DOI: https://doi.org/10.62985/j.huit_ojs.vol26.no3E.599

RETHINKING HUMAN CAPITAL IN THE DIGITAL ERA

Le Dinh Thi Le*, Thai Huy Binh

Ho Chi Minh City University of Industry and Trade

*Email: *leldt@huit.edu.vn*

Received: 6 April 2026; Revised: 30 April 2026; Accepted: 16 May 2026

ABSTRACT

Digital transformation is now a key characteristic of today's economies, altering both the way organisations function and the way work is carried out. Since technologies like artificial intelligence, automation, and data-driven systems are having an ever-greater impact on labour markets, human capital has once again come to the forefront of economic analysis. The traditional theory of human capital views skills as assets that are acquired via formal education and training and is expected to yield fairly steady returns over time. Although this approach was appropriate for the industrial age, it is less capable of dealing with the dynamics of digitally mediated environments involving rapid technological change and shifting requirements for skills, in which knowledge loses value more quickly and career paths become less predictable. In reply to this, the paper presents a conceptual argument based on three closely linked changes in the way human capital is understood: a shift from static skills to adaptive capabilities, from a single investment in education to ongoing development, and from individual expertise to relational and digitally embedded forms of capability, such as collaboration between humans and machines. The paper also points out the implications of these changes for social inclusion, especially in situations where access to digital infrastructure and learning opportunities is still unequal.

Keywords: Human capital, digital transformation, adaptive capability, continuous development, social inclusion.

1. INTRODUCTION

In recent years digital transformation has been a key characteristic of the global economy. The quick advancement of technologies including artificial intelligence, automation, and data-driven systems is altering the way in which organisations operate and the way in which value is generated. These changes do not only affect business models; they are also transforming the character of work, the structure of employment, and the kinds of skills needed in the labour market. Consequence of this is that human capital is now at the heart of debates concerning economic performance and workforce development.

Human capital has for a long time been seen as a major factor in promoting productivity and growth. According to classical human capital theory [1, 2], education and training are regarded as investments which enhance individual capabilities and result in improved economic outcomes. In this view, human capital is primarily defined by formal education, accumulated experience, and skills that are specific to a job. This approach was suitable for the industrial era, a time when the demands in terms of skills were relatively stable and career paths were more predictable. It might, however, fail to reflect the actual situation in today's digitally driven environment.

In light of the continuous technological changes, both organizations and governments have undertaken considerable measures to enhance the quality of their human capital. Such efforts usually involve updating the education systems, incorporating digital and soft skills into training schemes, and providing more opportunities for lifelong learning. Universities and training institutions are likewise adjusting themselves so that they can prepare students for work in digitally mediated environments [3, 4, 5]. However, although these reactions are important, they generally adopt an 'augmentation' approach, which means that new digital skills are simply added to the existing frameworks without challenging the fundamental assumptions regarding the definition of human capital.

Meanwhile, digital transformation is starting to question some of the basic assumptions of the traditional approach. Skills grow out of date more rapidly, career trajectories become less secure, and workers are being required more and more to adapt to new technologies and working arrangements. Furthermore, since artificial intelligence is playing a greater role, human abilities are no longer used on their own but are instead used in conjunction with digital systems. This means that doubts arise as to whether human capital can still be regarded as a fixed stock of knowledge gathered over time.

Even though there has been a considerable amount of research carried out on digitalization and skills, fairly little attention has been paid to the way in which these changes impact the basic assumptions of human capital theory. Most of the current literature is concerned with identifying new kinds of skills rather than with looking again at the concept of human capital in a more fundamental sense. It therefore seems necessary to carry out a more systematic review of how human capital should be understood in the digital age.

The paper fills this gap by presenting a conceptual analysis of human capital within the context of digital transformation. Instead of viewing digital skills as just another element, the study looks at how technological change alters the main aspects of human capital. Specifically, it suggests three kinds of shift: a move from static skills to adaptive capabilities, a change from a one-off investment in education to continuous learning, and a transition from individual expertise to more relational and technology-mediated kinds of capability.

Although similar ideas have been looked at in various areas of literature, they are generally treated apart. Research into dynamic capabilities, for example, is concerned with how companies adjust to changing environments, but gives only limited consideration to the way human capital is understood. Investigations into lifelong learning stress the need for ongoing skill development, yet usually present it as an extension of the current models rather than as a change in the basic assumptions. In a similar way, social capital theory underlines the importance of relationships and networks, but does not fully take into account how these dynamics are influenced by digital technologies and human-machine interaction.

