. Students can enhance their practical interviewing skills with realistic virtual-client interactions. The virtual clients can speak, express body language, show emotion, and offer immediate feedback. (Metros, Getman, 2012)

Outsourcing online learning has some challenges:

- Within faculty members there were concerns ranging from instructors being replaced by technology to traditional on-campus programs degrees losing value.
- As online programs expand, there is a need to quickly find and hire highly qualified teachers.
- Campus students should also have access to online programs, which is not aligned with traditional university policies and complicates internal tracking and reporting procedures.
- Online programs are hindered by university policies and procedures established exclusively for a time when the only delivery modality was face-to-face in the lecture hall or classroom.
- The technology is not always reliable: issues with network bandwidthcan occur, some program leaders had to reduce section size. As online programs don't need to conform to fifteen-week semesters, it requires to reprogram an institution's student information system.

Important success factors of online learning are strong executive-level support and faculty engagement and readiness. It is important that the institution partner with a company that it trusts and is comfortable working with over the many years of the contract. (Metros, Getman, 2012)

10.6 Blended Learning and New Education Logistics in Northern Sweden

Over a third of students of Umeå University (36,700 students) and Luleå University of Technology (16,000 students) do not have a main campus presence and this percentage is growing. Asynchronous web-based distance education is a viable teaching format for them but requires motivated and self-confident learners. A large number of nontraditional students do not complete courses in this format. Better results were achieved with synchronous video conferencing broadcast to community learning centers but such arrangements are not as flexible and require minimum student cohort groups in one or two places. People in sparsely populated areas have fewer learning opportunities. Many off-campus solutions have been considered lower-status and project-based. (Norberg, 2012)

Culturally, there is still need for a teacher to be in the same room with his students. ICT integration into courses seems to be changing that. Benefits are flexibility, better access to resources and improved quality and enhanced effectiveness of learning. This integrative strategy (on-campus and distance students together in a blended setting) enables universities to more fully subscribe their courses in demographic downturns.

Nontraditional students in the sparsely populated regions get a wider variety of education alternatives to choose from, even if they can't come to campus on a regular basis. In the blended format, they can experience synchronous social interaction as a part of their studies via video or desktop conferencing. The educational environment is much more interactive and engaging if students can learn together in a blended class. All other

specialized and international educational offers might be accomplished in an asynchronous format as an alternative.

If an instructor is leading a learning process with students, both in the classroom and in other locations simultaneously, teaching demands increase. When teachers and students are more accustomed to IT tools, a course becomes seamless irrespective of format. These resources enhance flexibility, options and ease of communication.

This model demonstrates how blended learning offers great potential for increasing access to education. The ultimate goal of this strategy is to dramatically increase regional accessibility and turn higher education into a ubiquitous opportunity in a region, instead of being a scarce resource in designated traditional places. (Norberg, 2012).

10.7 Kansas State University: Creating a Virtual Faculty Consortium

Creation of new degrees and certifications in traditional institutions of higher education is a slow process leading to long delays in meeting the educational needs of society. One solution is to create a virtual faculty – a faculty made of faculty members teaching in a set of academically similar institutions. A virtual faculty allows the institutions to deliver the new degree via the Internet —without taking the risks of hiring a critical mass of faculty at a single institution. (Unger, 2012)

A virtual faculty depends on Internet capability sufficient to provide courses taken at a distance and a learning management system capable of allowing faculty members to provide high-quality teaching. It also depends on faculty members willing to provide instruction in this way. Kansas State University and the University of Nebraska, Lincoln, were successfully delivering degrees over the Internet in the late 1990s.

Great Plains IDEA is a virtual faculty that provides degrees and certificates in agriculture (http://www.agidea.org), and the university participates in a third virtual faculty providing nuclear engineering education (http://www.big12engg.org).

The primary goal of this effort was to be more responsive to current educational needs while providing a flexible environment in which new degrees can be offered and old degrees dropped when no longer needed.

