

Navigating Digitalisation in Adult and Continuing Education

Governance and Policy Perspectives

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Abstract

Adult and continuing education (ACE) are situated within a dynamic system defined by diverse educational institutions, organisations, and political frameworks. The digital transformation poses significant challenges in both strategic planning and practical implementation. There are indications that the process of digitalisation has led to an increased necessity for the coordination among relevant actors, facilitated by a multitude of exchange formats. These stakeholders exert influence through their legal position, political mandate, or role in public discourse. It is reasonable to posit that this will be particularly evident in the field of adult education, given the structural plurality and diversity that characterises this area. Nevertheless, the existing literature on the governance and policy related topics surrounding the digital transformation in adult education remains limited. The contribution aims to provide an international overview of research on policies and governance of the digitalisation of the system of continuing education, based on a international systematic literature review focusing on relevant actors.

Keywords: Digital Transformation, Educational Governance, Adult and Continuing Education Policy, Systematic Literature Review

Zusammenfassung

Die Erwachsenen- und Weiterbildung bildet ein dynamisches System, das durch unterschiedliche Bildungseinrichtungen, Organisationen und politische Rahmenbedingungen geprägt ist. Die digitale Transformation birgt dabei große Herausforderungen, sowohl in Bezug auf die strategische Planung als auch die praktische Umsetzung. Es gibt Hinweise darauf, dass der Prozess der Digitalisierung zu einem erhöhten Abstimmungsbedarf der relevanten Stakeholder führt, der durch eine Vielzahl von Austauschformaten erleichtert wird. Die Digitalisierung des Bildungssektors wird von einer Vielzahl von Stakeholdern geprägt, die durch ihre rechtliche Stellung, ihr politisches Mandat oder ihre Rolle im öffentlichen Diskurs Einfluss nehmen. Im Bereich der Erwachsenenbildung ist aufgrund der strukturellen Pluralität und Vielfalt eine besondere Sichtbarkeit dieser Stakeholder/Einflussnahme zu erwarten. Gleichwohl ist die vorhandene Literatur zu den Governance- und Policy-Themen im Kontext von digitaler Transformation in der Erwachsenenbildung noch begrenzt.

Ziel dieses Beitrags ist es, basierend auf einem systematischen Literaturreview einen internationalen Überblick über die Forschung zu Politik und Governance der Digitalisierung des Weiterbildungssystems mit Fokus auf relevante Akteure zu geben.

Schlüsselwörter: Digitale Transformation, Educational Governance, Erwachsenen- und Weiterbildungspolitik, Systematic Literature Review

1 Introduction

Adult and Continuing Education (ACE) is part of a dynamic system that is shaped by numerous educational institutions, organisations and political framework conditions. The digital transformation poses significant challenges in this regard for both strategic planning and practical implementation (Schrape, 2021; Bonnes, 2023). The extant literature offers only limited insight into the actors and coordination within the institutional environment, at national and supranational levels (Bonnes, 2024; Schrape, 2021). However, it is evident that these actors have a significant influence on the opportunities and limitations of adult learning. The financial framework conditions for the implementation of technical infrastructure and the legal framework conditions for software, for example, are particularly relevant here. Equally important are horizontal and vertical cooperation relationships between continuing education institutions, as well as the role of umbrella organisations and central interface actors in the continuing education landscape.

These aspects have not yet been systematically and comprehensively analysed for ACE. The purpose of this contribution is therefore to seek an exploratory approach via an international systematic literature review (SLR). Its objective is to provide an overview of research on the policy and governance of the digitalisation of the continuing education system. The central research question is: Which governance constellations and policy instruments are addressed in the international research literature on the digital transformation of adult and continuing education, and how do governance and coordination practices vary across national contexts?

In this article, *digital transformation* refers to structural and procedural changes in adult and continuing education (ACE) institutions driven by technological developments, particularly digital infrastructures, platforms, and data-related practices (Schrape, 2021). *Educational policy* is understood as a set of formal strategies, instruments, and regulatory frameworks that guide educational development on national or supranational levels. *Governance*, in line with Altrichter et al. (2007), denotes the coordination of actions and interdependencies between state and non-state actors across multiple levels of the education system.

First, the initial situation and research focus are outlined, with particular attention given to the data economy and platform capitalism in the education sector. The theoretical perspectives are then presented, with educational governance serving as a theoretical point of reference (Altrichter et al., 2007; Kussau & Brüsemeister, 2007; Maag Merki et al., 2014; Schemmann, 2013). This is followed by a description of the SLR methodology. The central results of the analysis are presented in the following section, struc-

tured according to the subjects of digital transformation discussed, (supra-)national education policy instruments and initiatives, and relevant actors. The article concludes with a summary of the key findings and an outlook.