By taking a more integrative approach the study brings these different viewpoints together. Instead of suggesting completely new elements it combines the existing insights into three closely related changes: a shift from accumulated stock to adaptive capability, from a one-time investment to continuous development, and from individual attributes to relational and digitally embedded forms of capability. The paper thus provides a clearer and more coherent means of understanding the way in which human capital is being transformed in the digital era.

This paper presents two major contributions. The first of these is a contribution to the theoretical literature in that it proposes an integrated framework which combines the three interrelated changes in the way human capital is understood in the digital age. Through drawing on insights from various areas of the literature, the study offers a more coherent approach to connecting adaptability, continuous development, and relational embeddedness. The second contribution consists of setting out practical implications for organisations,

educational institutions, and policymakers, especially regarding how to support workforce development in the face of continuous technological change.

2. THEORETICAL BACKGROUND

2.1. Classical human capital theory

Human capital theory (HCT) is one of the most commonly employed frameworks for explaining the role of human capabilities in economic outcomes. The work of Schultz [1] and Becker [2] changed the way in which education and training were seen, turning them from being merely social activities into being regarded as kinds of economic investment. On this basis, individuals invest in education, training and health so as to boost their productivity and enhance their future income.

In this context, human capital is usually understood to mean the knowledge, skills, and experience which individuals gain over time. It is regarded as a kind of capital since it is expected to yield returns, just like physical or financial assets. Mincer [6] backed this view by demonstrating a consistent link between the number of years of schooling, work experience, and earnings. Hence, human capital theory has for a long time stressed the notion that greater investment in education results in better economic outcomes.

Nevertheless, in addition to these main ideas, the traditional approach is also based on a number of underlying assumptions regarding the way human capital functions in reality. It takes it for granted that skills stay fairly stable over time and that the knowledge acquired through formal education can therefore be used throughout a person's career [2, 6]. There is also an unspoken assumption of a direct relationship between investment and return, according to which greater levels of education are likely to result in foreseeable increases in productivity and income [2, 7]. Furthermore, human capital is seen as something that builds up over time as a result of ongoing investment in education and training [1, 2]. Lastly, the theory generally regards human capital as something that is part of the individual, with a main emphasis on personal knowledge and abilities rather than on wider social contexts [2, 8, 9].

These assumptions were mostly in line with the circumstances of the industrial economy, in that technological change proceeded at a slow pace and the types of jobs were more stable. Under those conditions, education and experience offered a fairly dependable basis for securing long-term employment and earning an income. But now that economic conditions are still changing, particularly due to the growth of digital technologies, it is necessary to question whether or not these assumptions are still valid.

2.2. Limitations of classical human capital theory in the digital era

Even though classical human capital theory offers a useful basis, its basic assumptions lose their credibility when it is applied to the situation of digital transformation. These assumptions were originally made under conditions which are very different from those in today's labour market, in particular with regard to the speed of technological change and the way in which work is organised. Since digital technologies keep on altering economic activities, various limitations of the traditional approach become more apparent.

It is now increasingly difficult to hold on to the idea that skills stay relatively stable over time. In the industrial world, the knowledge acquired through education could usually be put to use for many years, requiring only minor adjustments [10]. Nowadays, in the digital age, the rapid pace of technological change greatly reduces the length of time during which existing skills remain relevant [11]. The move towards Industry 5.0 signifies a shift beyond mere efficiency, placing greater importance on human well-being and sustainability. Under these circumstances, researchers speak of a constant transformation of the employee experience

[12]. Consequence of this is that human capital can no longer be regarded as something that depreciates slowly and in a predictable manner.

Secondly, the traditional perspective supposes a fairly clear and straightforward link between investment in education and economic rewards. That is to say, greater education is thought to result in better job prospects and a higher income. Although this kind of relationship still holds, it has become less stable in the digital age [13]. The growth of platform-based work, short-term contracts, and insecure employment has added more uncertainty to conventional career routes [14]. As a result, people who have comparable levels of education may end up with very different career outcomes according to the way they adjust to changes in the labour market.

