Preparing Organizations for the Digital and AI-Driven Economy: Building Dynamic Capabilities Through Continuing Education

Siw M. Fosstenløkken, Oslo Metropolitan University, Norway
Annita Fjuk, Digital Norway, Norway

The Asian Conference on Education 2024
Official Conference Proceedings

Abstract
This article examines the role of continuing education in fostering the development of dynamic capabilities essential for navigating the demands of a digital and AI-driven economy. Through a qualitative analysis of reflections from participants enrolled in university-level programs on digital transformation and artificial intelligence (AI) in Norway, the research identifies three core dynamic capabilities cultivated through these programs: (i) the ability to sense and recognize digital opportunities, (ii) the capacity to seize these opportunities by applying theoretical insights and practical tools to organizational challenges, and (iii) the competence to transform and reconfigure organizational strategies to drive digital transformation. The findings highlight the value of integrating theoretical frameworks with practical applications to enhance professional practice and organizational adaptability. This study contributes to the literature on lifelong learning and dynamic capabilities by demonstrating how continuous education can enable individuals and organizations to remain competitive in dynamic and technologically complex business environments.

Keywords: Digital Transformation, AI, Dynamic Capabilities, Continuing Education, Lifelong Learning

Introduction

University courses of continuing education typically bring together scholarly knowledge from theory and practitioners with hands-on experience in organizations (Fjuk & Fosstenløkken, 2021). With the high pace of digital technological development and particularly the growth of AI (artificial intelligence), knowledge and new practice are required, perhaps to a faster and greater extent than ever before. From practice, we see that worldwide, leading companies are at the inception of a paradigm shift pushed by rapid technological advancements, particularly in generative AI and large language models (Daugherty et al., 2023; Singla et al., 2024). Organizations increasingly integrate generative AI across multiple business functions, reporting both cost reductions and revenue growth (Singla et al., 2024). As AI and digital technologies continue to transform industries, continuing education is essential for individuals and organizations to remain competitive and resilient in the new AI- and technology-driven economy (Cetindamar et al., 2022; OECD, 2024; Singla et al., 2024). This swift pace of development engenders new and critical competency requirements across value chains and sectors to ensure competitiveness and value creation.

In Norway, the utilization of AI and digital technologies could augment the country's value creation by 5,600 billion NOK by 2040, with generative AI alone contributing an increase of 2,000 billion NOK (Jordel, 2023; Oslo Economics, 2022). McKinsey & Company (2023) estimates that one in two Norwegians have job tasks that could be more than 50 % automated through generative AI, with the most significant impact anticipated among highly educated knowledge workers. Nevertheless, only 24 % of Norwegian enterprises currently employ AI, with a lack of competence cited as the primary barrier (Jordel, 2023). Consequently, Norwegian companies are presently ill-prepared for this emerging paradigm—driven not only by rapid technological progress but also by the unpredictable and constant nature of these changes (Fagerland et al., 2024). Furthermore, in response to the accelerated pace of change that arises from the emergence of AI and the inherent unpredictability of continuous technological innovations, these drive the importance of developing *dynamic capabilities* (Fagerland & Fjuk, 2025). Dynamic capabilities are essential not only for leveraging sustainable business value in changing business environments (Teece et al., 1997; Teece, 2007; Teece, 2014), but also for proactively shaping the future through innovation and strategic agility (Breznik & Hisrich, 2014; Helfat et al., 2007; Song et al., 2005).

Universities, therefore, play a pivotal role in equipping the workforce with the competence and skills needed to navigate and thrive in such dynamic environments (Fagerland et al., 2024; Fjuk & Fosstenløkken 2021). Furthermore, the incorporation of AI in education highlights its transformative potential to enhance teaching and learning processes. AI technologies demonstrate the capacity to personalize educational experiences, streamline learning pathways, and foster improved engagement and performance (Gligorea et al., 2023; Wang et. al., 2024). Adaptive learning systems, underpinned by AI and machine learning algorithms, have shown significant potential in customizing educational experiences to meet individual needs, thereby enhancing learning outcomes (Gligorea et al., 2023; Nurjanah et al., 2024). Generative AI tools, including virtual tutors and digital assistants, are revolutionizing education by providing tailored learning trajectories and fostering interactive engagement (Holmes et al., 2022). This article, thus, explores how continuing educational programs in digital transformation with AI contribute to developing critical dynamic capabilities among the participants. We outline the following research question: *How do continuing education programs in digital transformation with AI contribute to the development of dynamic capabilities?*

