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# Educating for a digital future

## – Walking three roads simultaneously: one analog and two digital

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**ABSTRACT:** In this paper we introduce the *digitization challenge* for higher education. Furthermore, three parallel ‘roads’ are proposed to consider in designing higher education content to address the *digitization challenge*. Program designers and educators will benefit by giving consideration to: (1) *non-digital teaching activities that promote digital literacy*, (2) *digital opportunities to enhance traditional classroom practices*, and (3) *digitizing the university, referring to the opportunity to move higher education into a fully digital means of distribution (MOOCs)*. The paper provides examples of each road ahead.

### 1 INTRODUCTION

Since a few years back there has been a vocal debate on the digitization of higher education. Most often, this debate has focused on the positive opportunities associated with digital massive online courses (MOOCs). However, objections have been raised, arguing that the disruptive potential of digitization has been overstated and is the result of tendentious research [1, 2]. Nevertheless, it is clear that traditional content industries like magazine publishing [3], publishing houses [4], libraries [5] and the music industry [6] has been subject to strong pressures to reconfigure business models based on traditional means of distribution to digital means of distribution. Even though the verdict seems to stand clear that digitization of higher education will take longer time than suggested by some proponents [7], it is equally clear that long-term planning of higher education needs to consider the opportunities of digitization [8].

Broadly speaking, the digitization pressure stems mainly from the ‘opportunity space’ following in the wake of Moore’s Law [9]. In short, the continued lower cost of computing power brings with it opportunities of progressively cost efficient delivery of services compared to traditional means of distribution.

In the context of higher education, this pressure manifests itself in numerous ways. Prospective students form their digital expectations as learners in the pre-university school system and as consumers of digital services for social interaction and entertainment. The use of digital devices and education software is since years back a reality in the pre-university school system and the established use of services like Facebook, YouTube and Instagram among teenagers should come as no surprise to any reader of this text. After university, and regardless of profession, work-life is increasingly dependent on digital services and infrastructures for storage, retrieval and editing of work material.

In their role as potential employers of graduate students, firms, corporations and public agencies could benefit from actively tailoring higher education programs to their specific needs. For example, MOOC platform providers could match thought-leadership in any subject area with a multitude of students geographically distant from each other. Potentially, a parallel higher education system could slowly arise that relies more heavily on digital elements in its program delivery. An example of this is the Minerva Schools (<https://www.minerva.kgi.edu>) that is built on a blended model of distribution at a significantly lower price than a traditional campus undergraduate program (annual tuition fee stands at \$10,000 in October 2015). In the following section, we will refer to the student’s *digital* expectations, the future *digital* work-life, the employers interest in customizing higher education for their potential recruits by means of *digital* MOOC platform providers and the potential rise of the *digital* parallel university system as the *digitization challenge*.

### 2 DIGITAL MISCONCEPTIONS, AND SIGNALS THEREOF

For informed designers of higher education (designers should be interpreted broadly and as a scalable concept, meaning that a designer could potentially be an individual instructor, programme director or

faculty/university programme management), the *digitization challenge* should come as no surprise. However, in our experience, reality is more varied than that. There are still examples of *rejection* of the digitization challenge, often based on the assumption that traditional campus courses clearly outperforms online alternatives. This might be true considering that research still is ambiguous in terms of the effectiveness of campus versus online education [10]. However, the important strategic question is not to narrowly focus on the effectiveness of online delivery, but also include cost into the analysis. Even if the argument of the inferior quality of the online alternative holds true, the cost of delivery will be lower compared to the cost of running the campus course, given the potential of economies of scale and lower marginal cost for each repetition of the course. Consequently, the drop in cost may outweigh the drop in quality, potentially giving rise to a cost benefit ratio clearly favoring online delivery.

In our experience, it is uncommon to encounter the full rejection stance. By far it is more common to encounter *misconceptions* about the ability to deal with the digitization challenge. Below we have listed beliefs that could signal digital ignorance. It should be noted that an individual item might be a false positive of digital ignorance. However, if several of these misconceptions are present it could be a sign of true digital ignorance.

#### *Beliefs of digital preparedness*

- Fully equipped computer halls secure students from the digitization challenge.
- Overhead projector with plug and play facilities for faculty and guests to connect their equipment is an example of addressing the digitization challenge.
- Hosting your own IT operations shows aptness in dealing with the digitization challenge.
- Embedded hi-quality produced student 'success stories' on the university/faculty/department homepage displays readiness to deal with the digitization challenge.
- Continuously in-house developed intranet for internal communication displays ability to stay ahead of the game in terms of the digitization challenge.
- Faculty is on average well-prepared for the digitization challenge.
- Blogging faculty is a good example of how to deal with the digitization challenge.

