

# Critical Aspects of a Higher Education Reform for Continuous Lifelong Learning Opportunities in a Digital Era

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**Abstract:** In the knowledge society today, there is a strong need for providing continuous lifelong learning opportunities. Recently, the Covid-19 pandemic has acted as a catalyst for technology enhanced learning, involving new challenges for higher education. The main focus for this study has been the ongoing reform of higher education for providing lifelong learning opportunities. This study is the second phase of a Delphi study on higher education reform. Data were gathered by email interviews with an expert panel, where all respondents have genuine knowledge in the field of technology enhanced lifelong learning. The interview answers were analysed according to the Grounded Theory concepts of open coding and axial coding. The central main category for the axial coding was 'Higher education reform for the provision of lifelong learning opportunities. This category was later found to be dependent on 'Infrastructure', 'Multimodal delivery', 'Pedagogical change', 'Financial aspects', and 'Quality and organisation', 'Digital literacy', 'Accessibility', and 'Equity, diversity and inclusion'.

**Keywords:** Lifelong learning, Higher education, Higher education reform, Technology enhanced learning, Inclusive education, Accessibility

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## 1. Introduction

Following the outbreak of the Covid-19 pandemic, the provision of lifelong learning opportunities has increasingly become a topic of discussion in higher education (Rashid and Yadav, 2020; Atchoarena, 2021; Nuankaew and Nuankaew, 2021). For many educational institutions, the pandemic also involved an increased application of digital technologies to support learning (Rashid and Yadav, 2020; Ivenicki, 2021). Nevertheless, the pandemic as a driving force for higher education development is just a recent driver for change (Atchoarena, 2021). The digitalisation of society and the sector has been going on for decades and is part of what some scholars call the learning society (e.g., Jarvis, 2007) and some call the knowledge society (e.g., Peters and Romero, 2019). This ongoing shift to a knowledge society requires professional development of higher education teachers and reskilling and upskilling that preferably should be technology-enabled (Matheos and Cleveland-Innes, 2018). Providing lifelong learning opportunities and its role in the higher education system needs to be rethought, including new forms or educational designs adapted to a digital era (Zgaga, et al., 2019). These new forms of educational designs have been introduced over time and often include formal, non-formal and informal aspects of lifelong learning from a life-wide perspective (Roche, 2015; Burbules, Fan and Repp, 2020).

The provision of lifelong learning opportunities has also been linked to societal development. This has resulted in countries all over the world, as well as transnational organisations, involving supporting the development of lifelong learning initiatives in their higher education policy documents (Volles, 2016; Bostrom, 2017; Lee and Jan, 2018). Jaldemark (2021), for example, reports various motives for the inclusion of the urge to develop lifelong learning initiatives in these policy documents such as social development, increased employability, global competition, and sometimes also the aspect of personal development. Schuetze and Slowey (2020) report that the reform of the current higher education system appears to be in focus in most policy documents, which aim to open up new opportunities for developing lifelong learning initiatives. For example, the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) suggests a wider and broader approach: "the right to education needs to be broadened to be lifelong and encompass the right to information, culture, science and connectivity" (UNESCO, 2021, p. 4).

From the higher educational perspective, digitalisation changes the conditions for educational design, teaching, learning and communication between humans. Therefore, ongoing reforms with policy development connects

to yet another global societal trend, i.e. the rapidly emerging digitalisation. Digitalisation can also be said to intersect with the new stronger focus on providing lifelong learning opportunities. Therefore, the new conditions provided by digitalisation enable lifelong learning opportunities through new innovative ways of considering the combination of places and time modes to facilitate the idea of anyplace and anytime learning (Cook and Grant-Davis, 2020; Varghese and Mandal, 2020). Thus, digitalisation has a strong impact on educational systems in general, particularly in higher education. The creation of innovative and transformative lifelong learning opportunities supports and enables both asynchronous and synchronous teaching and learning activities in formal, informal, and non-formal educational settings (Jaldemark, 2021; Matheos and Cleveland-Innes, 2018).

In the ongoing discussion of the reform of higher education, digitalisation and the provision of lifelong learning opportunities are common themes. Policies are one approach to supporting this reform. Here, policies highlight the need to be up-to-date with regard to the impact of digitalisation on working life. The role of Higher Education (HE) is also important in societies in change. This change has brought forward ideas for reforming the role of higher education both in national educational systems and on a global level. Recently, the Covid-19 pandemic has further accentuated the need for fully online solutions and, therefore, a richer technology enhancement of higher education (Carius, 2020; Mozelius, 2020). This educational shift requires new pedagogical ideas and collaborative learning approaches to support learning and lifelong learning processes. A stronger emphasis on lifelong learning initiatives in policies and emerging digitalisation creates new conditions for providing lifelong learning opportunities for 21st-century citizens.

In light of the rising emphasis on providing lifelong learning opportunities and digitalisation, this paper aims to explore and analyse the ongoing reform of higher education. The following research question was posed: *What are the critical aspects of higher education reform for the provision of lifelong learning opportunities in a digital era?*

## 2. The Reform of Higher Education and the Provision of Lifelong Learning Opportunities

To update and reform higher education and providing lifelong learning opportunities is a global ongoing process, with a need for adapting to both new pedagogies (Alt and Raichel, 2022), as well as to new digital technologies (Rawas, 2023). Moreover, the stronger emphasis on providing lifelong learning opportunities as a task for higher education also implies preparing students at regular university programs to be lifelong learners, including capabilities to meet the demands of changes in their future lives and a meta-cognitive capacity to understand their own learning process (e.g., Blaschke, 2021; Lock, et al., 2021). However, reforming higher education by emphasising lifelong learning opportunities also includes adapting activities to groups other than the full-time students at regular university programs. For example, triple helix collaborative activities with organisations in the surrounding society (e.g., Vivar-Simon et al, 2022) or by offering flexible courses adapted to students that combine studies and work. In effect, continuous lifelong learning opportunities in different forms for those who already have an academic degree. These opportunities go beyond regular university programs and reach out to former higher education students and the organisations they belong to. Here, higher education initiatives to provide lifelong learning opportunities can contribute to organisational development through reskilling and upskilling workers. These higher education lifelong learning opportunities are sometimes also discussed in terms of professional development (e.g., Amhag, Hellström and Stigmar, 2019; Russell, et al., 2022) or participating in continuous education (e.g., Longhini, Rossettini and Palese, 2021).