Third, the notion that human capital builds up in a steady and continuous manner is also under challenge. Rather than just adding new skills onto those they already have, workers frequently have to revise or even replace the skills they had previously acquired, since skills become outdated more rapidly in the digital age [15]. This indicates that the development of human capital is not merely a matter of accumulation, but also involves adjustment and reconfiguration over time.

In the end, classical human capital theory usually views skills as characteristics that are possessed by individuals [1, 2]. Yet nowadays many types of work are becoming more and more influenced by collaboration, digital platforms, and networked methods of production [16, 17]. Productivity is determined not just by what each individual knows but also by the way in which they work with one another and by the way they interact with digital technologies [11, 18]. As a result, it becomes harder to see human capital as something entirely individual and the role of context in shaping capability and performance is therefore more important.

All of these points indicate that the conventional assumptions of human capital theory are not well suited to explaining the way in which skills function in the digital age. Instead of considering human capital as something stable, accumulated, and unique to the individual, it might be more appropriate to regard it as one that is constantly changing and influenced by wider technological and organizational circumstances.

3. METHODOLOGY

The study makes use of a conceptual integrative review method in order to look again at the assumptions of classical human capital theory in the digital age. This is because, as Torraco (2016) [19] points out, integrative reviews are well suited to cases in which the insights are spread throughout various areas of the literature and where the aim is to achieve a more coherent conceptual understanding.

Instead of trying to summarize all the existing studies, this paper concentrates on gathering together the most relevant contributions concerning the changing character of work in the context of digital transformation. The review is based on three main areas of literature: classical human capital theory, the research into digital transformation and changes in the labour market, and other viewpoints such as lifelong learning, dynamic capabilities, and social and relational capital.

The analysis is based on a process of comparison and synthesis. Initially, the basic assumptions of classical human capital theory are determined. These are then compared with recent empirical and theoretical findings regarding digital transformation. As a result, various patterns and tensions are noticed. Lastly, these patterns are divided into three wider shifts which offer a more comprehensive approach to understanding human capital in the digital age.

As a conceptual study, the paper is not intended to carry out empirical testing but rather to provide a structured reinterpretation which can act as a basis for future empirical research.

4. RETHINKING HUMAN CAPITAL IN THE DIGITAL ERA

Although the earlier section points out various limitations of the traditional view of human capital, these problems are not separate from one another. On the contrary, they are based on a smaller number of fundamental changes in the way human capital is organised and developed in the digital age. The present section combines these changes into three wider dimensions.

4.1. From accumulated stock to adaptive capability

Traditional human capital theory usually considers human capital to be a kind of accumulated stock. People make investments in education and training, thereby developing a set of skills which can then be used over time. The theory assumes that once such skills have been acquired they remain relevant for a fairly long time and lose value only slowly.

Yet, it becomes more and more difficult to hold on to this assumption in the light of rapid technological change. Empirical evidence shows that the rate at which skills become outdated has increased considerably during the digital age. It has been estimated that the average length of time that skills last has now dropped to about 2 to 5 years. It is believed that nearly 40% of current skills will change or become obsolete within five years as artificial intelligence and digital technologies spread throughout industries [20, 21]. These estimates are generally based on employer self-report surveys and on forward-looking predictions, and they depend on different definitions of what counts as a "skill" or a "skill change". Therefore, they should be seen as showing general trends rather than as exact measurements. In numerous instances, technical skills which were previously valuable can cease to be relevant in a relatively short period of time [22, 23]. This means that the notion of a stable and lasting skill base is increasingly at variance with the way work is developing today.

The value regarded in the labour market also changes. Instead of placing primary emphasis on fixed technical expertise, greater importance is now given to the ability to respond to change. This involves having the capacity to adjust to new technologies, cope with unfamiliar tasks, and work in changing working environments. In this way, human capital is not any longer mainly determined by what individuals know, but by the extent to which they can adapt. Moreover, it goes beyond technical expertise to cover wider abilities such as cognitive flexibility, problem-solving, and socio-emotional skills which allow individuals to function effectively in rapidly changing environments.

At the same time, these changes are occurring within a wider context in which work is becoming more flexible and less predictable. Professional roles and the way tasks are organised are no longer fixed, and people are frequently required to take on a variety of different functions and responsibilities at various times [24]. This in turn strengthens the need to go beyond a static view of human capital.