Two major challenges were identifed in Great Plains IDEA implementation:

- which institution would count the student in its head count - in traditional campus setting this was a question of student residency and tuition.
    - The concept of residency for graduate work was removed completely.
    - A process was setup to determine annually a common tuition for all institutions.
- which institution would grant the degree (it was never a consideration that Great Plains IDEA would offer the degree or certification).

Great Plains IDEA provides the offering of thirteen degrees and certifications in human sciences (established in 1999), with eleven institutions participating. AG*IDEA (established in 2007, http://www.agidea.org) offers ten degrees and certifications. Great Plains IDEA currently encompasses institutions in seventeen states, from Texas to North Dakota and from California to Florida. (Unger, 2012)

The concept of a virtual faculty is a way universities can respond to their increasing responsibility to meet the fast changing educational requirements. Collaboration with industry members may arise, providing additional members for a collaborative teaching from qualified professionals in the specific industry. Institutional change must at least maintain the quality education traditional universities provide. (Unger, 2012)

10.8 The Indiana University eTexts Initiative

Rising cost of college textbooks was a big burden for students, often motivating them to find creative ways of mitigating this expense. As part of its second Information Technology Strategic Plan, in 2009 Indiana University initiated eText a two-year pilot program.

The project was guided by several objectives (Wheeler, Osborne, 2012):

- To reduce the costs of course-related materials for students,
- To provide faculty with the high-quality materials,
- To gain and new tools for teaching and learning - for instance, allowing annotations in an e-text that can be shared with other users,
- To develop a sustainable model acceptable to all stakeholders: faculty, students, authors, and publishers.

In discussions with publishers, it became clear that content creators are ready to lower their prices considerably if they would get paid for each use of their content (and avoid illegal digital copies).

This required moving from a sales model where some percentage of students buy the content (textbooks), to a model where each student in a course section pays for it. In the fall of 2011 IU entered into agreement with Courseload (an e-reader software company) and five leading academic publishers to provide e-texts for the university. The official rollout of the program began in the spring 2012 semester. (Wheeler, Osborne, 2012)

IU's arrangement allows them to assess the price of an IU eText (to determine whether it is acceptable to students) before choosing to opt in. A common platform for eTexts utilized a single sign-on and was integrated with Oncourse (IU's LMS), which allowed students to share highlights and annotations among their peers in class.

Benefits of eText pilot project are (Wheeler, Osborne, 2012):

- Cost savings for students.
- Development of software that improved content delivery (Courseload e-reader can access eTexts, both online and offline, from all publishers) and enhanced learning.
- The software enables teachers to create their own digital course-packs by uploading self-produced content, open educational resources, or content from other various sources.
- The software gives students and teachers options to search, annotate, highlight, and share an eText - which makes learning with eText a more interactive, collaborative experience.

eTexts are available to students few weeks before classes start. Students can access their eTexts as long as they are enrolled at Indiana University.

10.9 The Changing Pedagogical Landscape

The first Changing Pedagogical Landscape study (2015) study stated that “although innovation is taking place very widely across Europe, it still forms a very small fraction of total higher education provision.” (Henderikx, Jansen, 2018). This study has shown that many examples are emerging that can potentially have an impact at a system level. Based on cases and interviews in this study, some overall trends towards change are identified. New modes of teaching and learning based on ICT can solve some problems that higher education is facing today and can offer new opportunities for teaching and learning. They will transform higher education provisions in following years.

The study helped identify key recommendations on new modes of teaching and learning (Henderikx, Jansen, 2018):