At the same time, the concept of lifelong learning has a long and interesting history involving different narratives (Field, 2011; Kitto, 2022). In the late 18th century, Condorcet (1992/2003) introduced the notion of lifelong learning by building on Plato's (n.a.) idea of supporting learning through the lifespan and Comenius's (1657/1896) idea of education for all. Condorcet emphasised that education should expand beyond formal education, be for all ages and all citizens and go beyond the social position in society and educational background. It should educate people for both practical and professional purposes. This democratic and humanistic perspective of lifelong learning emphasises lifelong learning as an emancipatory process that should strengthen human beings and their capacities and participation in a democratic society (e.g., Jaldemark, 2023; United Nations Educational, Scientific, and Cultural Organisation, 2021). In the 20th century, global organisations and nations emphasised an economic perspective, including the emergence of the provision of lifelong learning opportunities for the masses. This economic perspective focuses on taking positions and being competitive in the global market. Therefore, lifelong learning initiatives and policies from an economic perspective aim at making citizens employable and available to the working market (e.g., Jaldemark, 2023; Organisation for Economic Co-operation and Development, 2021).

The link between higher education, digitalisation and the provision of lifelong learning opportunities is an ongoing process that was established before society was hugely infused by digital technologies (e.g., Jaldemark, 2021; Knapper, 1988). The reform of higher education with digital technologies has its roots, at least in technological development initiated in the early 19th century. To bridge time and place, analogue technologies have been included in educational designs to reform higher education, making higher education accessible to more students. In the 19th century, postcards and letters were included in higher education designs – called *correspondence teaching* – to bridge time and space and enable learning from a life-wide and lifelong perspective (Holmberg, 1960; Pittman, 2003). Later, mass media technology such as radio and television were added as tools to enable participation in higher education based on the idea of providing lifelong learning opportunities (Mclsaac and Gunawardena, 1996). However, the addition of these technologies had some communicative pitfalls. Support for providing lifelong learning opportunities and fast two-way communication between teachers and learners were not ideal while these technologies were either slow, asynchronous two-way technologies such as letters or fast inflexible one-way synchronous technologies. The addition of internet-based digital technologies to reform higher education settings at the end of the 20th century provides opportunities for lifelong learning by affording flexible two-way synchronous and asynchronous communication.

### 3. Methods and Materials

This study was the second step in a larger, three-step Delphi study about the contemporary reform of higher education capacity to initiate and provide lifelong learning opportunities. The Delphi study design was inspired by the method outlined by Brady (2015), and involved a panel of informants (N=8) with expertise in the field of lifelong learning. In the first step, the members of the Delphi expert panel answered an online survey with five-graded Likert-scale questions. A summary of the survey results was used to create email interviews comprised of open-ended questions on the topics of lifelong learning, higher education reform, technology enhanced learning, instructional design, and pedagogy.

#### 3.1 Reading Assignment

The first phase of the research, a literature study, is described in detail in Håkansson Lindqvist et al. (2020). This phase was carried out as a systematic review of foundational and currently published literature on higher education reform for lifelong learning. Out of a first result set of 26 articles, five articles were selected by the authors. This selection was the result of reducing the number of articles with similar themes in order to offer as a knowledge base for the experts. The five articles are listed in Table 1 here below.

**Table 1: Selected publications and their main themes.**

Publication and authors	Main themes
Santos, L., Bago, J., Baptista, A. V., Ambrósio, S., Fonseca, H. M., and Quintas, H. (2016). Academic success of mature students in higher education: a Portuguese case study. <i>European journal for Research on the Education and Learning of Adults</i> , 7(1), 57-73.	Presents European lifelong learning policy for economic development, personal development, social inclusiveness and democratic understanding
Kasworm, C. (2020). Adult Workers as Learners in the USA Higher Education Landscape. In <i>Inequality, innovation and reform in higher education</i> (pp. 221-235). Springer, Cham.	Discusses a rethinking of the mission of higher education with a specific focus on adult undergraduate students who more often are both workers and students
Boyadjieva, P., and Ilieva-Trichkova, P. (2018). Lifelong learning as an emancipation process: A capability approach. In <i>The Palgrave international handbook on adult and lifelong education and learning</i> (pp. 267-288). Palgrave Macmillan, London.	Presents a theoretical outline of the heuristic potential of the capability approach in conceptualising lifelong learning and the capacity of this approach to guide empirical studies on lifelong learning
Weil, M., and Eugster, B. (2019). Thinking outside the box. De-structuring continuing and higher education. <i>Disciplinary Struggles in Education</i> .	Promotes a stronger relationship between higher education research and continuing education training (CET). More collaborative engagement between higher education and CET is necessary to include the importance of an applied, practitioner research in professional fields

Publication and authors	Main themes
Jamaludin, R., McKay E., and Ledger, S. (2020). Are we ready for Education 4.0 within ASEAN higher education institutions? Thriving for knowledge, industry and humanity in a dynamic higher education ecosystem?. <i>Journal of Applied Research in Higher Education</i> .	Presents challenges that have been identified in higher education and the need for a new dynamic higher education ecosystem. The concept of Education 4.0.

The five articles were sent to the experts for reading. Consistent with the Delphi research of Lock et al., (2021), “selected readings were chosen based on research accuracy, conceptual clarity, and citation records” (p. 1654). These articles provided a knowledge foundation as a point of preliminary reference from which experts would begin conceptual exploration of the topic. While the traditional Delphi method has “been useful in educational settings in forming guidelines, standards, and in predicting trends” (Green, 2014, p. 1), the complex nature of education reform has led to adjustments in the Delphi process. For example, in a study by Mirata et al. (2020), a four-step Delphi design was used and included a preliminary topic workshop as foundational knowledge for the Delphi experts involved.

After the completed reading, the experts were asked to complete an email interview on lifelong learning and higher education. A summary of the survey results was used to create email interviews with open ended questions on topics such as lifelong learning, higher education reform, technology enhanced learning, instructional design and pedagogy.

### 3.2 Data Collection

The data were gathered by email in which eight selected experts on lifelong learning answered a questionnaire with seven open ended questions. The experts were selected in a purposive expert sampling (Rai and Thapa, 2015) with informants that all have long and rich experience of research on lifelong learning. At the same time, the experts come from a wide geographical spread, representing five countries and three continents. This geographical spread contributed to variations in socio-cultural contexts. To inspire the experts, they were given a reading assignment with five articles that was the result from an earlier literature study on the provision of lifelong learning opportunities and higher education.

### 3.3 Data Analysis

An investigator triangulation approach to thematic analysis was the primary approach in the data analysis. The authors used 'triangulating analysis' to find relevant themes based on codes and subcodes identified in the interview answers. Investigator triangulation has been described by Patton (2002, p. 560), as ‘having two or more persons independently analyse the same qualitative data and compare their findings’. In the first analysis phase, two of the investigators conducted their separate analysis with the idea of open coding as described by Khandkar (2009). In the open coding phase, researchers fracture data into discrete parts and thoroughly examine the parts to identify data extracts, codes, and potential categories. In the second phase axial coding was used. The concept axial coding relates to ideas in Grounded Theory (GT) and is defined as: ‘coding that treats a category as an axis around which the analyst delineates relationships and specifies the dimensions of the category’ (Bryant and Charmaz, 2007, p. 603). In this study, the identified data was reassembled into more abstract conceptual categories with relationships between the categories.