Put together, these developments indicate that the traditional idea of human capital as a stable build-up of skills is no longer adequate. A better way of looking at it is to see human capital as a dynamic and adaptive ability, one that is shaped by the capacity to respond to continuous technological and organizational change.

4.2. From linear investment to continuous development

The traditional theory of human capital supposes that there is a fairly clear and direct link between investment in education and the economic rewards obtained. When individuals undertake formal education and training at the beginning of their careers, it is expected that these investments will over time yield steady returns in the shape of higher productivity and income. According to this model, there is a foreseeable progression, with greater levels of education usually leading to better employment results.

But the linear relationship becomes less reliable in the context of digital transformation. The changes in labour market structures, such as the growth of platform work and more flexible forms of employment, have led to greater variability in career paths [25, 26]. Empirical data from the OECD countries shows this increasing inconsistency: although people with tertiary education still earn on average 50 to 60 per cent more than those with upper secondary education, the income gap among individuals at the same educational level has widened considerably [27]. This means that a university degree no longer ensures a consistent economic return. Although these comparisons offer useful insights, they rely on cross-country statistical harmonisation and might reflect differences in the methods of measurement and in the structure of the labour market. At the same time, the proportion of middle-skill jobs among total employment has declined, indicating continued job polarisation [13]. These trends show that similar educational investments can result in very different economic outcomes.

Moreover, the speed at which technology is changing also undermines the idea that a one-off investment is reasonable. Although the issue of skills becoming outdated has already been mentioned, the point it raises here is that the returns from initial education become unstable. Since the relevance of skills lasts for a shorter period, the value obtained from early investment is less likely to be maintained over time. This therefore calls into question the belief that human capital can be developed through a single, front-loaded investment phase.

In this situation, the development of human capital is not any longer just a simple case of accumulation, but requires constant revision and reconfiguration of skills as time goes on [15, 16]. Instead of merely building on the knowledge already possessed, people are now more and more expected to update, modify and, in some cases, replace the competencies they have previously acquired. As a result, continuous upskilling and reskilling are not only a reaction to changes in job requirements, but have increasingly become strategic priorities for keeping the workforce relevant and for enhancing organizational competitiveness [28]. This shows a move from seeing learning as an isolated investment to considering it as a continuous and essential condition for maintaining the value of human capital.

When put together, these developments indicate that the traditional idea of human capital as the outcome of a single investment is no longer sufficient. On the other hand, human capital should be seen as a process of continuous development, and the connection between investment and return is less certain and has to be maintained over time

4.3. From individual capital to relational and digitally embedded capability

Traditional human capital theory mostly regards human capital as a characteristic that is part of individuals. Skills, knowledge, and experience are seen as personal assets which individuals acquire and carry over from one job to another and from one organization to another. The view taken in this approach is that productivity is mainly a result of what individuals know and can do by themselves.

But the focus on the individual becomes less adequate in the context of digital transformation. Today's work is more and more based on collaboration, digital platforms, and interconnected systems. This change is shown by the increasing incorporation of technology into working practices. It is estimated that as much as 60–70% of present work activities could be enhanced or altered by artificial intelligence and other related technologies [29]. These estimates are generally derived from task-level modelling and rely on certain scenario assumptions, and may not fully take into account variations between sectors or the speed at which the technologies are adopted in the real world. It may be stated that individual performance is influenced not only by personal expertise but also by the effectiveness with which individuals interact with one another, gain access to shared resources, and function within digitally mediated environments.

Often, people do not work alone but as part of distributed teams, through cross-functional collaboration, and via interactions mediated by platforms. Digital technologies have made it possible to establish new kinds of coordination which go beyond the usual organizational boundaries. This change is part of a more general transformation. Economic value is now created both by individual expertise and by relational connections as well as by capabilities that are embedded in technology [16]. In this context, value arises from relational capital, which involves the trust and the interactions between the various actors. In this type of environment, the capacity to bridge network gaps is just as important as formal expertise [30].

At the same time, as artificial intelligence becomes more closely integrated into working practices it is also altering the character of human contribution. Instead of completely replacing human labour, a great many AI systems operate together with human workers, helping to improve decision-making and allowing for new methods of carrying out tasks. Recent empirical studies indicate that these 'human-in-the-loop' arrangements can result in substantial improvements in both speed and the quality of output, especially when it comes to complex analytical tasks [31]. In these kinds of situations, productivity is determined not just by the individual's knowledge but also by the effectiveness with which individuals are able to collaborate with intelligent systems in order to co-create value.