2 Background and Theoretical Perspective

The digital transformation (Schrape, 2021) has led to changes in the education system in various areas of life. These changes do not manifest themselves exclusively in technological developments. Substantial changes in communication and social interaction also permeate organised adult and continuing education (ACE) (Kerres & Buntins, 2020) and have the potential to transform the ACE landscape by expanding or disrupting existing knowledge bases and competences. Furthermore, technological advancements have the capacity to influence extant structures within research and development, production, sales and markets, exerting pressure on established actors to adapt, encourage the emergence of new participants and challenge the entire sectoral configuration. In addition, these phenomena foster novel forms of cooperation and competition, necessitating institutional adjustments, including the establishment of legal and regulatory frameworks, as well as modifications to sectoral guiding principles (Dolata, 2021). Beyond the discourse surrounding the use of digital media in teaching and learning processes, there has been growing attention to the institutionalisation of digitalisation in educational organisations. While this issue has been addressed to some extent in the ACE (Bernhard-Skala, 2019; Bonnes, 2024; Koschorreck & Gundermann, 2021), the perspective of changes in the institutional landscape and administration or policy has received comparatively little attention (Bernhard-Skala et al., 2021).

When considering the institutionalised learning of adults as a multi-level system (Schrader, 2011), factors beyond the specific teaching-learning opportunities must also be taken into account. Schrader's multi-level system distinguishes four levels:

1. the system level, which focuses on the overall social framework and political structures at national and supranational level (e.g. European Union/EU) that influence continuing education (e.g. legal regulations, funding systems and national education strategies),
2. the institutional environment, which is characterised by cooperation, competition, and diverse constellations of actors,
3. the organisational level (e.g. organisational culture, professionalisation) and
4. the teaching-learning interaction level of direct interactions between teachers and learners.

The model provides a framework for comprehending the multifarious constellations of actors and forms of coordination that are instrumental in the context of ACE, by demonstrating the emergence and evolution of social orders and services. However, knowledge about these actors and coordination at the institutional, national and supranational levels in the context of digital transformation is scarce, despite their influence on adult learning.

In this context, the perspective of educational governance offers a valuable lens for understanding and elucidating these processes. It provides a systematic analysis of the processes by which social orders and services are produced in education systems (Kussau & Brüsemeister, 2007). A notable strength of this perspective is its emphasis on the coordination of a multitude of interdependent actors, who collectively influence the performance of continuing education organisations (Kussau & Brüsemeister, 2007). The focus is on the coordination of action (Altrichter et al., 2007), whereby the management of interdependencies of collective and individual actors is considered. The term ‘policy’ is used here to describe phenomena of educational transformation and governance.

While governance research in ACE is still emerging, school research already provides critical studies. In the context of school research, there is already a number of works that critically examine the political dimensions of digital transformation and the growing influence of multinational corporations in the education sector (Dander, 2018; Dander et al., 2024; Förschler, 2018). Recurring themes in these discourses pertain to digital capitalism, data economics and platform capitalism. The term ‘data economy in education’ refers to the collection, analysis and use of data to optimise educational processes and create personalised learning opportunities (Dander et al., 2024). This encompasses the utilisation of learning management systems, digital platforms and AI-powered tools that collect large amounts of data about learners and their interactions. Data capitalism is seen as an economic system in which data is regarded as a commodity and capital, with monetisation through advertising and opacity posing a specific risk to particularly marginalised groups (Friedewald et al., 2024). Platform capitalism, as a distinct production model, describes the dominance of large technology companies that operate educational platforms and pursue economic interests in doing so. These platforms offer learning content, as well as analysis and management tools based on the data collected. Consequently, the control over educational content and processes is being handed over to a small number of large companies (Urban, 2022).

An expansion of the private sector in the field of education is noticeable. However it should not be interpreted as a takeover of state tasks by private actors, according to economisation research in education. Instead, the state actively promotes the penetration of non-economic areas through economic discourses and practices, facilitated by networks, public-private partnerships, and cooperative endeavours within the scope of projects or initiatives (Höhne, 2022). A study on governance in the digital transformation of schools by Förschler (2018) shows that the expansion of networked policy modes can be observed, in which sectoral boundaries are crossed and complex interdependencies between non-state actors and state actors arise. These non-state actors, including EdTech providers, management consultants, and industry associations, have the capacity to influence the establishment of political agendas and the implementation of governance processes across various levels.

