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# (Digitally) transforming education in a large university

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***Abstract***

*The world is changing faster than ever and so is the context of higher education. Students need to develop an agile mindset and corresponding generic skills for the flexible workplace that awaits them and the many societal challenges they face. Pedagogical and technological change can no longer be postponed by higher education institutes. However, this (digital) transformation is not an easy task.*

*This paper elaborates on the process of digital and educational transformation at KU Leuven (Belgium), one of Europe's oldest and largest research-based universities, from a meta-perspective. Through several examples, challenges and opportunities to trigger a shift in workforce, technology and culture are explained. The applied network-based model of educational development, pedagogical action research project methodology and informal initiatives definitely play a crucial role.*

***Keywords:*** *Digital transformation; higher education; management; pedagogical action research; cultural change.*

## 1. Introduction

The world is changing faster than ever and so is the context of higher education. Students of today are not the same as students of yesterday or tomorrow, having different life, study and career aspirations (Barhate, Dirani, 2022). At the same time, when manoeuvring through this ever evolving society and work field, our 'Generation Z' students are expected to demonstrate a fair amount of flexibility, with an attitude and generic skills set to match (Williams et al., 2023). This was exaggerated and accelerated by the COVID-19 pandemic. Universities aim to equip their students for this agile mindset with competences needed for a lifetime career in this volatile, uncertain, complex, and ambiguous (VUCA) world, rather than traditional content. They feel the urge for a learning evolution and "the development of updated and agile curricula in […] higher education" as stated by the World Economic Forum (2016) and become VUCA Universities as described by Korsakova (2020): validated, unique, complementary, attractive. For this, a significant educational reform is necessary, which is underpinned by several authors (e.g. Draskovicet al., 2020; Pup & Filep, 2021; Jackson & Konczos Szombathelyi, 2022). However, this seems to be a very challenging ambition that occupies higher education institutions worldwide. Moreover, where the rapid change in educational technology offers tremendous opportunities to address the changing needs of students, it also adds a complex digital component to educational transformation.

Change management and finding ways to consolidate results remain the most important challenges in this process. Brooks and McCormack (2020) indeed state that full (digital) transformation towards sustainable future-proof higher education requires shifts at different levels: cultural change, workforce change and technology change.

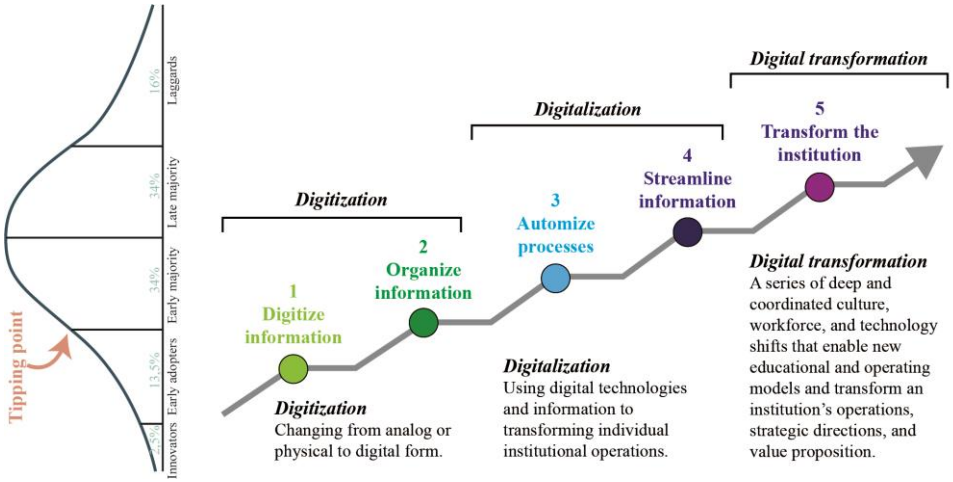


*Figure 1. Digital transformation in higher education related to Roger's diffusion of innovation. Sources: Brooks & McCormack (2020), Rogers (2003).*

Figure 1 shows how this transformation is related to Roger's diffusion of innovation (Rogers, 2003), evolving from a small group of innovators towards involving a majority of stakeholders. This paper elaborates on the process of digital and educational transformation at KU Leuven (Belgium), one of Europe's oldest and largest research-based universities, from a meta-perspective.