- University strategies for digital education:
    - Develop leadership, institutional vision and strategy for blended learning and teaching for on campus degree education.
    - Assure that leadership of innovation is shared at all levels: the board, the faculties, deans and program directors and teaching staff.
    - Define institutional goals and innovation plans for new technologies with impact on the course and curriculum level.
    - Develop strategies for continuous innovation in the institution, involving digital education in the core educational areas
    - Design and adopt a joint educational and innovation strategy, where every teacher can develop enriched learning activities for the students.
    - Translate institutional visions and strategies at the curriculum level, looking for a balance between Student numbers/access, quality and cost-effectiveness.
    - Faculty strategy should include mainstream degree education, short degrees, continuous education, and open education
- Implementation of new modes of teaching
    - Promote institutional concept on learning and teaching around a central principle, e.g., “active learning”, “guided independent learning” or “open-space learning”.
    - Find the right balance between face-to-face and online education.
    - Stimulate a culture of change and a mindset to support the institutional strategy by:
        - enticing a bottom-up approach from teachers embedded in strategy plan
        - experiment with blended and online learning and teaching
        - integrating digital education in the quality assurance system of the university
        - rewarding good practices in education with regard to career development
        - activating innovation frameworks project funding in context of strategy
        - creating business models for continuous and open education
        - using multi-annual operational plans including desing of new curricula modes
    - Create enablers that facilitate innovation processes as:
        - show and share leadership with all decision levels of the university.
        - organizing continuous professional development of staff (in curriculum design and digital competences)
        - creating awareness about the gap between current practice and advanced course design/maturity in blended learning,
- Recommendations for teaching staff:
    - Find out needs of target groups in subject area and redesign curricula accordingly.
    - Bring in your experience and expertise in the wider context of the curriculum
    - Create networks with peers and collaborate at the subject level.
        - Share practices on curriculum design and sharing patterns of good practices in blended and online education
        - organize educational and technological support services to staff and students
        - creating course teams for blended and online learning on various subjects

        - organize institutional evaluation to assess if the objectives are achieved and measure the impact of innovation and new pedagogical models,
    - Organize institutional evaluations and research on the design, implementation and effects of blended teaching and learning
    - Collaborate in networks to build synergies of content and pedagogies and exchange staff and students accordingly.
    - educational resources (e.g., course material, multimedia products, assignments) in your subject area broader.
    - Increase your research output related to educational innovation.
    - Consider each course as a unique teaching project, requiring specific approaches.
    - Apply for additional funding for course development / innovative projects.
    - Participate in international expert groups and in research and innovation
    - Increase research output related to course development / innovative projects.
    - Stay up to date with developments in blended and online learning and teaching.
- Recommendations for governmental policies:
    - Take the development of these areas of provisions into account when creating policies and strategies, valorizing and maximizing innovation in all areas.
    - Organize a strategic working group including universities, students, social partners and experts to assess the state of affairs, current needs and opportunities.
    - Support platforms for online courses and curricula, online short degrees, OERS and MOOCs. Organize access to them to learners and labor market.
    - Define funds for students on an equal basis enticing innovation and lifelong learning.
    - Entice innovation and change, encourage and accelerate innovation, e.g. by funding schemes and career development incentives.
    - Stimulate or organize continuous professional development of teachers and encourage institutional leadership for continuous innovation.
    - Adapt quality assurance and accreditation systems to the specifics of digital learning, stimulating innovation in education by the increased use of technology.
    - Motivate institutional evaluation and research of new modes of teaching.

Challenges for implementation of new modes of teaching are following (Henderikx, Jansen, 2018):

- Institutional policies on online / blended education
    - The existence of an institutional strategy or policy for online and blended education.
- Innovative climate – workload
    - Teaching tasks shift in their nature and distribution, not necessarily increase the total workload. Work must be restructured at the individual and at organisational level.
- Digital and media competence
    - Specific pedagogical and didactical skills are needed in online or blended education. The lack of teacher training often limits the capacity of innovation.
- Quality of online provision
    - Quality assurance of university education should be able to accommodate any form of educational offering within a generic framework. The E-xcellence program provides an open licensed quality assurance framework and manual for blended and online education.
- Teaching versus research careers
    - Currently, teachers careers are strongly linked to research which is a barrier for implementation of innovative teaching. To alleviate this, in Aalto University (Finland), all teaching staff has to demonstrate regularly evidence on teaching skills, which is valued in external audit reviews. University of Graz (KFU) (Austria) offers a prize for projects in the field of new media (“E-Learning Champion”). The prize winner and his work are given as an example of best practice. In addition, the Austrian government provides a federal prize for excellence in teaching - the “Ars Docendi“ prize.
- Legal issues and personal rights