The extent to which these developments are evident in ACE remains an open question, given the paucity of comprehensive network analysis studies to date. Given the mid-level systemisation, the political principle of subsidiarity, the complexity of the

multi-level system and the contexts between market and community, it can be assumed that there are at least gradually different developments. Despite the evidence of cooperation and coordination of action in the ACE being network-based and community-based (Bickeböller, 2022; Koller et al., 2021), it can be hypothesised that market-based cooperation is evident, along with a reduced political control over cooperative relationships. Preliminary studies in the field of ACE have indicated the challenging organisational structure principle of platforms and coordination of action amongst the relevant actors involved (Alke, 2022).

Educational governance and policy logics are embedded within broader national institutional configurations. Welfare state theory, particularly as discussed by Esping-Andersen (1998), distinguishes between liberal, conservative and social-democratic models, each associated with distinct patterns of state intervention, market reliance, and the role of civil society.

These regime types influence not only funding structures and regulatory frameworks in adult and continuing education (ACE) (Knauber, 2017), but also shape expectations towards digitalisation, public-private partnerships, and modes of actor coordination. For example, liberal regimes may prioritise employability and digital skills through market-oriented strategies, while conservative systems may display fragmented, corporatist governance. Social-democratic regimes may support universal access through integrated policy instruments.

So far, however, the findings and frameworks presented have been drawn from research in German contexts. The extent to which similar changes and frameworks can also be found in other countries has not yet been systematically compiled. Therefore, a systematic literature review was carried out. The subsequent empirical section will focus on the international systematic literature review, the objective of which is to provide more knowledge about studies, references and connections between digital transformation and governance and policy in ACE, to clarify the desiderata highlighted above.

3 Method

The methodological approach of this article is consistent with the standards set out in the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) by Moher et al. (2015) and the guidelines for conducting systematic reviews by Newman and Gough (2020). The following provides a transparent overview of the search strategy used to develop the data corpus, followed by a description of the coding process and data analysis.

The search for relevant academic publications was conducted between October and November 2024 using the following databases: FIS Education (including ERIC and BASE), Google Scholar and Web of Science. The search was conducted using predefined search terms in German and English reflecting the key research interests. The search terms were categorised into three main groups. The Boolean operator 'OR' was used to link terms within each category, while 'AND' was used to link terms from diffe-

rent categories. The construction of the search strings involved the development of different search queries for English and German terms, which were then customised to the specific requirements of each database. While the search strategy was designed to capture both English and German literature, we acknowledge a bias towards German-language publications. This stems from the current state of research in which many relevant studies, particularly on governance in ACE, are published in German or within the German speaking region. A limited number of search results for an English-only search string were identified, which subsequently resulted in the integration of a German search string. Although efforts were made to include international literature, language barriers have contributed to the underrepresentation of certain regions. We consider this a limitation, yet also a reflection of an empirical gap in the international research landscape.

TOPIC(Erwachsenenbildung OR Weiterbildung OR Fortbildung OR “further education” OR “adult education” OR “continuing education”) AND TOPIC(policy OR governance OR “politische Steuerung”) AND TOPIC(digital*)

The search results can be found in the search results tree (Fig. 1):