Figure 1. Three shifts in the conceptualization of human capital in the digital era

OLD VIEW	→	NEW VIEW
Human capital as accumulated stock (education, skills)	→	Human capital as adaptive capability
Linear investment (front-loaded education)	→	Continuous development (lifelong learning, reskilling, upskilling)
Individual capital	→	Relational and digitally embedded capability (networks, platforms, human-machine interaction)

Source: Author's compilation, 2026

Table 1 summarizes the three proposed shifts and maps them to their key supporting references in the literature.

Table 1. Conceptual shifts and supporting literature

Shift	Description	Key supporting literature
From accumulated stock to adaptive capability	Human capital shifts from a fixed stock of knowledge to the ability to adapt, learn, and respond to technological change and AI-driven transformation	[20], [21], [22]
From linear investment to continuous development	Human capital is no longer formed only through initial education, but requires continuous reskilling and adaptation across the life course	[15], [13], [26], [27]
From individual capital to relational and digitally embedded capability	Human capital increasingly depends on networks, social structures, and human-machine interaction in digitally mediated environments	[16], [30], [31]

Source: Author's compilation, 2026

5. IMPLICATIONS FOR SOCIAL INCLUSION

The kinds of changes mentioned in the previous section have significant consequences for social inclusion in the digital age. Since human capital is shifting from being based on a fixed stock of knowledge to becoming more adaptable, continuously developed, and relational, the circumstances under which people can take part in the labour market are also being altered. However, these changes do not impact everyone in the same way; rather, they modify the way in which opportunities are obtained and maintained, usually in an uneven manner.

5.1. Inequalities in access to adaptive capabilities

The greater the importance placed on adaptability as a component of human capital, the more significant the differences become in people's ability to cope with change. Generally, people who have a stronger educational background, a higher degree of digital literacy, and better access to learning materials are more able to adjust to developing technologies and changing job demands. On the other hand, individuals whose foundations are weaker or who have more restricted access to training may find it hard to keep up with these changes.

The fact that this change indicates that the digital divide cannot any longer be understood merely in terms of access to technology also shows that there are differences in people's ability to adapt over time. Consequences of this are that participation in the labour market depends not just on the initial access one has but also on one's ability to stay relevant in situations involving constant change.

5.2. Inequality in continuous development opportunities

Shifting from a one-off investment in education to one that involves continuous development also changes the way opportunities are distributed. In the previous kinds of systems, education usually offered a fairly stable route to both a job and income. But since the demands for skills are now changing more quickly, learning has to become a continuous process rather than a separate stage.

In reality, access to ongoing learning opportunities is unequal. People in more stable or higher-skilled positions are more likely to get training and development support, whereas those in temporary or lower-skilled jobs usually encounter more difficulties. As a result, there is a build-up over time whereby some people are able to keep updating their skills while others fall behind.

In this situation, it becomes harder to maintain social mobility. Social mobility is no longer based simply on entering the labour market, but rather depends all the more on one's ability to remain competitive through continuous learning.

5.3. Relational exclusion in digitally embedded systems

Now that work is more and more based on networks and mediated through digital means, human capital is not merely determined by the qualities of the individual but is instead based on one's ability to access and function within networks, platforms, and collaborative systems.

People who have many connections usually get better access to information, resources, and opportunities, while those who are less well connected may experience disadvantages even if they have the same amount of formal education or technical expertise. On this basis, inequality is influenced not just by what individuals know but also by the position they hold in wider relational structures.

Meanwhile, digital platforms and algorithmic systems are having a greater and greater impact on the way work is assigned and assessed. In order to take part in these systems, people need not only technical ability but also the skill to understand their basic logic. This therefore

introduces an additional dimension to the question of social inclusion, since individuals have to interact effectively with both social networks and technological infrastructure.

5.4. Implications for higher education and institutional roles

Higher education institutions are now being transformed in more practical terms. Simply providing knowledge is not enough any longer in situations where skills tend to become obsolete; instead, they have to help develop adaptive abilities, such as the capacity to learn, make adjustments, and apply knowledge in changing environments. Curriculum design can show this, for instance, by including more problem-based learning, interdisciplinary material, and real-world projects.