## 4. Findings

In this section, the findings are presented. First, the process of open coding is presented. Thereafter, the axial coding process is presented. Examples are provided for illustration.

### 4.1 Open Coding

In the Open Coding process, the first step was to review the email interview answers, and to break them down in smaller pieces for close reading. This was done in order to compare relations, similarities, and dissimilarities. Relevant data extracts were colour coded and marked with appropriate labels to facilitate further analysis. In this first step that Khandkar (2009) refers to as ‘building concepts’ as depicted in Figure 1.

1) Based on the pandemic-based experience using technology in education please describe what you believe will be drivers for change post-pandemic?

I always teach online so my pandemic-based experience was little changed from normal. I have learned new uses and greater appreciation for real time video exchanges. I believe from what I have heard from colleagues and read in journals that faculty are starting to understand the importance of communicating social presence among instructors and students, something I have long studied. I also believe many faculty have new appreciation for the need to be familiar with a variety of technologies. Some have a new appreciation for online learning, and some, those who didn't learn about social presence in particular, had their poor opinions of online learning confirmed. I would guess that drivers for change post-pandemic will be mostly fiscal – administrators will try to save money by hiring more adjuncts to teach set courses and offering competency-based and adaptive learning systems, and/or they will use predictive analytics to increase enrollments and retain more students.

Figure 1: Colour coded data extracts or subcodes from the email interview answers

These colour coded data extracts or subcodes were then aligned to code labels as illustrated in Figure 2 below.

- 1 Pedagogy / Instructional design/Content development
- 2 Economy / Financial aspects
- 3 Technology Enhanced Learning /Blended learning/(MOOC)
- 4 Transformation of Higher education / Lifelong learning/Definitions
- 5 Work-integrated learning / Collaboration with society
- 6 Assessment/ Learning outcomes/Capacity building (related to 1 & 3)
- 7 Aim/Outcomes Rewards/Certificates/Credits/ (related to 1 & 6)

Figure 2: Related codes colour coded for creating preliminary categories

In the second step, 'abstracting the concepts', the further analysis process is to group codes into relevant concepts or categories. The labelling can be decided either by the analyser or can be taken from the analysed content (Khandkar, 2009). Here, in the second step the authors discussed the two different analyses to compare the similarities, dissimilarities and relations which were found. Following this the two different Open Coding analyses were sent to a third investigator in the research team for further analysis involving comparison and merging. After this additional step of analysis, further discussions took place and the codes and subcodes were grouped into preliminary categories. One example is presented in Figure 3.

<p><b>Pedagogical change</b></p> <p>Codes:</p> <p><b><i>Pedagogy - Instructional design – Interaction - Social presence – Learner centred design</i></b></p>
<p>Subcodes / Data extracts:</p> <p>Improved learning design based on affordances of digital technology/ digital interaction instead of converting f2f modes into digital pedagogy.</p> <p>have transformed their pedagogy to make it more focused on students' learning, by using in their course synchronous and asynchronous activities. They also were able to provide their students with the advantages described in the literature on blended and online courses: flexibility, accessibility, complementarity between synchronous and asynchronous activities</p> <p>using pedagogical approaches such as problem-based or project-based learning by integrating technologies and in particular Internet research. However, in some developing countries, these resources are weaker or even non-existent</p> <p>problem-based or project-based learning, emphasize the acquisition of skills and</p>

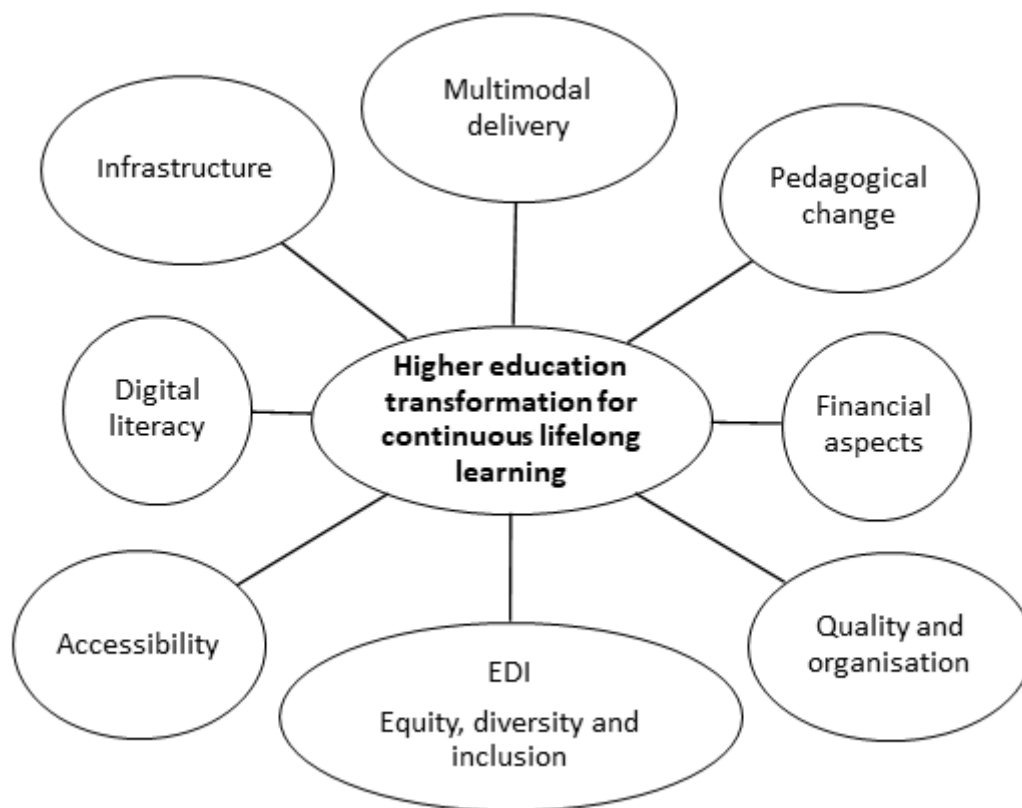
Figure 3: Preliminary categories aggregated by codes and subcodes

In the conducted Open Coding process, codes initially emerge from the raw data, and that they later were grouped into conceptual categories or themes. As pointed out by Khandkar (2009, p. 8): “The goal is to build a descriptive, multi-dimensional preliminary framework for later analysis. As it builds directly from the raw data, its process itself ensures the validity of the work.” Regarding the later mentioned analysis, this was conducted as an Axial Coding outlined by Vollstedt and Rezat (2019).