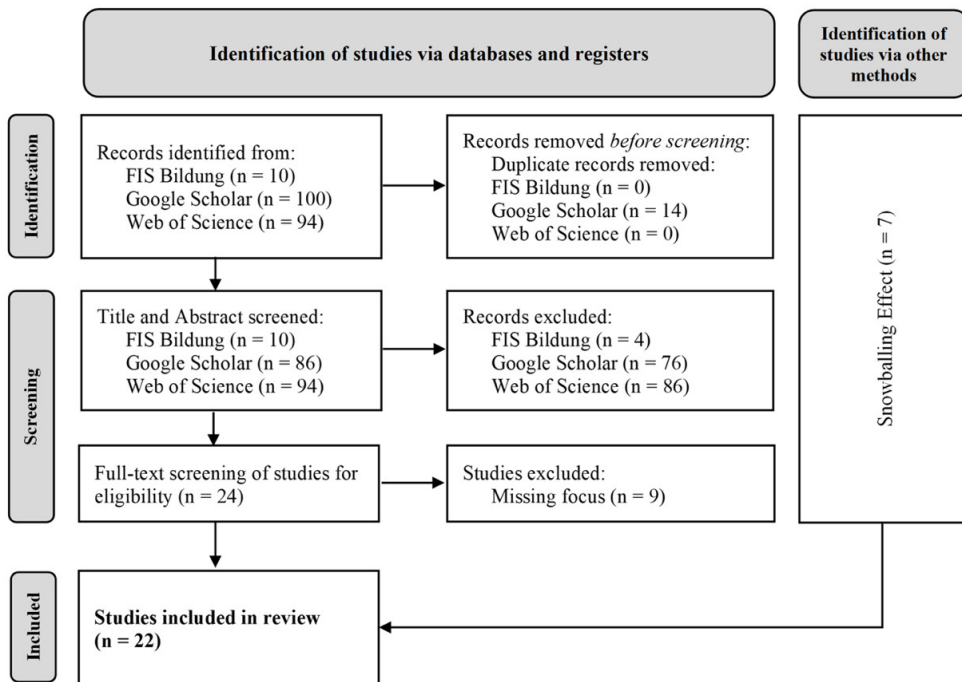


Figure 1: Search results tree

An inductive, systematic coding method was selected for the analysis of the publications included (see, for example, Newman and Gough 2020). Consequently, a thematic coding book was developed, encompassing content codes such as actors, instruments, and objects of digitalisation. While categories emerged inductively from the material, the coding process was theoretically sensitised by key concepts from educational governance research, such as coordination mechanisms and actor constellations. The coding book was subjected to a preliminary evaluation on a sample of works, after which it was refined, expanded and inductively adapted. The final version of the coding book was then utilised to code all included publications with MAXQDA.

Following the coding process, the coded units were analysed for themes, similarities and differences across the papers to synthesise key findings. The results of these analyses are presented below.

4 Results

The corpus is predominantly composed of journal articles (18), with one dissertation and five book chapters. The nations represented are Australia (1), the UK (4), Portugal (2), Germany (13), the USA (1) and Singapore (1). The earliest contribution dates to 2011, and only four contributions were published before 2020. This composition is indicative of the German perspective inherent in our search string, the preponderance of German research in this field, and the dearth of international comparative studies on governance and digitalisation in ACE.

The following section will first provide an overview of the thematic focus and phenomena discussed in the publications in relation to digital transformation. This is complemented by the presentation of respective national and supranational levels, including the connection with relevant education policy and instruments. Finally, an overview of the actors and actor constellations that influence digitalisation-related ACE processes is presented.

4.1 Thematic Focus Areas in the Literature

Digitalisation has an orienting effect on a variety of educational objects or phenomena. Among the recurring themes in the literature is the necessity of digital literacy as a pedagogical programme (Epstein et al., 2011; Eynon, 2021; Helsper & van Deursen, 2015; Lim et al., 2024; Smythe, 2018; Wallis & Buckingham, 2019). Some publications adopt an organisational pedagogical perspective, addressing the conditions of the organisational environment and educational policy (Alke, 2022; Bernhard-Skala, 2019; Bonnes, 2023; Bonnes, 2024a; Koschorreck & Gundermann, 2021; Rohs & Lacher, 2023). There is also a focus on specific technical objects, in particular platforms and e-learning programmes (Alke, 2022; Bonnes, 2023; Lim et al., 2024). The governance and policy aspect is also central to some publications (Alke, 2022; Bonnes, 2024; Castanheira, 2023; Engec, 2022; Lim et al., 2024; Rathmann et al., 2023). Furthermore, special governance-related issues play a role – such as policy advice through the measurement of digital

literacy (Gerhards, 2022; Marshall et al., 2024). These themes recur across countries but are prioritised differently depending on institutional logics and policy orientations, which will be discussed later on.

4.2 (Supra)national Education Policy and Instruments

It is evident that education policy actors are driving the transformation of the legal and regulatory framework around digital transformation.

While the actor constellations vary in composition and influence, a recurring pattern is the increasing importance of cross-sectoral governance involving public and private actors. These constellations mirror the governance logic of the respective welfare regime, with market-led models prevailing in liberal systems and more coordinated public frameworks in conservative or social-democratic settings. Although the reviewed literature does not systematically classify countries by welfare regime types, certain governance patterns observed in the material may tentatively reflect underlying welfare state traditions. This interpretative lens allows for a cautious contextualisation of differences in digital policy and coordination structures.

Germany, for example, is characterised by fragmented governance structures and the principle of subsidiarity, which shape the implementation of digital strategies in ACE Germany, often referred to as operating under a “territorial principle”¹ (Bonnes, 2024; Rathmann et al., 2023; Rohs and Lacher 2023). In contrast, publications from the UK and USA indicate a stronger market orientation and higher involvement of private actors in shaping digital skill agendas (Eynon, 2021; Epstein et al., 2011). Portugal and Singapore show more centralised approaches, with policy initiatives led by state authorities and aimed at digital inclusion or vocational upskilling (Castanheira, 2023; Lim et al., 2024). These findings suggest that while the corpus does not allow for a systematic typological comparison, some country-specific tendencies in governance and policy may align with broader institutional logics.