Dynamic Capabilities as Theoretical Framework

The concept of dynamic capabilities was introduced by Teece and colleagues (1997) and emphasize an organization's strategic adaptability to thrive in unpredictable and rapidly changing environments through the continuous reconfiguration of resources and competencies (Eisenhardt & Martin, 2000; Helfat et al., 2007; Teece et al., 1997). These capabilities reflect an organization's capacity to identify opportunities and threats, seize opportunities through deliberate strategic actions, and reshape its resource base to sustain competitive advantage and ensure long-term evolutionary fitness (Kræmmergaard, 2024; Teece, 2007). The concept of dynamic capabilities is particularly relevant in the context of digital transformation and AI, where technological advancements and market conditions are in constant flux (Fagerland & Fjuk, 2025). The increased accessibility of advanced digital technologies and AI have introduced significant new dimensions to the concept of dynamic capabilities, enhancing organizational adaptability in an increasingly complex digital economy (Ellström et al., 2022; Gómez & De Pablos-Heredero, 2020). The interplay between AI and dynamic capabilities underscores the strategic imperative for organizations to invest in AI not merely as an operational tool but as a transformative enabler of the competencies required to succeed in complex and unpredictable markets (Ellström et al., 2022). By fostering strategic adjustments, dynamic capabilities enable organizations to navigate digital transformation processes, thereby enhancing their responsiveness and adaptability to external changes.

AI, as a transformative technology, enhances all components of dynamic capabilities by promoting value creation, operational efficiency, and strategic adaptability (Gómez & De Pablos-Heredero, 2020). Specifically, AI amplifies organizations' sensing capabilities by leveraging advanced data analytics, machine learning, and predictive modeling, which enable firms to identify subtle shifts in market trends, customer behaviors, and emerging opportunities with unprecedented speed and accuracy. This enhanced capacity for environmental sensing allows organizations to be more proactive and strategically aligned, particularly in industries where AI-driven solutions facilitate personalized services and optimized customer relationship management, thereby strengthening competitive positioning (Gómez & De Pablos-Heredero, 2020).

AI is increasingly acknowledged as a critical enabler of dynamic capabilities, supporting the continuous adaptation and transformation required to succeed in today's digital economy (Ellström et al., 2022). Dynamic capability, however, should also be conceptualized as a form of dynamic imagination, wherein organizations must not only adapt to changing circumstances but also creatively envision and implement innovative technological solutions to maintain competitiveness. This interpretation extends beyond traditional views of dynamic capabilities as purely adaptive mechanisms, highlighting the imaginative and anticipatory dimensions that are essential for fostering innovation and achieving sustainable competitive advantage (Fagerland & Fjuk, 2025).

Three key components of dynamic capabilities can be derived from this literature: First, *sensing opportunities and threats.* This involves identifying and assessing opportunities and threats in the business environment. It requires a firm to be vigilant and proactive in scanning the market, technological trends, and competitive landscape. In the context of digital transformation, this might include recognizing the potential of emerging technologies like AI, blockchain, or the Internet of Things (IoT). Second, *seizing opportunities.* Once opportunities are identified, firms must act on them by mobilizing resources and capabilities. This includes

making strategic decisions, investing in new technologies, and developing new products or services. For instance, a company might invest in AI-driven analytics to enhance its decision-making processes or customer service operations. Third, *transforming and reconfiguring.* This component involves the continuous renewal and reconfiguration of the firm's resources and capabilities to maintain competitiveness. It requires flexibility and adaptability, enabling the firm to pivot in response to changes in the environment. In the realm of digital transformation, this could mean restructuring the organization to better integrate digital technologies or retraining employees to develop new skill sets.