#### 4.2 Axial Coding

A characteristic of the GT approach is that data collection, data analysis, and theory development are not separate and successive steps in a research study, but rather intertwined and interdependent in an iterative process (Vollstedt and Rezat, 2019). As described by Strauss and Corbin (1990), axial coding is an analytic process to investigate the relationships between the categories that developed earlier in the open coding process. In other words, after that data were divided into separate categories in the open coding process, they are then joined together or assembled in a new way in the axial coding process aligned around respective central categories.

The focus of axial coding should be on one category (the phenomenon), with relations and dependencies to the other categories. Whether the research is about individuals, groups or collectives, there are always actions and interactions directed towards the phenomenon (Vollstedt and Rezat, 2019). The found phenomenon, and the central category in this study was ‘Higher education reform for the provision of lifelong learning opportunities’ with a dependency on the categories of ‘Infrastructure’, ‘Multimodal delivery’, ‘Pedagogical change’, ‘Financial aspects’, and ‘Quality and organisation’ on the general higher education level. On the individual level the important found categories, or aspects, were ‘Digital literacy’, ‘Accessibility’, and ‘Equity, diversity and inclusion (EDI)’ as depicted in Figure 4. Despite what appears to be a linearity in this process, the analysis, coding, and categorization was a dynamic, iterative, and nonlinear process.



**Figure 4: Critical aspects of Higher education reform for the provision of lifelong learning opportunities**

The overarching theme referenced for the axial coding is ‘Higher education reform for the provision of lifelong learning opportunities’. This overarching theme or category is seen to be dependent on the following related themes or categories: ‘Infrastructure’, ‘Multimodal delivery’, ‘Pedagogical change’, ‘Financial aspects’, and ‘Quality and organisation’, ‘Digital literacy’, ‘Accessibility’, and ‘Equity, diversity and inclusion (EDI)’ which are all described in the discussion section.

## 5. Discussion

The identified categories are discussed in detail here below, starting with the central category 'Higher education reform for lifelong learning'.

### 5.1 Higher Education Reform for Providing Lifelong Learning Opportunities

The phenomenon, or the central category, that the axial coding focused on was Higher education reform for providing lifelong learning opportunities. This is a merge of the earlier category of 'lifelong learning' and the subcategory of "Reform of higher education", The earlier 'Infrastructure' part of Reform of higher education later became a category of its own. Many experts identified the pandemic as a catalyst for this transition, and as stated by one of the interviewees *"I think we have learned a number of important lessons during the pandemic, some of which provide insights about future drivers for change in HE"*.

Another transitional driver mentioned by the experts were the new demands of society and the labour market, with huge needs for reskilling and professional development. One of the experts highlights the need for a more demand driven provision of lifelong learning opportunities, and to "increase research-led education to focus on innovation, increase engagement, and focus on capability". Moreover, one expert brought up climate change as a driver that *"will continue to be a backdrop for many initiatives, policy shifts, et cetera"*. Another driver for transition is that higher education lifelong learning initiatives will use more of digital technology in the future, but as claimed by one of the experts:

*"I don't think it's wise to say that technology is itself a driver. Better to say that improvements in the capabilities of affordable digital devices + enhancements to networking infrastructures are entangled with changing habits and expectations."*

However, technology enhancement is an ongoing process. Another issue that emerged is enrichment of traditional education with other experiences such as project work, work-based experiences, and the idea of work integrated learning. Another trend is the request for shorter courses, modular degree structures or so-called micro credentials. There was also a remark on non-credit offerings and Massive Open Online Courses (MOOCs), that these phenomena already are pushing the boundaries between the academy and industry with the aim of 'job readiness'.

Recommendations in the interview answers included *"Be clear about the added value of education in the context and meaning of lifelong learning. Re-define what educational institutions are in the context of emerging corporate training and industry academies"*. Another suggestion was *"favoring the integration of practice into training, such as, internships in companies or in the industry, projects carried out in partnership with industry and joint supervision between university faculties and professionals"*, and to *"focus on both the development of the canonical knowledge required, for instance a set of occupational capacities, but also some variations of how that knowledge will be applied, for instance in a particular workplace setting."*

The discussions also suggested that opening up the university to a hybrid model where the professional development is built around the true and evolving needs in organisations and companies. An example of a constantly evolving field was healthcare, with a need for expanding the possibilities to be part of lifelong learning initiatives and the fact that *"healthcare workers must keep up to date with this new knowledge, and must quickly integrate it into their practices"*. The recommendation from one of the experts was to build around *"these kinds of activities that individuals face every day in their working life, and having the capacities to respond to them both those that are routine and those that are non-routine"*. The panel experts pointed out many challenges in the transition to lifelong learning opportunities in higher education, however, there are positive expectations in the spirit of *"the deeper structures and values of lifelong learning as well as the long history of how to do technology-enhanced learning in ways that foster human flourishing, learning fulfilment and worth-while fusions of academic and professional development"*.

To foster human development, one of the experts suggested that *"we involve both lifelong education for employability and lifelong learning for personal development."* This should be *"thought about in ways that encompass the whole life course"*, and with the idea of enriching daily life and to empower learners. The two aspects should better be combined, and as expressed by an expert: *"on the one hand, functional lifelong learning in the form of upskilling with a focus on socio-economic value, and, on the other hand, personal lifelong learning in the form of 'life-world becoming'"*. Several experts raised the idea of human centred lifelong learning opportunities, where one of them recommends:

*"Putting human flourishing before efficient or smart tech set-ups, worth-while learning before technological upskilling of the workforce the deeper purpose of lifelong learning before the construction of massive technology-enhanced lifelong learning courses."*

## 5.2 Infrastructure

The reform of higher education for providing lifelong learning opportunities is clearly dependent on the reform of infrastructure to establish an *"open learning environment where new formats, forms and formations emerge"*. One expert suggested *"Hybridizing learning experiences and interactions through opening up learning environments for the public"*, with lifelong learners *"participating in courses with people in different roles, contexts and localities or having institutions that are open to all and offer valuable knowledge or products for the public"*. This transition has already started at many universities, even if educators still meet *"the idiotic but often repeated claims that university education hasn't changed since the middle-ages"*. The attitudes are of course different in different parts of the world, and many politicians and policy makers would not agree with what was occurring *"in Australia, we had a prime minister asserting that only face-to-face classes really 'count' as education; 'screen time' is wasted time"*. There are certainly advantages with technology enhanced learning with global aspects such as *"educational provision for international students interacts in an interesting way with use of online/blended learning"*.