The instruments and the specific national discussions and mechanisms that can be identified in the review texts are outlined below. While the education policy itself must also be considered as an actor (among others) from the perspective of educational governance, this section is presented before other actors, primarily because of the interest in a coherent presentation of (supra)national education policy.

4.2.1 EU

The European Union has defined digital skills as key competences for lifelong learning. The Digital Education Action Plan (2018–2020) sought to enhance the utilisation of educational technology and advocate for the cultivation of digital competencies. The updated plan (2021–2027) places greater emphasis on developing an effective digital education system and improving digital skills. A European Digital Education Centre has been established to support implementation and promote cooperation (Rathmann

¹ The “territorial principle” refers to the federal governance and funding structure in Germany, where adult and continuing education is primarily regulated and financed at the level of the *Länder* (federal states) or municipalities. This often results in highly decentralised responsibilities and diverse regional practices within the broader national policy framework.

et al., 2023). This Digital Agenda for Europe (DAE) is regarded as the most important framework (Helsper & van Deursen, 2015, p. 137). The authors observe that existing policies have predominantly concentrated on the supply side of the equation, neglecting the demand side. Consequently, there is a necessity to emphasise user-driven and participatory designs, particularly for marginalised individuals within the context of digital literacy. The integration of digital media within educational frameworks is accompanied by three dimensions of expectation, articulated within international and national educational policy documents. At EU level, strategies such as the Digital Education Action Plan 2021–2027 have been developed to build an effective digital education ecosystem.

4.2.2 Australia

In Australia, the government is collaborating with a research group to develop a digital skills assessment tool. The researchers emphasise that policy makers who create benchmarks for digital skills will be more successful if they take into account authentic learning and skills development processes (Marshall et al., 2024). Collaborations with academia and relevant stakeholders in adult education on empirically informed digitalisation policy are therefore recommended: “Overall, we argue that authentic digital skills policy and programme development must account for the contexts in which digital technologies are used” (Marshall et al., 2024, p. 2).

4.2.3 UK

The authors Eynon (2021) as well as Wallis and Buckingham (2019) engage in a critical discussion of some aspects of the UK digitalisation policy in the context of the UK Digital Strategy of the Department for Culture, Media and Sport (DCMS), the Department for Education (DfE), and the Department for Business, Innovation and Skills (BIS). These are responsible for digital skills: Digitalisation policy in England is strongly aligned with the needs of business and has a narrow, instrumental focus on digital skills (Eynon, 2021, p. 149). There is a strong involvement of commercial actors in the design and implementation of digitalisation initiatives, which leads to a prioritisation of commercial objectives (Eynon, 2021, pp. 149, 156). Conversely, a more comprehensive, emancipatory and democratic educational approach to digitalisation is conspicuously absent. Instead, the focus is on teaching operational skills (Eynon, 2021, p. 159). Wallis and Buckingham (2019) draw attention to the fact that no clear definition prevailed in the development of media literacy in the UK, therefore diversity took over and digital literacy became a flexible instrument – also in terms of economic interests.

4.2.4 USA

As Epstein et al. (2011) emphasise that the digital divide is not only a technological problem, but also has significant social and economic dimensions. The authors contend that the digitalisation policy in the education sector of the United States is predominantly oriented towards access to technological resources. In their analysis, they observe a relative paucity of emphasis on cultivations of digital competencies and provi-

sions of support to disadvantaged demographics. This has resulted in an inequitable distribution of benefits, with policies favouring business interests and the advancement of technology, thereby reinforcing existing social inequalities. The authors advocate for a more comprehensive policy that prioritises both access to technology and the cultivation of digital competencies. It is important to note that the text was written in 2011 and does not reflect current American education policy. Nevertheless, it is worth mentioning that clarity of concept is crucial for education policy and the actors involved.