    - Online education introduces questions of legal issues and personal rights of teachers and students: course material copyrights, who can publish recordings of lectures, the publication of documents, personal rights to refuse to appear on recording or streaming facilities, data protection, etc. Staff needs to be trained on copyright law.
- Funding issues
    - Low levels of funding in many countries are a barrier for educational innovation. E.g. in the higher education law in Austria, a unit for funding is a standard student, excluding part-time students (who need flexible learning solutions). The Finnish Ministry of Education and Culture supports innovative teaching and international education through project funding, but universities get cuts in the basic funding for higher education. In many countries (like Finland), performance-based funding is used. Aalto University gives strategic funding for innovation to improve learning achievements.
- Questions of costs versus scalability
    - The development cost of online education is higher compared to traditional education but the delivery cost of an online course is lower. Because of the lower cost of an online course per student, the course will be more scalable.

10.10 Implementing a university e-learning strategy: levers for change within academic schools

Sharpe, Benfield and Francis (2006) describe the implementation of an e-learning strategy at Oxford Brookes University (UK) in terms of the levers used to promote effective uptake and ensure sustainable embedding of the strategy.

Their aim was to develop an implementation plan that would increase the uptake of e-learning at the institution and develop effective and sustainable e-learning courses. Within some members of this university an increasing proportion of students are now participating in blended learning.

The implementation plan was based on existing recommendations for the adoption of learning technology. They identified specific successful activities. Sharpe, Benfield and Francis (2006) concluded that success of these activities was likely due to following levers: contextualization (flexibility in practices allowed schools to contextualise their plans for change), community (teaching fellows came together in action sets, circulating news and information, building and preserving new knowledge) and teachers' beliefs (communities challenged their beliefs about e-learning), rather than the activities themselves.

Sharpe, Benfield and Francis (2006) found that asking schools to write their own strategies was helpful because emphasis at the school level fitted what was needed within their institutional context and promoted discussion and debate that influenced individual teachers' beliefs.

School-level strategies got buy-in from stakeholders. Learning technologists went from being influential individuals to developing as a community of brokers. Engaging course developers in targeted staff development benefited implementation and evaluation.

School-based developments continue to be lead and driven by innovators, but they don't solely rely on them for implementation. The courses will be sustainable in the long term because they are supported by school deans, schools' local strategies for e-learning and learning technologists and developers.

11. References

Ashford-Rowe, K. H. & Howarth, D. J. (2011). Changing the game: *The Smarthinking experience*. Griffith University. Retrieved from http://bit.ly/27ig0zX

Bates, S., Hardy, J., Kay, A., Galloway, R., McQueen, H., & Kirsop, P. (2012). Student-Generated Content for Learning (SGC4L): Enhancing Engagement, Feedback and Performance. JISC. The University of Edinburgh. Retrieved from http://jiscdesignstudio.pbworks.com/w/file/fetch/61561968/ SGC4L-final-evaluation-report.pdf

Bawden, D. (2008). Origins and Concepts of Digital Literacy. In C. Lankshear & M. Knobel (Eds.), Digital Literacies: Concepts, Policies and Practices (New Literacies and Digital Epistemologies) (pp. 17-32). New York: Peter Lang Publishing Inc.