In addition, the move towards continuous development implies that education should not be confined to one stage of life. As a response, universities can provide more flexible learning options, for example through modular programs, short courses, and chances for people to re-enter study. Such opportunities enable individuals to keep their skills up to date rather than depending solely on their first degree.

Moreover, institutions have an important role to play in linking learners to wider contexts, this involving greater cooperation with industry and also giving students access to digital tools and platforms on which they can get hands-on experience with emerging technologies. Since work is becoming more based on networks, such connections are becoming all the more important for the development and application of human capital.

Assessment methods might also have to change. Instead of concentrating primarily on how much knowledge is retained, more attention can be paid to the way in which people learn, adapt, and apply what they know in various situations. This in turn brings educational outcomes in line with the evolving characteristics of human capital in the digital age.

6. CONCLUSION

6.1. Conclusion

The paper looks at the idea of human capital in the context of digital transformation. Although the current literature usually expands the traditional framework by including digital skills, it seldom challenges the assumptions on which that framework is based. In order to fill this gap, the study suggests a change in the way human capital is conceived.

The paper points out three closely related changes: a shift from accumulated stock to adaptive capability, from a one-off investment to continuous development, and from individual attributes to forms of capability that are relational and digitally embedded. Taken together, these changes indicate that human capital is not any longer a stable, individual asset but a dynamic and context-dependent process.

This new way of thinking also has significant implications for social inclusion; as the conditions necessary for maintaining economic relevance change, inequalities become more determined by differences in adaptability, access to ongoing learning, and one's position within networks and digital systems, thereby showing the need to go beyond conventional measures of education and skills when examining inequality in the digital age.

Since it is intended as a conceptual study, this paper includes no empirical testing; further research might look at how these dimensions of human capital function in different contexts and the way in which they interact with emerging technologies such as artificial intelligence.

The paper as a whole argues that human capital should be seen as something that is constantly changing and depends on the particular context, rather than as a fixed entity. This view might provide a more useful means of understanding both work and inequality in the digital age.

6.2. Limitations

The study has a number of limitations. Firstly, since it is a conceptual one, it involves reviewing and reinterpreting the existing literature rather than offering empirical verification. The three suggested changes are based on theoretical integration and must therefore be seen as a framework upon which further research can be carried out rather than as relationships that have been empirically tested.

Second, the analysis is selective rather than comprehensive. Although the paper refers to important contributions from various areas of the literature, it does not intend to include all the views on human capital or digital transformation. Because of this, some relevant perspectives might not be fully covered.

Third, a great deal of the supporting evidence comes from studies and reports that are based in advanced economies, especially those of the OECD. This could result in a bias favouring the Global North, since the processes of digital transformation and the development of human capital can vary greatly depending on the institutional and developmental contexts.

Future studies might overcome these limitations by carrying out empirical tests of the proposed framework and by looking at its applicability in different areas and economic conditions.

REFERENCES

[1] T. W. Schultz, “Investment in human capital,” *The American Economic Review*, vol. 51, no. 1, pp. 1–17, 1961.

[2] G. S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, University of Chicago Press, 1964.

[3] I. van der Spoel, O. Noroozi, E. Schuurink, and S. van Ginkel, “Don’t Wait, Innovate! Preparing Students and Lecturers in Higher Education for the Future Labor Market,” *Education Sciences*, vol. 12, no. 9, Art. no. 620, 2022, doi: https://doi.org/10.3390/educsci12090620

[4] H. Cook, T. Apps, K. Beckman, and S. Bennett, “Digital competence for emergency remote teaching in higher education: Understanding the present and anticipating the future,” *Educational Technology Research and Development*, vol. 71, no. 1, pp. 7–32, 2023, doi: https://doi.org/10.1007/s11423-023-10194-4

[5] T. Varga-Atkins, “Beyond description: In search of disciplinary digital capabilities through signature pedagogies,” *Research in Learning Technology*, vol. 28, 2020, doi: https://doi.org/10.25304/rlt.v28.2467

[6] J. Mincer, *Schooling, Experience, and Earnings*, Columbia University Press, 1974.

[7] G. Psacharopoulos and H. A. Patrinos, “Returns to investment in education: A further update,” *Education Economics*, vol. 12, no. 2, pp. 111–134, 2004, doi: https://doi.org/10.1080/0964529042000239140

[8] J. S. Coleman, “Social capital in the creation of human capital,” *American Journal of Sociology*, vol. 94, pp. S95–S120, 1988, doi: https://doi.org/10.1086/228943

[9] P. Bourdieu, “The forms of capital,” in *Handbook of Theory and Research for the Sociology of Education*, Greenwood Press, 1986, pp. 241–258.