Other opportunities with a thoughtful and technology enhanced redesign of the infrastructure might be the *"development of a computed curriculum and further automation of the delivery of education"* and that this would *"likely further increase in the area of educational consumption and supply driven individualised learning pathways"*. However, the aim must be to combine individualisation with new forms of collaborative learning support for *"technological systems and tools to technology-enhanced learning communities. The question is here how to foster technology-enhanced places for lifelong learning that 'vibrates' and make learners flourish"*. Several experts mention that technology and the general digitalisation of society will change the way higher education learning is practised and produced. One interview answer brings up the Economic Co-operation and Development (OECD) vision from 2020 for education systems in the future, a vision that involves four alternative scenarios: schooling extended, education outsourced, schools as learning hubs, and learn-as-you-go. Each of these scenarios would require infrastructural changes, where:

*"The first two scenarios would require less reform of the school system, while the latter two would require greater change in how we design and deliver education — and unless institutions are able to adapt agilely to this change, other providers will step in to fill the gap."*

## 5.3 Multimodal Delivery

What could be seen as an extension of the previous category of Infrastructure is a multimodal delivery that further supports the idea of helping learners flourish. Technology-enhanced learning requires content development, instructional design, and rich media tools that facilitates what one of the panel experts summarises as *"feasible e-learning activities in both fully online and blended models"*. The Covid-19 pandemic has been a catalyst, and as described by another expert:

*"To me, the experience gained using digital technologies will further boost and improve the learning experience of existing trends. Where education was relatively slow to adapt and embrace digital technology, the pandemic made sure they (had to) catch up."*

Recommended was the idea that *"technologies should be ubiquitous in higher education"*, to support various modalities in teaching and learning activities. Multimodality is brought up in two different ways by the panel experts. First, with the idea of combining modalities such as text, sound, and images in content development and instructional design and to use rich media tools for synchronous collaborative online activities. Several experts mention the importance of *"familiarity with web-based videoconferencing"*, and positive experiences such as *"I have learned new uses and greater appreciation for real time video exchanges web-based videoconferencing"*. Secondly, the use of different modalities appears, as in:

*"The use of blended and online courses, higher education institutions will continue to use these modalities, perhaps not to the same extent as during the pandemic, but should increase their use as compared to the period before the pandemic"*

The interview data show expectations such as *"that technology-enhanced lifelong learning will be a disruptive technology"*, and *"course modalities allowing better accessibility of higher education to students, especially for those living outside big centers"*. Moreover, a multimodal delivery could involve reflective learner activities such



as "knowledge acquisition by the means of e-portfolios". Finally, another extension of the infrastructure category and another is the concept of a hybridised networked learning. As with many other suggestions for higher education to provide reinforced technology-enhanced lifelong learning (TELL) opportunities this would, as one of the experts states, require "a (re)opening of TELL as process, practice and learning environment".

#### **5.4 Pedagogical Change**

The suggestions for a new technology-enhanced and multimodal instructional design in the previous category leads to a need for a new adapted pedagogical design. This category was aggregated from the found themes: Instructional design, Learner centred design, Interaction, and Social presence. Other concepts found in the experts' interview answers were *"using pedagogical approaches such as problem-based or project-based learning by integrating technologies and in particular Internet research"*. Problem-based or project-based learning are concepts that seem suitable for providing lifelong and work-integrated learning opportunities while they *"emphasize the acquisition of skills and competencies (rather than knowledge) and permit students to "learn to learn" throughout their lives"*.

Several experts highlight the importance of a learner centred design, and to avoid the *"reproduced/recycled misconceptions about higher education practices, including by assuming/asserting/implying that lectures are the main/only form of teaching and that teaching-learning is mainly a matter of transmission"*. Another expert encourages higher education institutions *"to rethink not only their delivery of teaching and learning, but also their design of that teaching, shifting to more learner-directed, learner-entered forms of education"*. This debate is not new, and many higher education institutions:

*"have transformed their pedagogy to make it more focused on students' learning, by using in their course synchronous and asynchronous activities. They also were able to provide their students with the advantages described in the literature on blended and online courses: flexibility, accessibility, complementarity between synchronous and asynchronous activities"*.

To create synchronous and asynchronous learning activities of quality requires an *"increased competence creating and validating digital products and increased capacity for assessing validity of digital resources"*, with a *"need for learning designers to help faculty with existing and emergence online learning"*. On one hand, it was pointed out that *"providing an accessible medium in some ways, is also restricted in its pedagogical capacities"*, on the other hand an expert believed *"that good pedagogies, good teachers, will set learners on a path to lifelong learning regardless of technologies"*. The themes of Social presence and Interaction matter in the design of virtual learning environments, and one recommendation was that *"it's never too early to start learning how to configure your own learning environment"*. Others suggested to address this challenge by *"communicating social presence among instructors and students"*, and to develop an *"improved learning design based on affordances of digital technology/ digital interaction instead of converting f2f modes into digital pedagogy"*.

#### **5.5 Financial Aspects**

Many of the interesting and creative ideas that can be found in the categories above need funding. One expert claimed that *"learning that is accessible anytime/anywhere increases access and can reduce cost of formal education"*. Courses could be given at a reduced cost, but high-quality education must initially invest in the creation and alignment of quality content, and a structured course design. In reference to course content, the same expert recommends an *"increased production and distribution of open education resources (OERs) and research articles that are licensed under Creative Commons licenses"*. Another expert describes a future where:

*"Administrators will try to save money by hiring more adjuncts to teach set courses and offering competency-based and adaptive learning systems, and/or they will use predictive analytics to increase enrolments and retain more students"*

The experts in the Delphi panel live in different countries on three continents. Their concerns regarding financial aspects show differences from remarks such as *"The neo-liberal motivated cuts to government support to higher education are forcing ever increasing tuition rates"*, to answers without comments on the topic. While the European experts show less concern, the situation in Australia seems to be different:

*"Australian universities have acted very swiftly to cut their cost base (e.g. by 'letting go' many thousands of casually-employed teaching staff) and are revising projections about future revenue"*.

Another, more international threat that was mentioned in this answer concerned *"the rapacious appetites of venture capitalists, the naiveté of the CEOs of ed tech startups"*.

A theme emerging from the data identifies internationalisation and export of online courses as a way to finance course development and the transition to provide lifelong learning opportunities. One of the experts depicts the problem in a different way: *"to exclude universities from economic stimulus measures; has castigated universities for being so 'reliant' on international students (a strange way to talk about a successful export industry)"*. Different conditions exist in different countries, but share the global idea that the *"growth of international student numbers (and revenues) has been an important element in university planning and finances"*. Finally, some remarks on the student perspective are that *"Our students will be the biggest drivers of change"*, and that:

*"Students live and study in one of the country's 10 or so large cities – usually the city in which they've grown up – and that many of them, for financial reasons, continue to live with their parents, and engage in many hours per week of paid work"*.

Thus, the student perspective was considered as a driver of change.