Dynamic capabilities are not only applicable to organizations but also to individuals (e.g. Buil-Fabregà, 2017), which is of particular relevance in this context of continuing education and lifelong learning. As the pace of technological change accelerates, individuals must continuously update their skills and knowledge to remain relevant in the workforce. Lifelong learning enables individuals to develop dynamic capabilities by: *Sensing*: Staying informed about the latest trends and developments in their field. *Seizing*: Taking advantage of learning opportunities, such as enrolling in university courses or professional development programs. *Transforming*: Applying new knowledge and skills to adapt to changing job requirements and career paths.

Therefore, university courses can play a crucial role in developing the dynamic capabilities of lifelong learners by equipping them with the competence (skills and knowledge) needed to succeed in the era of digital transformation and AI.

Methods

This study employs a qualitative research design (Patton, 2015) to explore the contributions of university courses to the development of dynamic capabilities in digital transformation and AI. The course content focused on Digital transformation and leadership as well as Strategic leadership of digital processes and AI. More specifically, we conducted a qualitative document analysis to interpret and understand data derived from written documents (Østbye et al., 2023). Data were collected directly from the primary source, consisting of 140 students.

The unit of analysis was the students' perceptions of their own learning, interpreted from written materials. The data comprised written submissions such as assignments, reflection notes, evaluations, and exams. A central element in these texts was each student's own project of Digital Change, chosen from real work practice in the respective organization. The Digital Change project consisted of the planning, strategic choices, analyses and implementation of digital processes, of which typically AI was involved, particularly in the latter course. In the document analyses, it was crucial to highlight both the unique perspectives of each student and the commonalities across students. The material was coded based on thematic analyses of micro-processes focusing on dynamic capabilities: *Sense*: New insights through theory and practice. *Seize*: Digital competence and project execution. *Transform*: Development and implementation of action plans.

The students were enrolled in five courses on digital transformation at OsloMet between 2020 and 2024. Each course awarded 10 ECTS credits, with one course specifically focusing on artificial intelligence. The students had an even gender distribution and was mainly aged 30–50 years. The courses were fully online, which also included digital seminars with the teacher. The courses were part of a continuing education program for leaders and employees

in both private companies and public sector organizations. Throughout the courses, students systematically and process-orientedly engaged with theory and practical tools. To ensure practical relevance, tools were applied to real problems from the students' workplaces, such as tools for innovation processes and tools for digital transformation and leadership.

The use of the students as primary sources ensure high validity as the informants are the closest source to their own learning perceptions. The fact that the documents were made concurrently with or immediately after ongoing learning further strengthens the validity of the data. The written documents served various purposes but were all produced to enhance the students' learning outcomes and foster more reflection on the educational value in their professional practice. Variations in learning perceptions were observed, but there was little difference across the courses, as shown in the next section.

The Role of Continuous Education in Building Dynamic Capabilities for Sustained Competitiveness in the Digital Economy

The study examines the enhancement of dynamic capabilities among adult learners, structured around three principal themes: *Sensing new understanding and recognition of concepts*. The programs strengthened the participants' capabilities in digital transformation through three key aspects:

1. Gaining New Conceptual Understanding and Theorization

The participants reported that the program provided them with a deeper understanding of theories and concepts, as illustrated by one reflection: *"Everyone knows businesses need digitalization, but it has been incredibly valuable to learn the theories underpinning these processes."* They also emphasized the importance of interaction, flexibility, and diverse pedagogical resources as catalysts for learning: *"The course has significantly broadened my knowledge base. I have not only learned and practiced theories but also gained insights from knowledge-based companies about relevant topics."*

2. Gaining New Insights Into Drivers, Trends, and a Holistic Perspective on Digital Transformation

The participants realized that digital transformation encompasses more than technology, particularly focusing on customer-centricity: *"What strikes me is that customer focus and engaged change leadership are more important than ever."* They also highlighted the interplay between technology and business development: *"The course has given me a deeper understanding of digital transformation as a whole, beyond just the technical aspects."*

3. Practical Understanding Through the Use of Tools in Real-World Challenges

The combination of theoretical and practical approaches in the course was deemed valuable: *"It has been an engaging approach that expanded my insights into innovation processes and the opportunities presented by digitalization."* Students also noted increased motivation and flexibility through online learning: *"The program is impressive in its breadth, challenging students to learn at their own level and pace."*

The program enhanced participants' understanding of digital transformation by deepening their grasp of underlying theories and concepts. Participants appreciated the interactive and

flexible pedagogical approach, which broadened their knowledge base. They also gained a holistic perspective on digital transformation, recognizing the critical role of customer-centricity and the interplay between technology and business development. The integration of theoretical and practical approaches provided valuable tools for real-world challenges, with the online learning format offering motivation and flexibility.