4.2.5 Germany

Germany has a variety of legal regulations in different contexts, but these are not explicitly related to the digital transformation of adult education (Bonnes, 2024). Bernhard-Skala (2019) shows that German education policy needs to adapt to the demands of digital transformation. This necessitates the formulation of novel strategies and the adaptation of extant structures to facilitate the integration of digital media (Bernhard-Skala, 2019). Rathmann et al. (2023) provide an instructive summary of German education policy: In June 2021, the German federal government published the updated Strategy paper Digitalization, which sets out a joint strategic implementation of digital measures with the dual objective of increasing the opportunities of digitalisation for the country's prosperity and assessing the associated risks. The strategy encompasses a range of areas, including digital skills, infrastructure, equipment, and societal aspects of the digital transformation. According to Rathmann et al. (2023) Germany's education policy aims to invest in digital skills, infrastructure and teaching plus learning materials, with the objectives to enable citizens to shape the digital transformation in a self-determined way and to deal with risks responsibly. A range of initiatives designed to foster the development of digital capabilities are to be made available, with the education system itself being recalibrated to place greater emphasis on the digitalised life, the digital workplace and economic sphere, and the digital knowledge society. This focus aligns with the objectives of the EU Digital Education Action Plan, underscoring the EU's strategic influence in this domain (Rathmann et al., 2023).

Rohs and Lacher (2023) draw attention to the principle of spatial structures of ACE through federal education legislation and state regulations. These regulations exert a significant influence on the programming, organisation, financing and quality assurance of continuing education. It is relevant to note that ACE – which is oriented towards the common good – is funded to the approximate extent of 35 % from municipal, district or state sources. However, this principle is being challenged by digital transformation, as programmes are now being offered online and therefore have an impact across regions.

Bonnes' (2024a) analysis demonstrates the pivotal role of political actors in shaping legal and regulatory frameworks concerning data protection. In doing so, these stakeholders establish parameters for the utilisation of specific technologies within educational programmes or formally approve their employment.

4.2.6 Portugal

In April 2020, the Plano de Ação para a Transição Digital was initiated in accordance with the national e.2030 initiative for digital skills. The Capacitar i4.0 programme is instrumental in promoting the development of in-house and inter-company training measures in this area. The Plano de Ação para a Transição Digital is comprised of three principal domains (Rathmann et al., 2023, p. 117): The first area focuses on the digital inclusion of people through adult and continuing education (ACE); the second area targets the digital transformation of companies; and the third area concerns the digitalisation of government services. The first area, which aims at the digital inclusion of people, includes strategies such as digital education and training activities funded through various programmes, including INCoDe.2030. The government's strategy to support the digital transition is intended to create a knowledge-based economy and society in which productivity growth is fuelled by innovation and highly skilled people. The Ministry of Education, the National Agency for Qualification and Professional Education (ANQEP) and the Instituto do Emprego e Formação Profissional (IEFP) are the primary entities responsible for the provision of guidelines and tools related to guidance services (Castanheira, 2023; Rathmann et al., 2023)

4.2.7 Singapore

In Singapore, the government has initiated the SkillsFuture programme. This programme is an initiative to promote lifelong learning and skills development for adults (Lim et al., 2024). In contrast to earlier schemes in which the responsibility for employee training lay with employers, SkillsFuture promotes employee self-improvement, making them more appealing to employers. Additionally, SkillsFuture plays a pivotal role in the transition of the Singaporean economy from a capital-intensive to a knowledge-intensive economy by emphasising key competencies for Industry 4.0. Digitalisation-related skills and e-learning are inextricably interwoven in this context. Singapore's commitment to lifelong learning – with a particular emphasis on digitalisation-related vocational training and in-company training – positions it as a leading proponent of innovative educational models (Lim et al., 2024).

5 Actors and Actor Constellations

A close examination of the extant literature reveals that digitalisation has given rise to a new constellation of actors in the field of adult education. To facilitate digital transformation in this sector, it is imperative to establish a wide network of relevant actors. Alongside conventional educational institutions (adult education centres and providers) technology companies, platform operators and education technology companies (EdTech) have now entered this field (Alke, 2022; Bonnes, 2023; Schmid, 2021). These actors bring new opportunities for collaboration, but also challenges in terms of competition and market position, and also require careful coordination (Alke, 2022; Bonnes, 2023; Echarti et al., 2023). These actors are involved in steering digital agendas

either through formal policymaking, resource provision, or indirect influence (e.g. agenda-setting, lobbying). While associations and umbrella organisations of ACE play a central role, technology providers with a profit-motive pursue their business interests, which are not always in alignment with the goals of continuing education for the common good (Eynon, 2021). Digitalisation necessitates strategic management of ACE organisations to ensure that the opportunities offered by new collaborations are exploited while minimising the risks posed by new competitors (Bernhard-Skala et al., 2021; Bonnes, 2024).