Instead, we suggest that designers of higher education focus their quality assurance efforts on three venues or roads ahead to address the digitization challenge. The first road – the analog road – aims to develop quality assurance systems and activities that acknowledge traditional non-digital activities that promote digital skills. The second road – the digitally overlaid classroom – seeks to harness students' continuous connection to the Internet to add value to learners in classrooms as well as outside the classroom. The third road – the MOOC road – suggest that designers of higher education should actively promote efforts to reach out by means of digital distribution. Each of these roads will be extended upon in the next section.

### **3 EXAMPLES OF EACH ROAD AHEAD**

#### **3.1 The 'analog' road**

The rationale for including the analog road bore out of the authors' frustration with external visitors and auditors equating digital-centric education with the prevalence of computers and software-based higher education management systems supporting the students. We believe it is important to offer traditional teaching that supports the digital professional literacy. This could potentially include content that covers technological change, innovation, digitization and history of technology. From a problem-solving point of view, it could also include design courses that specifically target wicked problems [11] in the context of designing and specifying interactive systems or developing business models based on the dynamics and logics of the digital economy. Both authors of this paper run courses covering these topics.

#### **3.2 The road of the digitally overlaid classroom**

Probably the most common instance of the digitally equipped classroom is the classroom with a computer connected to a projector. Much can be achieved with this setup, for example use of YouTube-clips and facilitating remote guest lectures in the classroom.

However, a strong enhancement potential lies in leveraging the increased use of smartphones among students. We have successfully integrated the Flipboard.com app into our classes that allows course instructors to post news items relating to the course content off-lecture time to a common repository, where subscribing students receive push-notifications about new postings. This facilitates connection between specific worldly events with the theoretical concepts and models covered in the course. It also functions as a soft reminder that the course is running and that the instructors are contributing beyond office hours to the course, as well as beyond completion of the course.

Clickers is an established proprietary audience response technology that allows instructors to pose questions, enable voting and displaying the result from the voting procedure. Mentimeter.com is another digital service enabling audience voting by means of smartphones. This could be used both live in classes as well as off-lecture time to push polls to students.

In short, the potential of the digital overlaid classroom mainly lies in harnessing students' use of smartphones. And in particular, push notifications act as a 'nudging' reminder in the form of a posted article or a poll to be answered outside classroom-time to fuel classroom discussions or just to create a sense of community and remote presence of the course.

### 3.3 The fully digital road

The fully digital road is one that fully embraces digital means of distribution. In this section we will consider technology platforms that provide an integrated digitally environment to support the delivery of higher education to a set of (qualified) learners, typically in the form of video lectures, assessment support and discussion forums. MOOC platforms by definition target massive amounts of learners in an open fashion, but MOOC technology platforms could potentially also be used for a *closed* set of qualified learners. This might obviously impede the true sense of open and massive. No matter how these platforms are used, we believe this is of minor importance for the purpose of this paper, since the MOOC platform provides an integrated platform that enables *full digital delivery* beyond the physical classroom.

We do believe that experimentation along this parallel road will be necessary. Even if it initially would mean instructors only experimenting with recording shorter video-versions of lectures, this would symbolize an important step forward towards utilizing MOOC platforms as means of fully digital distribution. The reward of effective use of MOOC platforms could potentially increase the productivity of the instructor to focus attention to more value-adding activities like improving lecture content, curating course material or freeing time for research activities. This should internally be acknowledged as a signal of addressing the digitization challenge.

## 4 CONCLUSIONS AND RECOMMENDATIONS

Given the introduced *digitization challenge*, designers of higher education programs will need to equip students for a digital workplace that is already reality. We are proposing three parallel tracks to consider in high-level design of higher education programs. Program designers and educators will benefit by giving consideration to: (1) *non-digital teaching activities that promotes digital literacy*, (2) *digital opportunities to enhance traditional classroom practices*, and (3) *digitizing the university, referring to the opportunity to move higher education into a fully digital means of distribution (MOOCs platform)*.

Designers of higher education programs that mainly focus on the importance of MOOCs, typically express awareness of higher education digitization, but with a narrow focus and lack of broader sophistication as regards to the development tracks mentioned above.

The digital strategic challenge for any higher education program is not to eliminate any of the proposed tracks, but rather to consider these three roads *actively, continuously and simultaneously*. Digital ignorance in the short term will lead to *digitization blindness* rather than beneficial digitization of higher education, that in tandem amplifies and enhances the traditional teaching activities with running teaching activities partially and fully on MOOC platforms.

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