## 5.6 Quality and Organisation

Several aspects of quality and organisation were found in the answers. From the learner perspective, two trending concepts emerged: micro credentialing and experiential learning. Older, full-time working target groups require education built around learning by doing, learners' earlier knowledge, and a reduction of standard 7.5 ECTS courses into smaller chunks. A recommendation from one panel expert was to use *"learning analytics and AI modelling to support learners"* and to create learning profiles. This expert continued by saying that change would require new models for assessment and evaluation *"by turning away from three to four major assessment points throughout the year, into following learning gains on a much more regular and finer grained basis"*. Another expert suggestion was non-credit offerings implemented as MOOCs, and that *"these are already pushing the boundaries between the academy and industry"*.

A criticism of MOOCs that links to the category EDI is that the *"MOOC use is largely not from those who have been denied opportunity for continuing formal education, but rather most often used by already educated"*. There are also recommendations that MOOCs and their digital content needs evaluation and quality assurances, and that the OERs that were part of the previous category might be useful here. From the teacher perspective, a suggestion that might not be embraced by all academics is that *"reward and promotion for academics needs to shift less on publication to quality of teaching and especially online teaching"*. The theme of internationalisation was mentioned as a risk, but also with the possibility that *"programs in a different country or cultural context can be seen as being powerful and exposing the learner to new and diverse experiences"*.

A theme found in several interview answers is work-integrated learning. According to one expert, we must *"take a realistic view of HE reform – one which acknowledges that universities are real work-places with real workforces whose actions are consequential"*. At the same time, there are comments about the labour market's need for upskilling should be complemented with a *"focus on the human flourishing, social cohesion, development of citizenship and individual fulfillment"*. There are different views and organisational modes to consider. One of the panel experts listed three modes. The first mode is described as an older, linear model, as *"a quality or excellence that is approved by hierarchically established peers"*. This model may not contribute to industry or the knowledge economy and is sometimes described as the *"the ivory tower model"*. The second mode is seen as *"context-driven, problem-focused and interdisciplinary research"*. This knowledge is produced in *"the context of application social accountability and quality control"* and is often described as the *"the competence factory"* which values the employability and the production of a relevant future workforce. Finally, the third mode *"emphasizes the coexistence and co-development of diverse knowledge and innovation modes"*, offering interdisciplinary and transdisciplinary knowledge. In this networked mode, according to this expert, higher education institutions and society are in dialogue and create new forms of knowledge and interconnected modes of knowledge production. According to this expert the third mode aspires to *"create deeper connections between the sectors, while respecting each sector."*

## 5.7 Equity, Diversity and Inclusion (EDI)

As one of the experts stated *"Student population will further diversify"* in the future, and that the provision of lifelong learning opportunities also will be more lifelong, and with a larger age span - from what an expert described as *"caring for children being 'home-schooled'"* to what another expert referred to as *"the elderly and especially those older citizens with less formal education and less funding to access quality tools and"*

connectivity". It is a crucial challenge to reach these new groups and also the ones that suffer from what an expert mention as citizens suffering from "effects of social and economic disadvantage".

One identified global phenomenon is that the percentage of older adults is increasing at a time when work-life needs more upskilling and reskilling than earlier. For one expert, the provision of lifelong learning opportunities "has the potential to span all age groups and educational contexts if it is mindful of and tailored to the deeper educational purposes of the context". Another expert highlighted that "older individuals have benefited little in the past from these new approaches to learning and the extensive use of technology". There are, of course, many other target groups to include, where one of the experts depicts a vision of:

*"Movements around climate action, women's rights, gender equality and Black Lives Matter (and more) - will carry this conviction into higher education and demand an education that helps them to change the world. (We saw versions of this in the late 60s/early 70s.) If such demands meet a positive response from academics who are weary of the corrosive effects of neoliberalism, then we may see alliances that will promote various forms of educational innovation and provision for more expansive forms of lifelong learning"*

As this expert noted alliances, or collaboration, will provide possibilities for education innovation and expansive forms of lifelong learning initiatives.

### **5.8 Accessibility**

Technology is a double-edged sword that, as one expert wrote, facilitates "learning that is accessible anytime/anywhere increases". On the other hand, "without access to these digital technologies, students can not have access to knowledge accessible through the web and must therefore rely on their teachers". Another expert commented that "technology-enhanced lifelong learning will be a disruptive technology". As in other technology dependent educational contexts, there will certainly be a digital divide between those who have access, and those who do not have access. Moreover, there are two different digital divides, the external between developed countries and less developed countries, and the internal digital divide inside a country or a region (Peiris et al., 2015). For example:

*"Access to these technologies is not guaranteed for everyone. Indeed, in developed countries, higher education institutions have infrastructures that allow students to have access to these technologies, which is not the case for developing countries. In addition, Internet accessibility could vary, depending on whether students are in large urban centers or in remote areas".*

Most frequently mentioned is the divide between younger and older lifelong learners.

How long is the current life of the learner? One expert points out that "the elderly and especially those older citizens with less formal education and less funding to access quality tools and connectivity" will have specific needs. Another emphasises that "older individuals have benefited little in the past from these new approaches to learning and the extensive use of technology". On the other hand, an expert mentions we must look carefully at the differences:

*"I have noticed that while younger students are often more comfortable using technology in teaching and learning, older students are more creative in their uses. It is also the case that being able to use technology well does not necessarily mean that one is able to use it to support learning."*

### **5.9 Digital Literacy**

Without digital literacy, most of the earlier features would fail. As one of the panel experts emphasised, "technology-enhanced learning will continue to increase in importance across all age groups, educational contexts". It was also pointed out that "how actively the individual engages with the experiences afforded and made sense of" will impact outcomes. This category is closely aligned to accessibility. Both digital literacy and accessibility are bottlenecks: "students (who) cannot have access to knowledge accessible through the web and must therefore rely on their teachers".

Digital literacy is close to what one of the experts referred to as readiness in:

*"An essential educational concept is that of readiness. That is, the level of knowledge individuals has to engage with what they encounter or experience. Consequently, readiness associated with engaging in technology-enhanced learning may well be a key mediating factor in terms of its efficacy".*

On the other hand, the digitalisation of lifelong learning initiatives could be seen as opening opportunities and that "technology has many affordances that support development of lifelong learning skills, specifically in making education accessible and available and in connecting learners around the globe". Suggestions for a way forward were "to strive toward using technology to support learning rather than to drive it. Learning and the learner must always be centre stage", and "then access to technologies and training in their use in terms of functionality might be useful so that such learners can look for similar functionality in the technologies of the future". Finally:

"The focus in 'technology-enhanced' is not on 'high tech' workers but on 'professional human flourishing' with and through technologies. It is 'technology-enhanced professional identities' and a life-world becoming as a professional with and through technologies, more than the learning of new technological tools, systems or skills".

Thus, this expert saw professional identities and becoming through the use of technologies.