5.1 ACE Organisations

In consideration of the conditions in digital transformation from the vantage point of ACE organisations within the institutional environment, Bonnes (2024) expounds that digital transformation engenders social interactions with a diverse array of actors within the organisational milieu. These include addressees of adult education, ACE associations, external service providers, freelance course instructors, managers of other adult education organisations, and political actors. These actors can act in an advisory and reflective capacity to initiate or drive changes in organisational programmes, structures, and digital media repertoire. A particular focus in managing these transformations should be on the leadership of ACE organisations (Bonnes, 2024, p. 331). Bernhard-Skala (2019) asserts that this necessitates a comprehensive and meticulously devised strategy that encompasses both the technical and pedagogical dimensions of digital transformation. A significant challenge pertains to the investment in the requisite IT infrastructure and the necessity for qualified personnel, who must be appropriately remunerated – a factor that presents difficulties for numerous institutions (Bernhard-Skala, 2019). Digitalisation alters both internal workflows and external cooperation patterns, often requiring new governance capacities.

In the context of the increasing expansion of platforms, Alke (2022) notes that both the organisational fields in continuing education and the organisational form itself will change in the medium and long term.

As demonstrated by Rohs and Lacher (2023), digitalisation has had a significant impact on territorial principles. Digital learning platforms and online courses enable ACE providers to disseminate their programmes over greater geographical distances, overcoming traditional spatial boundaries. Empirical evidence indicates that the territorial principle currently serves as a guiding principle. However, current developments – such as platforms – are dynamic. This necessitates ongoing adjustments to the prevailing framework conditions, including financial support and reliance on local authorities. Eynon (2021) proposes: “formal educational initiatives that encourage community-focused approaches to learning about technology is one way this more democratic form of education, that goes beyond skills training, could be achieved” (p. 158).

5.2 Umbrella Organisations

Umbrella organisations and trade unions play a pivotal role in shaping the content and form of digital ACE, and implementation of digital platforms in ACE centres. It is evi-

dent that this facilitates benefits, especially for small, resource-constrained institutions. The vhs.cloud serves as the primary reference point for current developments and discussions within the community of ACE centres, having been introduced in 2018 as a ‘digital home port’ (Alke, 2022, p. 25). In Singapore, the Continuing Education Authority (SSG) and the Institute of Adult Learning (IAL) as an umbrella organisation launched the initiative iN.LEARN 2.0 in 2022 to promote blended learning and the use of online tools in continuing vocational education and training (Lim et al., 2024a, p. 9).

In Germany, guiding principles for digital transformation have been established at the level of umbrella associations: In a position paper, various objectives in relation to the digital transformation are articulated. These include the expansion of networking between adult education institutions and other stakeholders, the development of new social communication and learning spaces, the orientation towards relevant European competence models, the improvement of the organisational digital media repertoire and the development of new sources of funding (Bonnes, 2024, p. 329). The umbrella organisations support the transformation of organisational structures in the area of marketing through guidelines for digital corporate design and offer individual institutions digital platforms for course designs and inter- plus intra-organisational exchange (Bonnes, 2024, p. 331).

Their role reflects both centralised coordination and decentralised service provision, varying by context.

5.3 Private Actors

The publications indicate that the constellation of actors and control dynamics have expanded and evolved in consequence of digital platforms assuming greater importance (Alke, 2022; Bonnes, 2023). New actors – such as platform operators, educational technology companies or agencies – now either support or replace training providers. In Singapore, this shift is visible in the SkillsFuture initiative, which links education closely to employment. The state has also embarked on collaborative endeavours with commercial entities: Companies and start-ups in the ‘EdTech sector’ in particular are developing education platforms (Schmid, 2021) as products of an international organisational field in which these players coordinate in a market-like manner (Alke, 2022). The result is that they can expand the scope of action of ACE organisations, for example by delocalising ACE marketing (Bonnes, 2023, p. 51).

Digital platforms are typically characterised by profit-driven enterprises. These companies are setting the rules and thus shape users’ activities. This power imbalance has drawn criticism, especially in connection with critical emancipatory educational work on digital literacy (Eynon, 2021). There is a “need to reconsider the role of the commercial sector in the development, implementation and evaluation of digital skills policies” (Eynon, 2021, p. 13). It is evident that the “framing” in which subjects of digitalisation are articulated exerts a significant influence on the extent to which political decisions favour the commercial sector or the financing of measures oriented towards the public good (Epstein et al., 2011).

According to German ACE provider statistics, 22% of providers perceive online continuing education providers as strong competition (Echarti et al., 2023, p. 35). Globally, the potential of edtech start-ups is emphasised, and the fact that European education technology companies are in the minority is problematised (Schmid, 2021).

EdTech firms, platform operators and consultants are increasingly relevant. Their logic is primarily commercial, sometimes conflicting with public education goals (Eynon, 2021; Schmid, 2021). They act as informal governors through technological standards, licensing models, and interoperability control.