## 2. Methodology

### *2.1. Workforce change: network-based model of educational development and innovation*

Peeters (2022) describes the dynamic model of discipline-specific educational development at KU Leuven to implement centrally set policy priorities regarding educational innovation, hereby ensuring alignment with bottom-up initiatives and translation to facultary contexts. In this model, educational developers and an increasing number of educational technologists at different levels are closely interrelated and all play an important role: at the faculty, group (cluster of faculties) and university-wide (Figure 2). Peeters (2022) focuses on several group-wide collaborative projects within the Group of Science, Engineering and Technology (SET Group) on topics such as multicampus education, virtual mobility, MOOCs for Credit, learning analytics, teaching assistant training and collaborative learning spaces. Additionally, the launch of a SET Advisory Board Educational Innovation is mentioned as a way to allow dialogue between vicedeans, other staff and students, increasing information exchange on initiatives at different levels. In this context also communities of practice originate as typical bottom-up approaches that are known to have a powerful effect on learning and teaching in universities (Wenger-Traynor & Wenger-Traynor, 2015).


*Figure 2. KU Leuven Learning Lab as a university-wide networking structure, involving educational developers and technologists at different levels. The yellow dots represent project managers at the intermediate Group level, other dots are staff members at the facultary and university level. The blue circle represents the Group of Science, Engineering and Technology, in which LESEC operates as an additional network. Source:Peeters (2022).*

The Leuven Engineering and Science Education Centre (LESEC), a research centre grouping disciplinary teaching staff and educational developers in STEAM (Science, Technology, Engineering, Architecture and Mathematics) with a focus on educational research and practice, and KU Leuven Learning Lab (KULLL), a university-wide networking structure, play a crucial rol herein.

### *2.2. Technology change: project-based approach including pedagogical action research*

KU Leuven generally uses a project-based approach to allow defining clear goals that translate the university's vision on 'Going Digital' into concrete output, leading to implementation and consolidation of results. Particular attention is given to the development of transversal axes across study programmes related to expected (lifelong learning) competences and international developments. All projects are intertwined with digital transformation and many aim for a full implementation of technology. Principles of pedagogical action research are applied in order to address real issues, modify practice as well as contribute to theoretical knowledge. Hereby the cycle of observe - plan - act - reflect is followed (Norton, 2009). Projects typically start small-scale, while tracking down and involving the innovators. By making benefits visible through small-scale pilot studies the group of early adopters is then expanded. Innovators may apply regularly for internal funding to start such pilots, selection is done by a commission that links ideas to university wide strategic aims. Consequently, the most successful projects in terms of positive evaluation by involved students and teaching staff upscale towards being suitable for larger groups of stakeholders, thus creating an early majority past the tipping point described by Rogers (2003) (Figure 1). Principles of Sociocracy 3.0 (S3) are applied, which is an open source framework of patterns and practices to collaborate more effectively in multidisciplinary non-hierarchically structured teams (Priest & Bockelbrinck, 2017).

### *2.3. Cultural change: informal initiatives*

Additionally to the more formal projects, several informal initiatives trigger cultural change from the inside. For instance, members of the research centre LESEC have organized meet-up events called 'When ideas…' since 2021 on topics such as learning analytics, learning spaces, effectiveness in education, digital transformation, lifelong learning and flexible curricula, assessment … Interested colleagues join these informal sessions to reflect and discuss out-of-the-box, leaving comfort zones and sharing passion. Think-Pair-Share is used as a cooperative discussion strategy, starting from a concrete question, as it is shown to be effective to stimulate critical thinking and promote group participation (e.g. Deore & Arora, 2022). In some cases a 'When ideas' session leads to the reactivation of former projects, concrete actions or publications in the LESEC news letter, hereby reaching more stakeholders. Innovation and change is thus triggered bottom-up.

## 3. Results and discussion

Initiatives and projects within the networking structure of educational innovation at KU Leuven have shown to be effective in certain ways to facilitate aspects of (digital) transformation. Especially workforce change and technology change are triggered, for instance by breaking through hierarchical structures, involving different roles collaboratively, hiring educational technologists, implementing blended learning including adaptive learning paths, applying learning analytics … However, challenges become more visible in this process and are mainly related to resistance to cultural change, expressed by resistance at all levels to adapt traditional teaching and learning methods and organization. In other words, resistance to cultural change acts as a catalyst of resistance to workforce and technology change as well.

Based on some concrete exemplary cases and experiences this paper discusses both successes and pitfalls related to the used methodologies.