Addressing and Acting on Digital Opportunities

The program equipped the participants with tools and insights to apply theories to real-world challenges, particularly in two ways: (i) *addressing customers and stakeholders:* The participants found the tools useful for organizational development and digitalization efforts: *"The course has provided me with new models to work with colleagues and customers, and I feel more confident in handling various demands and situations."*. And secondly through (ii) *analyzing organizational potential and competitiveness:* Through practical tools and theoretical insights, the participants developed the ability to identify opportunities for innovation: *"I have become more conscious of how I can apply theories on innovation and digitalization in my work environment."* This has improved practices and enhanced their ability to leverage digital opportunities within their organizations.

The program effectively enhanced participants' abilities to apply theoretical concepts to practical organizational challenges. Participants reported increased confidence in engaging with colleagues and customers, stating that the program provided them with new models for collaboration and digitalization efforts. Additionally, they developed a heightened awareness of how to apply theories of innovation and digitalization within their work environments, leading to improved practices and an enhanced capacity to leverage digital opportunities within their organizations.

Developing and Planning for Digital Transformation

The participants reported valuable learning experiences related to the future application of knowledge and skills, particularly through the development of action plans for change projects: *Building structure for innovation and decision-making:* The courses encouraged holistic thinking and boldness in innovation: *"I have learned the importance of gathering information and using resources effectively to create value.". Refining customer focus in transformation work:* Several participants highlighted increased customer orientation as central: *"I now see the necessity of planning for better customer experiences in my digital systems." Career development and labor market impact:* For some, the course led to significant career advancements: *"I was motivated to apply for, and secured, a new role focused on digitalization processes."*

This way, the program fostered holistic thinking and encouraged boldness in innovation, enabling participants to effectively gather information and utilize resources to create value. It emphasized the importance of customer-centric planning in digital systems, leading to improved customer experiences. Additionally, the course facilitated significant career advancements for some participants, motivating them to secure roles focused on digitalization processes.

Conclusions and Implications

The purpose of this study was to explore how continuing education fosters the development of dynamic capabilities for transformation within organizations and professional practice. The findings highlight three essential capabilities for successful digital transformation:

1. *Sensing and recognizing opportunities*: Identifying new digital business opportunities and gaining fresh insights.
2. *Analyzing and addressing digital challenges*: Applying advanced skills to evaluate and act on digital opportunities.
3. *Driving and planning change and transformation:* Leading change, plan and developing actionable strategies for digital transformation.

The program effectively combined theory and practice, equipping participants with practical skills to navigate transformation efforts. The courses have proven valuable for participants, enhancing their ability to contribute meaningfully to their organizations. We can thus conclude that the continuing education program has developed key dynamic capabilities, providing practical value in transformation efforts for the participants and their organizations.

As the need for rapid workplace transformation grows, so does the demand for continuous skill development. Future research should explore the interplay between dynamic capabilities and transformation processes across industries and how individuals and organizations can be motivated to invest in lifelong learning to remain competitive in a fast-evolving landscape.

References

Breznik, L., & Hisrich, R. D. (2014). Dynamic capabilities vs. innovation capability: Are they related? *Journal of Small Business and Enterprise Development, 21*(3), 368–384.

Buil-Fabregà, M., Alonso-Almeida, M., Bagur-Femenías, L. (2017). Individual dynamic managerial capabilities: Influence over environmental and social commitment under a gender perspective. *Journal of Cleaner Production*, *151*, 371-379.

Cetindamar, D., Katic, M., Burdon, S., Gunsel, A. (2021). The Interplay among Organisational Learning Culture, Agility, Growth, and Big Data Capabilities. *Sustainability 13*(23), https://doi.org/10.3390/su132313024

Daugherty, P., Ghosh, B., Narain, K., Guan, L. & Wilson. J. (2023). *A new era of generative AI for everyone. The technology underpinning ChatGPT will transform work and reinvent business.* Accenture.

Eisenhardt, K., & Martin, J. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, 21*, 1105–1121.