[10] K. V. W. Stone, *From Widgets to Digits: Employment Regulation for the Changing Workplace*, Cambridge University Press, 2004.

[11] E. Brynjolfsson and A. McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, W. W. Norton & Company, 2014.

[12] M. Breque, L. De Nul, and A. Petridis, *Industry 5.0: Towards a Sustainable, Human-Centric and Resilient European Industry*, Publications Office of the European Union, 2021, doi: https://doi.org/10.2777/308407

[13] D. H. Autor, "Why are there still so many jobs? The history and future of workplace automation," *Journal of Economic Perspectives*, vol. 29, no. 3, pp. 3–30, 2015, doi: https://doi.org/10.1257/jep.29.3.3

[14] A. L. Kalleberg, Good Jobs, *Bad Jobs: The Rise of Polarized and Precarious Employment Systems in the United States*, 1970s to 2000s, Russell Sage Foundation, 2011.

[15] World Economic Forum, *The Future of Jobs Report 2020*, World Economic Forum, 2020.

[16] M. Castells, *The Rise of the Network Society*, 2nd ed., Wiley-Blackwell, 2010.

[17] Y. Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, Yale University Press, 2006.

[18] T. H. Davenport and J. Kirby, *Only Humans Need Apply: Winners and Losers in the Age of Smart Machines*, HarperBusiness, 2016.

[19] R. J. Torraco, "Writing integrative literature reviews: Using the past and present to explore the future," *Human Resource Development Review*, vol. 15, no. 4, pp. 404–428, 2016, doi: https://doi.org/10.1177/1534484316671606

[20] OECD, *OECD Skills Outlook 2023: Skills for a Resilient Green and Digital Transition*, OECD Publishing, 2023.

[21] UK Department for Education, *The Impact of AI on UK Jobs and Training*, HM Government, 2023.

[22] N. Drydakis, "Artificial intelligence capital and employment prospects," *Oxford Economic Papers*, vol. 76, no. 4, pp. 901–919, 2024, doi: https://doi.org/10.1093/oep/gpae005

[23] A. Sandblad, "On professional skill in the age of digital technology: What happens when work is instrumented with technology," *AI & Society*, vol. 38, pp. 1925–1933, 2023, doi: https://doi.org/10.1007/s00146-023-01668-3

[24] S. Bankins, X. Hu, and Y. Yuan, "Artificial intelligence, workers, and future of work skills," *Current Opinion in Psychology*, vol. 58, Art. no. 101828, 2024, doi: https://doi.org/10.1016/j.copsyc.2024.101828

[25] J. Wood, M. Graham, V. Lehdonvirta, and I. Hjorth, "Good gig, bad gig: Autonomy and algorithmic control in the global gig economy," *Work, Employment and Society*, vol. 33, no. 1, pp. 56–75, 2019, doi: https://doi.org/10.1177/0950017018785616

[26] G. Standing, *The Precariat: The New Dangerous Class*, Bloomsbury Academic, 2011.

[27] OECD, *Education at a Glance 2019: OECD Indicators*, OECD Publishing, 2019.

[28] M. Jaiswal, A. Arun, and A. Varma, "Rebooting employees: Upskilling for artificial intelligence in multinational corporations," *The International Journal of Human Resource Management*, vol. 33, no. 6, pp. 1179–1208, 2022, doi: https://doi.org/10.1080/09585192.2021.1891114

[29] McKinsey Global Institute, *The Economic Potential of Generative AI: The Next Productivity Frontier*, McKinsey & Company, 2023.

[30] R. S. Burt, *Brokerage and Closure: An Introduction to Social Capital*, Oxford University Press, 2005.

[31] F. Dell'Acqua, E. McFowland III, E. Mollick, H. Lifshitz-Assaf, K. C. Kellogg, S. Rajendran, L. Krayer, F. Candelon, and K. R. Lakhani, "Navigating the jagged technological frontier: Field experimental evidence of the effects of AI on knowledge worker productivity and quality," *Harvard Business School Working Paper*, no. 24-013, 2023, doi: https://doi.org/10.2139/ssrn.4573321