## 6. Conclusion

In the light of the rising emphasis on the provision of lifelong learning opportunities and digitalisation, the aim of this study was to explore and analyse expert perspectives the required reform of higher education. The following research question was posed: What are the critical aspects of higher education reform for the provision of lifelong learning opportunities in a digital era? A panel of experts in the field of lifelong learning answered email interviews with open ended questions on topics such as lifelong learning, higher education reform, technology enhanced learning, instructional design, and pedagogy. The main categories that emerged in the axial coding are 'Infrastructure', 'Multimodal delivery', 'Pedagogical change', 'Financial aspects', 'Quality and organisation', 'Digital literacy', 'Accessibility', and 'Equity, diversity and inclusion (EDI)'. With the grounded theory idea of iterative cycles of data collection and analysis, the next step should be selective or confirmative coding. To develop hypotheses and theory, the results from the axial coding should be further elaborated and validated. This will be carried out in an analysis that compares the results from this study with results from two focus group interviews with the selected Delphi expert panel. There is obviously a dependency between the categories that should be revised and refined in the next step of this Delphi process.

## Declarations

Conflict of interests Authors declare that they have no competing interests. The data that supported the findings of this study are available from the corresponding author upon request.

## References

- Alt, D. and Raichel, N., 2022. Problem-based learning, self-and peer assessment in higher education: towards advancing lifelong learning skills. *Research Papers in Education*, 37(3), pp. 370–394.
- Amhag, L., Hellström, L., and Stigmar, M. 2019. Teacher educators' use of digital tools and needs for digital competence in higher education. *Journal of Digital Learning in Teacher Education*, 35(4), 203–220.
- Atchoarena, D., 2021. Universities as lifelong learning institutions: A new frontier for higher education?. *The promise of higher education: Essays in honour of 70 years of IAU*, pp. 311–319.
- Blaschke, L. M. 2021. The dynamic mix of heutagogy and technology: Preparing learners for lifelong learning. *British Journal of Educational Technology*, 52(4), pp. 1629–1645
- Boticario, J. G., Rodriguez-Ascaso, A., Santos, O. C., Raffenne, E., Montandon, L., Roldán Martínez, D., and Buendía García, F. 2012. Accessible lifelong learning at higher education: Outcomes and lessons learned at two different pilotsites in the eu4all project. *Journal of Universal Computer Science*, 18(1), pp. 62–85.
- Boyadjieva, P., and Ilieva-Trichkova, P. 2018. Lifelong learning as an emancipation process: A capability approach. In M. Milana, S. Webb, J. Holford, R. Waller, and P. Jarvis (Eds.), *The Palgrave international handbook on adult and lifelong education and learning* (pp. 267–288). London: Palgrave Macmillan.
- Brady, S. R. 2015. Utilizing and adapting the Delphi method for use in qualitative research. *International Journal of Qualitative Methods*, 14(5), pp. 1–6.
- Bryant, A. and Charmaz, K. Eds., 2007. *The Sage handbook of grounded theory*. London: Sage.
- Burbules, N. C., Fan, G., and Repp, P. 2020. Five trends of education and technology in a sustainable future. *Geography and Sustainability*, 1(2), pp. 93–97.
- Bostrom, A. K. 2017. Lifelong learning in policy and practice: The case of Sweden. *Australian Journal of Adult Learning*, 57(3), pp. 334–350.
- Carius, A. C. 2020. Network education and blended learning: Cyber university concept and higher education post COVID-19 pandemic. *Research, Society and Development*, 9(10), pp. 1–16.
- Comenius, J. A. (1657/ 1896). *The great didactic*. London: Adam and Charles Black.
- Condorcet, N. 1792/2003. Address to the national assembly, 1792. In P. Jarvis and C. Griffin (Eds.), *Adult and continuing education: Major themes in education* (Vol. I, Liberal Adult Education (Part 1), pp. 19–19). New York, NY: Routledge.