### *3.1. Example: network-based LESEC team 'Education Z'*

LESEC organizes its research, development and innovation in several themes based on the expertise, experience and interest of members. For each theme a team of LESEC members is formed, whereby one member performs the role of coordinator and several subthemes are defined in co-creation. The theme 'Education Z' focuses on creating learning experiences for generation Z students that encourage them to become 'global citizens' with the necessary knowledge, skills and motivation to thrive in their future career path and beyond. Global competencies, active learning, collaborative learning spaces, online learning and assessment, teams across borders and gerenation Z are current subthemes. In about four meetings a year the team discusses insights from different perspectives about the ideal learning environments, learning formats and assessment. This initiates more formal cooperation and actions e.g. by setting up a master's thesis or other project together, or by organizing quantitative and qualitative data collection as a team.

This example shows that a network-based approach such as LESEC truly triggers exchange and cooperation across boundaries. The fact that stakeholders with different backgrounds and functions, but with common interests, are brought together induces initiatives that would otherwise not originate or would be much smaller scale and less interdisciplinary. However, the meso- and meta-level perspective also complicates certain processes. For instance, the idea arose to start-up a co-creation project with students but it seemed unfeasible to do this as a mutual initiative. Instead, several small-scale projects will run within different sub-themes and Education Z will bring results together.

### *3.2. Example: towards implementing learning analytics with a collaborative project*

One of the group-wide educational innovation projects of the SET Group concerns using generated data by online learning material for increasing the efficiency and effectiveness of learning (Tubbax & Peeters, 2023). In close collaboration with different stakeholders at all levels of university, data are collected, analyzed and interpreted in order to give motivational and action-oriented feedback to didactic teams. It soon became clear that the process of making learning analytics scalable and sustainable is closely related to the digital transformation of education at KU Leuven. The simultaneous migration towards a new Learning Management System (LMS) made this symbiosis even more visible. However, it seems very hard to convince a larger group than the innovators of the advantages of learning analytics.

This example shows that a technology shift towards implementing learning analytics is challenging but feasible, as long as all relevant stakeholders are involved. This is possible within the framework of a project. However, expanding the group of actual users to an early majority requires a slow and gentle process of repeated PDCA-cycles and action research techniques. The tipping point in Figure 1 between early adopters and early majority, or 'chasm' as already described by Moore (1991), definitely is the biggest challenge. Generating sufficient 'proof' for a 'proof of concept' is key to convince more stakeholders, while a clear governance and policy is necessary to specify the framework. Tubbax & Peeters (2023) further elaborate on this.

### *3.3. Example: learning spaces 'ninja' action to trigger cultural change*

During a LESEC 'When ideas…' session on learning spaces in February 2022, the idea arose to not wait for new high-level collaborative learning spaces to be developed, but to change a traditional seminar room into a low-level active learning classroom simply by moving furniture to a group-work arrangement. The ambition was to break the vicious circle described by Peeters & Binnard (2018): the lack of use of innovative teaching practices reduces the demand for new and flexible rooms, which reinforces the traditional habits of teachers. This 'ninja' action bypassed KU Leuven procedures, but by organizing a close follow-up of didactical teams through information charts and a local contact person, the plan worked. Locally, lecturers are now asking for a second, similar active learning classroom. Centrally, this is picked up by the involved stakeholders and triggers structural change in available learning spaces.

This example shows that an informal brainstorm session can induce disruptive bottom-up change, causing a complex interplay between different levels involved, leading to related top-down actions. Informal actions can thus help to lower resistance to cultural change. However, effects remain prone to the goodwill of a few innovators and need time.

## 4. Conclusions

Higher education can no longer avoid a disruptive innovation due to the emergence of online learning as well as the evolved expectations of society concerning skills and attitude of graduated students (Christensen & Eyring, 2011). However, this paper confirms that (digital) transformation in a higher education institution is a challenging process and shares some insights from KU Leuven (Belgium). Several examples show that a workforce and technology change can be induced by a coordinated, project-based approach in which different levels are involved and coordinated. Pedagogical action research is a valuable method to feed practice as well as theory. However, a culture change is most difficult and requires more than a project-based approach. After all, people, cooperation and willingness to change became more important than following a plan. The combination of bottom-up and top-down initiatives in one continuous PDCA-cycle is crucial, aiming for mutual goals. The world is changing faster than ever and so should the context of higher education.

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