Ellström, D., Holtström, J., Berg, E. & Josefsson, C. (2022). Dynamic capabilities for digital transformation. *Journal of Strategy and Management*, *15*(2), 272-286. https://doi.org/10.1108/JSMA-04-2021-0089

Fagerland, B. & Fjuk, A. (2025). Dynamic Leadership Model: Enhancing Dynamic Capabilities for Navigating Constant Change. Submitted to *Learning Management*, January 2025.

Fagerland, B., Fjuk, A., & Boe, O. (2024). Næringslivets kompetansebehov i et nytt paradigme: Er handelshøyskolene rustet for høy endringstakt i næringslivet? *Magma, 21*(4), 67-90.

Fjuk, A. & Fosstenløkken, S. M. (2021). Videreutdanning for SMB: Utvikling av dynamiskekapabiliteter i digital transformasjon. Further education for SMB: The development of dynamic capabilities in digital transformation. *Magma*, 6.

Gligorea, I., Cioca, M., Oancea, R., Gorski, A. T., Gorski, H., & Tudorache, P. (2023). Adaptive learning using artificial intelligence in e-learning: a literature review. *Education Sciences*, *13*(12), 1216.

Gómez, C. G., & De Pablos-Heredero, C. (2020). Artificial Intelligence as an Enabling Tool for the Development of Dynamic Capabilities in the Banking Industry. *International Journal of Enterprise Information Systems, 16*(3). 20-33.

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. J., & Winter, S. G. (2007). *Dynamic capabilities: Understanding strategic change in organizations*. Blackwell Publishing.

Holmes, W., Porayska-Pomsta, K., Holstein, K., Sutherland, E., Baker, T., Shum, S. B., Santos, O. C., Rodrigo, M. T., Cukurova, M., Bittencourt, I. I. & Koedinger, K. R. (2022). Ethics of AI in education: Towards a community-wide framework. *International Journal of Artificial Intelligence in Education, 32*(3), 504–526. https://doi.org/10.1007/s40593-021-00239-1

Jordel, H. (2023). *Kunstig intelligens i Norge: Nytte, muligheter og barrierer* (rapport 35-2023). Samfunnsøkonomisk analyse AS.

Kræmmergaard, P. (2024). *Mind the gap. Digital modning – ditt ledelsesansvar*. Oslo: Cappelen Damm. (Originally in Danish). https://cappelendamm.no/_mind-the-gap-pernille-krammergaard-9788202848736

McKinsey & Company. (2023). *Det økonomiske potensialet til Generative AI: Det neste framskrittet innen produktivitet*. McKinsey & Company.

Nurjanah, A., Salsabila, I. N., Azzahra, A., Rahayu, R., & Marlina, N. (2024). Artificial intelligence (ai) usage in today's teaching and learning process: A review. *Syntax Idea*, *6*(3), 1517-1523.

Oslo Economics. (2022). *Kompetanse- og kunnskapsbehov for det grønne skiftet: Utredning på oppdrag for NHO og LO* (OE-rapport 2022-72). Oslo Economics.

Østbye, H., Helland, K., Knapskog, K.,Larsen, L.O & Moe, H. (2023). *Metodebok for mediefag*. Method Book for Media Science. 5th ed. Bergen: Fagbokforlaget.

Patton, M. Q. (2015). *Qualitative Research & Evaluation Methods*. 4th ed. Thousand Oaks, CA: Sage.

Singla, A., Sukharevsky, A., Yee, L., Chui, M., Hall, B. (2024). The state of AI in early 2024: Gen AI adoption spikes and starts to generate value. QuantumBlack, AI by McKinsey and McKinsey Digital.

Song, M., Droge, C., Hanvanich, S. & Calantone, R. (2005). Marketing and technology resource complementarity: An analysis of their interaction effect in two environmental contexts. *Strategic Management Journal, 26*(3), 259–276.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and micro-foundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350.

Teece, D. J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *The Academy of Management Perspectives*, *28*(4), 328– 352.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509-533.

Wang, S., Wang, F., Zhu, Z., Wang, J., Tran, T. & Du, Z. (2024). Artificial intelligence in education: A systematic literature review. *Expert Systems with Applications,* 252, Part A.