Center for Research on Learning and Teaching (CRLT). (2016). Active Learning. University of Michigan. Retrieved from http://www.crlt.umich.edu/tstrategies/tsal

Dahlstrom, E. & Brooks, C. D. (2014). ECAR Study of Faculty and Information Technology. Research report. Louisville, CO: ECAR. Retrieved from http://net.educause.edu/ir/library/pdf/ers1407/ers1407. pdf

European Commission. (2015). ECTS Users' Guide 2015. Luxembourg: Publications Office of the European Union. Retrieved from http://ec.europa.eu/education/library/publications/2015/ects- users-guide_en.pdf

European Commission/ EACEA/ Eurydice (2015). The European Higher Education Area in 2015: Bologna Process Implementation Report. Luxembourg: Publications Office of the European Union. Retrieved from http://www.ehea.info/Uploads/SubmitedFiles/5_2015/132824.pdf

European Commission, Joint Research Centre (2016). Digital Competence Framework for Citizens. Retrieved from https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

European Union (2002-2016). Europass. Retrieved from https://europass.cedefop.europa.eu/en/ resources/digital-competences

Foster, E. (2015). What have we learnt from implementing Learning Analytics at NTU? Retrieved from https://analytics.jiscinvolve.org/wp/files/2015/07/jisc-la-network-ed-foster-ntu.pdf

Gamrat, C., Zimmerman, H. T., Dudek, J., & Peck, K. (2014). Personalized workplace learning: An exploratory study on digital badging within a teacher professional development program. British Journal of Educational Technology, 45(6), 1136–1148. Retrieved from http://onlinelibrary.wiley.com/ doi/10.1111/bjet.12200/epdf

Grann, J. (2015). LAK15 Case Study 3: Flexpath: Building Competency-based, Direct Assessment Offerings. Learning Analytics Review, Paper LAK15-3. Retrieved from http://www.laceproject.eu/ learning-analyticsreview/building-competency-based-offerings/

Hermans, H., Janssen, J., Vogten, H., & Koper, R. (2015). Flexible Provisioning Adult Learners. Journal of Universal Computer Science, 21(2), 206-222.

High Level Group on the Modernisation of Higher Education. (2013). Report to the European Commission on Improving the quality of teaching and learning in Europe's higher education institutions. Luxembourg: Publications Office of the European Union. Retrieved from http://ec.europa.eu/education/library/reports/modernisation_en.pdf

High Level Group on the Modernisation of Higher Education. (2014). Report to the European Commission on New modes of learning and teaching in higher education. Luxembourg: Publications Office of the European Union. Retrieved from http://ec.europa.eu/education/library/reports/ modernisation-universities_en.pdf

Inamorato dos Santos, A., Punie Y., Castaño Muñoz J. (2016). Opening up Education - A Support Framework for Higher Education Institutions, European Commission, Joint Research Centre (2016), Retrieved from http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101436/jrc101436.pdf

Iosup, A. & Epema, D. (2013). An Experience Report on Using Gamification in Technical Higher Education. Retrieved from http://www.ds.ewi.tudelft.nl/~iosup/gamification-higher- education14sigcse_sub.pdf

Jisc. (2014). Developing digital literacies. Retrieved from http://www.jisc.ac.uk/guides/developing- digital-literacies

Jisc. (2016b). Gamifying the process. Retrieved from http://www.jiscdigitalmedia.ac.uk/infokit/ games/gamifying-the-process

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). NMC Horizon Report: 2015 Higher Education Edition. Austin, Texas: The New Media Consortium.

King, G. & Sen, M. (2013). The troubled future of colleges and universities. PS: Political Science and Politics, 46(1), 81-113. Retrieved from https://gking.harvard.edu/files/gking/files/troubledfuture.pdf

Koller, D. (2015). Daphne Koller: Announcing the first MBA on Coursera from the University of Illinois. [Blog]. Retrieved from https://blog.coursera.org/post/118152158892/daphne-koller- announcing-the-first-mba-on

Lažetić P., Souto-Otero M., Shields R. (2015.). OpenCases: A Catalogue of Mini Cases on Open Education in Europe, European Commission, Joint Research Centre (2015), Retrieved from http://publications.jrc.ec.europa.eu/repository/bitstream/JRC96524/jrc96524.pdf

Mapstone, S., Buitendijk, S., & Wiberg, E. (2014). Online learning at research-intensive universities. League of European Research Universities (LERU). Advice Paper.

