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## Possible Scenarios for the Future of Digital Transformations in Higher Education

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In this edited volume, our aim has been to expand the scholarly and policy debates surrounding digital transformation (DT) in higher education. We applied a broader systemic framework pertaining to multiple manifestations at various scales and involving an increasing number of internal and external stakeholders. In so doing, we followed, and further developed the work initiated by Laterza et al. (2020), pursuing DT in its plurality. Moving from DT to DTs, the conceptual framework exposed three analytical elements—contexts, mediations, and type of effects—for unpacking the manifold empirical DTs’ manifestations.

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By looking to the Nordic countries and their higher education (HE) systems, we have provided solid empirical insights on how DTs gained ground before and continued to gain ground during the years of the COVID-19 pandemic. Moreover, this volume has demonstrated how international digitalization trends, such as global EdTech platform providers, may impact the activities of HE institutions (HEIs), particularly where HE is public and funded by the governments, as in the Nordic countries.

These developments are observed at all levels and impact on technical, pedagogical, and human resource systems within and across organisational boundaries. For example, the contributions by Øvrelid and colleagues (Chapter 2) and Singh and Haugsbakken (Chapter 6) have demonstrated how the contexts of teaching and learning are exposed to DTs by offering online solutions in addition to or substitution of campus-based offerings. Both chapters highlighted the ways in which these processes existed prior to the pandemic but became more wide reaching due to the implementation of emergency remote teaching; thus, they have been subject to far more debate during the COVID-19 pandemic than before. A key message from the research is that the DTs that impact the contexts for teaching and learning call for several types of change, intersecting with infrastructure, culture, and competencies. Moreover, DTs of context have been observed in traditional campus-based teaching—for example, in the ways faculty staff are expected to adopt digital technologies.

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Tømte and Lazareva (Chapter 4) showed how a specific technology-rich learning space may foster the development of digital competence for future teachers. A key message here, however, is that faculty staff would also need professional digital competence to foster this type of learning for their students. The learning space itself can only provide an appropriate context for this development. The digital competence of the people involved in the DTs processes is thus seen as crucial (a necessary condition) for HEIs if they are to succeed in taking advantage of the investment in new contexts for teaching and learning.

The second critical feature, as suggested in the framework on DTs, is connected to how sub-systems may play a mediating role at the system level. As suggested by Laterza et al. (2020), the technological platforms being used within HEIs are central in this respect. De Andrade and colleagues empirically demonstrated how dominant EdTech providers are gaining ground on a global scale and have become even more dominant during COVID-19 due to remote online teaching and closed campuses. In the Nordic countries, HEIs had a solid pre-existing digital infrastructure, including learning management platforms, and were thus well prepared to transfer their teaching to online remote settings, as sketched out in Chapters 2, 5, 6, and 7. However, as suggested by Barman and Weurlander (Chapter 7), these sub-systems may also hinder innovation in teaching and learning, as they allow for other types of narrower knowledge domains to be assessed which often differ from those preferred or initiated by the faculty staff themselves. The mediating role of these sub-systems of digital platforms may thus allow for new ways of teaching and learning, but these developments should be closely followed, as they may cause unintended effects that have not yet been foreseen—for example, they may change the subjects themselves, as demonstrated by Øvrelid and colleagues (Chapter 3) and Tømte and Lazareva (Chapter 4), or they may limit proper assessments, as in the case outlined by Barman and Weurlander (Chapter 7).

The various impacts of or effects caused by digital transformation are referred to as the third critical feature of our proposed DT framework. One could argue that all chapters in the present volume address different types of DT effects at multiple levels within HEIs. For example, the impact at the organisational or meso level was observed by Hermansen and Lund (Chapter 6), wherein the authors empirically demonstrated how various systems are becoming coupled in new ways due to digitalisation,

which thus may cause sustainable changes across entire organisations. Furthermore, at the micro level, digital technology has caused epistemic changes in disciplines and/or subjects (see Øvrelid and colleagues, Chapter 3; Tømte and Lazareva, Chapter 4; and Wollscheid et al., Chapter 10), as well as in assessment practices (Barman and Weurlander, Chapter 7). A more overarching epistemic change within HEIs resulting from digital transformations has been recognised as a change from education to ‘learnification,’ as suggested by de Andrade and colleagues (Chapter 2). Within this framework, it is argued that one key trend, which is also closely linked to the increasing use of digital platforms, can provide a narrower understanding of ‘learning’ in terms of just tracing, and analysing distinct learning activities. This approach may or may not accurately reflect with the common understanding of ‘education,’ which also includes elements of the social perspectives of learning, elements of *Bildung*, and what are often framed as twenty-first-century skills (including collaboration, creativity, communication, and critical thinking) (Pearlman, 2010). Singh and Haugsbakken (Chapter 6) further discussed this dilemma in their case study of an institutional MOOC offering.

Another critical empirical insight emerging from the contributions in this volume is the salience given to the complexity of DTs in HE. To unpack some of this complexity, we adopted a framework outlined by Laterza et al. (2020), who suggested the use of three analytical lenses—contexts, mediations, and effects. The empirical contributions comprising this volume have clearly demonstrated that the three lenses may be useful for illustrating the multitude of transformations that is at play within HEIs at multiple (nested) levels. For example, governments and universities might hold various perceptions of digitalisation. Degn (Chapter 9) demonstrated that even if digitalisation is acknowledged within the Danish HE system and domestic providers at a general level, little effort is put into implementing digitalisation as a policy idea as part of the steering mechanisms between the government and HEIs. De Andrade and colleagues (Chapter 2) pointed at the same observation when they identified various dominant or hegemonic narratives on HE digitalisation. Moreover, Hermansen and Lund (Chapter 5) showed how actors who relate to diverse systems may be coupled with a joint understanding of digitalisation within a faculty. Furthermore, Laterza and colleagues (Chapter 11), in their study of one HEI in Norway, demonstrated how faculty staff hold various perceptions of the DTs of teaching, as well as how these perceptions substantially vary from those held by

internal leaders at different levels, suggesting a misalignment between experienced realities and future expectations, including the teaching and learning performance of students and staff.

This multitude of perceptions as to what constitutes DTs was found to vary across levels and amongst individuals within HEIs, including according to the three analytical lenses composing the proposed framework for DTs. These findings, albeit cautionary and tentative, nonetheless validate the importance associated with systemic and pluralistic assessments that take into account not only multiple sub-systems within HEIs but, equally importantly, the complex inter-relationships, both existing and emerging, amongst them. When applying the analytical framework of DTs in HE in various empirical contexts, as in the present volume, a great multitude of practices and perceptions have emerged. These include valuable insights that all call for further study within and beyond the Nordic context. Undoubtedly, to obtain a more coherent understanding of these developments and their multiple impacts within HEIs and HE systems alike, various disciplines (both working alone and integrated within one another in an inter-/multi-disciplinary fashion), theoretical lenses, and scientific methods are required. The present volume makes a first attempt in this direction, acting as a stepping stone towards integrated, multi-level, and multi-proposed DTs in the HE research agenda.

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