5.4 Employers

The policy of digital transformation in Singapore is closely linked to employers and is primarily realised as workplace education (Lim et al., 2024). In this regard, collaboration with governments, educational institutions, private institutions and employers is crucial for the development of effective upskilling and reskilling programmes (Lim et al., 2024b).

5.5 Participants

Participants must be considered as central actors in a digital ACE landscape. As paying actors, they are crucial in the development of programmes (Lim et al., 2024a) and they exert an influence on the continued existence of ACE institutions and digital platforms through assessment and evaluation systems (Alke, 2022). In this context, instruments and programmes to promote digital skills should aim to establish a democratic relationship between individuals, educational institutions and the state, in which all stakeholders jointly determine what is valued by society (Eynon, 2021, p. 156). Learners influence ACE systems by shaping demand and platform usage. Some policies aim at their empowerment (Lim et al., 2024), while others risk excluding disadvantaged groups (Epstein et al., 2011).

These findings suggest that governance in ACE is becoming more polycentric, involving public, private and civic actors in shifting constellations. The coordination of these actors reflects broader regime logics and levels of public sector control.

6 Conclusion

The international SLR revealed various aspects that are relevant for answering our research question: First, the digital transformation in ACE necessitates a comprehensive network of stakeholders and is giving rise to new market actors, which in turn enable and/or require new forms of cooperation. Nevertheless, such cooperation should be critically examined, as the potential partners may also be regarded as competitors, thereby influencing the structure and the orientation of educational programmes.

Second, the findings indicate that the digital transformation is endorsed by a range of education policy instruments and programmes at national and supranational

levels. These aim to foster digital skills, to enhance technical infrastructures and to adapt legal frameworks.

Regarding the discussion on data capitalism and the platform economy, the results reveal that digital platforms act as central structural principles of digitalisation. While offering opportunities, they also have the capacity to precipitate market transformations and an orientation towards economic interests. This underscores the need for a critical examination of the role of commercial entities in this context. Furthermore, the findings support an educational governance perspective, which emphasises the coordination and interdependencies between different actors in the education system. Thus the digital transformation requires cooperation and new networks between diverse actors to develop and implement effective governance mechanisms. The findings indicate that digital transformation in ACE is driven by a wide range of actors and that governance configurations differ significantly across countries. These differences become more interpretable when situated within the broader context of welfare state regimes. Some of these differences may tentatively reflect broader institutional logics such as decentralisation, market orientation, or state-led coordination.

In the German cases, the subsidiarity principle and federal structure appear to complicate coordinated digital strategies. In contrast, studies from countries like the UK or USA suggest a stronger reliance on market actors and economic imperatives, whereas Portugal and Singapore seem to implement more centralised, government-led approaches. These observations should be understood as illustrative rather than representative, as the corpus is limited in scope and regional balance. The role of public and private actors, the framing of digital literacy, and the structure of policy instruments appear to mirror existing educational and political infrastructures.

Although this international review provides an initial exploratory approach, a more profound understanding of the intricate interconnections, the scope of influence, and the modes of cooperation among these diverse actors requires an in-depth and nuanced analysis of networks (Kussau & Brüsemeister, 2007). Future research should examine more systematically whether and how welfare state regimes, governance traditions, and policy paradigms influence digital strategies in ACE. This would require broader empirical sampling and comparative analytical designs.

The international SLR highlights the growing complexity of actor constellations and governance mechanisms in the context of digitalisation in ACE. It also reveals significant gaps in the current state of research. Most notably, the reviewed studies are predominantly grounded in the German context, with limited representation of other regions. This reflects both a methodological limitation and a broader research gap. In this context, it is important to bear in mind that despite the structured and comprehensive synthesis of existing research, certain limitations of the SLR must be considered, since they are susceptible to publication bias. The heterogeneity of the included studies and the variability in the quality of these studies often limit the comparability and reliability of the results. The development of a search string for this unexplored field was also a challenge, which we met by multidimensional development of search terms and a snowball search. The scarcity of international studies underlines the need for more

research. Future research should pursue more comprehensive international comparisons that explicitly incorporate welfare regime typologies and governance models. Empirical studies based on network analysis, actor mapping or policy tracing could deepen our understanding of coordination mechanisms in digital ACE. Thus, future research should further investigate how welfare state logics interact with technological change in ACE, particularly through cross-country comparative designs.

Despite limitations due to language scope and database coverage, this review provides a first step toward a more structured understanding of governance in the digital transformation of adult education. The insights gained may inform future empirical work and policy development in this crucial area of educational research.

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