- Cook, K. C., and Grant-Davis, K. 2020. *Online education: Global questions, local answers*. New York, NY; Routledge.
- Dede, C. J., and Richards, J. 2020. *The 60-year curriculum: New models for lifelong learning in the digital economy*. New York, NY: Routledge.
- Field, J. (2011). Lifelong learning. In K. Rubenson (Ed). *Adult learning and education*, pp. 20–28. Elsevier.
- Green, R.A., 2014. The Delphi technique in educational research. *Sage Open*, 4(2), p.2158244014529773.
- Holmberg, B. 1960. *On the methods of teaching by correspondence*. Malmö, Sweden: Gleerup.
- Håkansson Lindqvist, M., Mozelius, P., Jaldemark, J., and Cleveland-Innes, M. 2020. A literature review of higher education reform and lifelong learning in a digital era. Timisoara, Romania: *EDEN Conference Proceedings 2020* (No. 1, pp. 189–197).
- Ivenicki, A., 2021. Digital lifelong learning and higher education: Multicultural strengths and challenges in pandemic times. *Ensaio: Avaliação e Políticas Públicas em Educação*, 29, pp. 360–377.
- Jaldemark, J. 2021. Formal and informal paths of lifelong learning: Hybrid distance educational settings for the digital era. In M. Cleveland-Innes and R. Garrison (Eds.) *An introduction to distance education: Understanding teaching and learning in a new era* (2nd ed., pp. 25–42). New York: Routledge.
- Jaldemark, J. 2023. Postdigital lifelong learning. In P. Jandric' (Ed.), *Encyclopedia of postdigital science and education* (pp. 1–5). Cham: Springer.
- Jaldemark, J., Håkansson Lindqvist, M., and Mozelius, P. 2019. Teachers' beliefs about professional development: Supporting emerging networked practices in higher education. In A. Littlejohn, J. Jaldemark, E. Vrieling-Teunter, and F. Nijland (Eds.), *Networked professional learning: Emerging and equitable discourses for professional development* (pp. 147–164). Cham: Springer.
- Jaldemark, J., Håkansson Lindqvist, M., Mozelius, P., and Ryberg, T. 2021. Editorial introduction: Lifelong learning in the digital era. *British Journal of Educational Technology*, 52(4), pp. 1576–1579.
- Jamaludin, R., McKay, E., and Ledger, S. 2020. Are we ready for Education 4.0 within ASEAN higher education institutions? Thriving for knowledge, industry and humanity in a dynamic higher education ecosystem?. *Journal of Applied Research in Higher Education*, 12(5), pp. 1161–1173.
- Jarvis, P. 2007. *Globalisation, lifelong learning and the learning society: Sociological perspectives*. London and New York: Routledge.
- Kasworm, C. 2020. Adult workers as learners in the USA higher education landscape. In M. Slowey, H. G. Schuetze, and T. Zubrzycki (Eds.), *Inequality, innovation and reform in higher education: challenges of migration and ageing populations* (pp. 221–235). Cham: Springer.
- Khandkar, S. H. 2009. Open coding. *University of Calgary*, 23(2009).
- Kitto, K., 2022. How can EdTech support graduate employability?. *Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) Publications*, pp.e22184-e22184.
- Knapper, C. 1988. Media and adult learning: A forum: Lifelong learning and distance education. *American Journal of Distance Education*, 2(1), 63–72.
- Lee, M., and Jan, S. K. 2018. Lifelong learning policy discourses of international organisations since 2000: A kaleidoscope or merely fragments?. In M. Milana, S. Webb, J. Holford, R. Waller and P. Jarvis (Eds.), *The Palgrave international handbook on adult and lifelong education and learning* (pp. 375–396). London: Palgrave Macmillan.
- Lock, J., Lakhali, S., Cleveland-Innes, M., Arancibia, P., Dell, D., and De Silva, N. 2021. Creating technology-enabled lifelong learning: A heutagogical approach. *British Journal of Educational Technology*, 52(4), pp. 1646–1662.
- Longhini, J., Rossetini, G., and Palese, A. 2021. Massive open online courses for nurses' and healthcare professionals' continuous education: A scoping review. *International Nursing Review*, 68(1), 108–121.
- Maaranen, K., Kynäslähti, H., Byman, R., Sintonen, S., and Jyrhämä, R. 2020. 'Do you mean besides researching and studying?' Finnish teacher educators' views on their professional development. *Professional Development in Education*, 46(1), pp. 35–48.
- Matheos, K., and Cleveland-Innes, M. 2018. Blended learning: Enabling higher education reform. *Revista Eletrônica de Educação*, 12(1), pp. 238–244.
- Mclsaac, M. S., and Gunawardena, C. N. 1996. Distance education. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology*. (pp. 403–437). MacMillan.
- Mirata, V., Hirt, F., Bergamin, P., & van der Westhuizen, C. 2020. Challenges and contexts in establishing adaptive learning in higher education: findings from a Delphi study. *International Journal of Educational Technology in Higher Education*, 17, 1-25.
- Mozelius, P. 2020. Post corona adapted blended learning in higher education. In D. Remeny, K. A. Grant and S. Singh (Eds.), *Responding to Covid-19: The university of the future*. Reading, UK: ACIL.
- Nuankaew, W. and Nuankaew, P., 2021. Educational engineering for models of academic success in Thai Universities during the COVID-19 pandemic: Learning strategies for lifelong learning. *International Journal of Engineering Pedagogy*, 11(4), pp. 96–114.
- Organisation for Economic Co-operation and Development. (2021). *OECD skills outlook 2021: Learning for life*. OECD. <https://doi.org/10.1787/0ae365b4-en>
- Patton, M. Q. 2002. *Qualitative research and evaluation methods* (3<sup>rd</sup> ed.). Thousand Oaks, CA: Sage.
- Peiris, R., Mozelius, P., Männikkö-Barbutiu, S., and Westin, T. 2015. Bridging the digital divide in Sri Lankan tea estate areas. Sophia Antipolis, France: *Proceedings of IFIP* (Vol. 9, pp. 773–784).

- Peters, M., and Romero, M. 2019. Lifelong learning ecologies in online higher education: Students' engagement in the continuum between formal and informal learning. *British Journal of Educational Technology*, 50(4), pp. 1729–1743.
- Plato. (n.a.). *The republic*. The Internet Classics Archive Retrieved 2019, January 3 <http://classics.mit.edu/Plato/republic.html>
- Pittman, V. V. 2003. Correspondence study in the American university: A second historiographic perspective. In M. G. Moore (Ed.), *Handbook of distance education* (pp. 21–35). Erlbaum.
- Rai, N., and Thapa, B. 2015. A study on purposive sampling method in research. *Kathmandu: Kathmandu School of Law*, 1–12.
- Rashid, S. and Yadav, S.S., 2020. Impact of Covid-19 pandemic on higher education and research. *Indian Journal of Human Development*, 14(2), pp. 340–343.
- Rawas, S., 2023. ChatGPT: Empowering lifelong learning in the digital age of higher education. *Education and Information Technologies*, pp. 1–14.
- Roche, S. 2015. The chain of lifelong learning: linking private and public; singular and societal. *International Review of Education*, 61(2), pp. 127–131.
- Russell, J. M., Baik, C., Ryan, A. T., and Molloy, E. 2022. Fostering self-regulated learning in higher education: Making self-regulation visible. *Active Learning in Higher Education*, 23(2), 97–113.
- Santos, L., Bago, J., Baptista, A. V., Ambrósio, S., Fonseca, H. M., and Quintas, H. 2016. Academic success of mature students in higher education: A Portuguese case study. *European Journal for Research on the Education and Learning of Adults*, 7(1), pp. 57–73.
- Schuetze, H., and Slowey, M. 2020. Higher education in the twenty-first century: New frontiers – old barriers. In M. Slowey, H. G. Schuetze, and T. Zubrzycki (Eds.), *Inequality, innovation and reform in higher education* (pp. 313–323). Cham: Springer.
- Strauss, A., and Corbin, J. 1990. *Basics of qualitative research: Grounded theory procedures and techniques*. London: Sage.
- United Nations Educational, Scientific, and Cultural Organisation (UNESCO). 2021. *Reimagining our futures together: A new social contract for education*. Paris, France: UNESCO.
- Varghese, N. V., and Mandal, S. 2020. Teaching–learning and new technologies in higher education: An introduction. In N.V Varghese, and S. Mandal (Eds.), *Teaching learning and new technologies in higher education* (pp. 1–15). Cham: Springer.
- Vivar-Simon, M., Zabaleta, N., De La Torre, J., Basañez, A., Urruzuno, A., and Markuerkiaga, L. 2022. Towards human-scale competitiveness: Priority challenges for triple helix towards 2030. *Sustainability*, 14(13), 8141.
- Vollstedt, M., and Rezat, S. 2019. An introduction to grounded theory with a special focus on axial coding and the coding paradigm. *Compendium for Early Career Researchers in Mathematics Education*, (13), pp. 81–100.
- Volles, N. 2016. Lifelong learning in the EU: Changing conceptualisations, actors, and policies. *Studies in Higher Education*, 41(2), pp. 343–363.
- Weil, M., and Eugster, B. 2019. Thinking outside the box. De-structuring continuing and higher education. In A. Heikkinen, J. Pätäri, and G. Molzberger (Eds.), *Disciplinary Struggles in Education* (pp. 135–154). Tampere: Tampere University Press.
- Zgaga, P., Teichler, U., Schuetze, H. G., and Wolter, A. 2019. *Higher education reform: Looking back – looking forward*. (Vol. 8). Berlin: Peter Lang.