Mejías Borrero, A. & Andújar Márquez, J. M. (2012). A Pilot Study of the Effectiveness of Augmented Reality to Enhance the Use of Remote Labs in Electrical Engineering Education. Journal of Science Education and Technology, 21(5), 540-557. Retrieved from: http://link.springer.com/article/10.1007%2Fs10956-011-9345-9

Merriman, J., Coppeto, T., Santanach, F., Shaw, C. and Aracil, X. (2016). Next Generation Learning Architecture. Barcelona: Universitat Oberta de Catalunya. Retrieved from http://openaccess.uoc.edu/webapps/o2/bitstream/10609/47481/6/Next_Generation_Learning_Architecture.pdf

OECD, (2001) Education at a Glance. Retrieved from: http://www.oecd.org/edu/skills-beyond-school/educationataglance2001-home.htm

Pérez-Mateo, M., Maina, M.F., Guitert, M. & Romero, M. (2011). Learner Generated Content: Quality Criteria in online Collaborative Learning, in EURODL Special Issue: Creativity and Open Educational Resources (OER), 20 December 2011. Retrieved from http://www.eurodl.org/index.php?p=special&sp=articles&inum=2&article=459

Sharples, M., Adams, A., Ferguson, R., Gaved, M., McAndrew, P., Rienties, B., Weller, M., & Whitelock, D. (2014). Innovating Pedagogy 2014: Open University Innovation Report 3. Milton Keynes, UK: The Open University.

Siemens, G. (2010). About: 1st International Conference on Learning Analytics and Knowledge. Retrieved from https://tekri.athabascau.ca/analytics/

Spencer, B. (n.d.). Defining prior learning assessment and recognition. Athabasca University. Retrieved from http://priorlearning.athabascau.ca/what-is-plar.php.

Stone, C., Hewitt, C., & Morelli, E. (2013). Enhancing Academic Achievement in Online Open Education. THETA: The Higher Education Technology Agenda. Retrieved from http://eprints.utas.edu.au/16366/1/THETA_2013_Stone.pdf

UK Centre for Materials Education, Higher Education Academy. (n.d.) Active Learning. https://www.heacademy.ac.uk/sites/default/files/active-learning.pdf

Al-Shahrani K., Cairns L., (2015.), *Managing the change during E-learning integration in higher education: A case study from Saudi Arabia*, Routledge

Dwivedi A., (2018.), *Digitizing Academic Delivery in Higher Education*, 5th International Symposium on Emerging Trends and Technologies in Libraries and Information Services, IEEE

Guàrdia L., Witthaus G., Padilla Rodríguez P., Girona Campillo C., (2015.), *Next Generation Pedagogy: IDEAS for Online and Blended Higher Education*, Universitat Oberta de Catalunya

Strader R., Thille C., (2012.), *The Open Learning Initiative: Enacting Instruction Online*, In Oblinger D. G., (2012.), Game changers: Education and Information Technologies, Educause

Metros S. E., Getman J. F., (2012.), *Going the Distance: Outsourcing Online Learning*, In Oblinger D. G., (2012.), Game changers: Education and Information Technologies, Educause

Norberg A., (2012.), *Blended Learning and New Education Logistics in Northern Sweden*, In Oblinger D. G., (2012.), Game changers: Education and Information Technologies, Educause

Unger A., (2012.), *Kansas State University: Creating a Virtual Faculty Consortium*, In Oblinger D. G., (2012.), Game changers: Education and Information Technologies, Educause

Wheeler B., Osborne N., (2012.), *Shaping the Path to Digital: The Indiana University eTexts Initiative*, In Oblinger D. G., (2012.), Game changers: Education and Information Technologies, Educause

Henderikx P., Jansen D., (2018), *The Changing Pedagogical Landscape: In search of patterns in policies and practices of new modes of teaching and learning*, European Association of Distance Teaching Universities (EADTU)

Sharpe R., Benfield G., Francis R., (2006), *Implementing a university e-learning strategy: levers for change within academic schools*, ALT-J, Research in Learning Technology Vol. 14, No. 2, June 2006, pp. 135–151