UNDERSTANDING THE VERSATILE IMPACTS OF AI ON COMPETENCY DEVELOPMENT

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Summary

Artificial Intelligence (AI) has caused significant changes and important developments have been made in accessibility by customising learning. This paper discusses AI's facilitating and destructive roles in developing competencies. While AI-supported tools promote personalised learning, real-time feedback and interdisciplinary cooperation, they also bring challenges like decreasing intrinsic motivation, dissolving the natural learning process by causing overreliance and sabotaging competency development. This study emphasises the importance of the usage of AI as more of a supportive tool while using it in developing human competencies. For this reason, supporting holistic approaches that combine the efficiency provided by AI and human skills, promoting autonomy and engagement, and a lifelong learning culture is suggested. It is emphasised that individuals can demonstrate a more dynamic and balanced competency development while preparing for future needs, by taking these suggestions into consideration and utilizing the AI's potential at the highest level.

Keywords: artificial intelligence, competency, learning, development, intrinsic motivation.

JEL classification: O33, J24, L86, D83

1. INTRODUCTION

1.1. Background and Context

The advent of AI has caused significant changes in learning and professional development. Since the first applications in automation and data processing, now AI has become a multipurpose tool enabling personalisation, cooperation and promotion of competency development between industries (Mena-Guacas vd., 2023). This technological revolution has not only transformed the traditional learning environments but also redefined the nature of business dynamics. As an example, today AI plays a critical role in decision-making and enables the processing of complex databanks efficiently and unprecedentedly (Chen, 2024).

Even though AI clearly contributes to efficiency and accessibility, it also brings critical challenges to competency development. As long as organisations and individuals adopt AI-supported solutions, it is identified that there is an increasing need to understand the effect of AI on basic competencies like critical thinking, problem-solving and emotional intelligence (Mary & Niese, 2022). These changes highlight the urgency of adopting learning systems and workforce training programmes to meet the demands of an AI-driven future.

1.2. Problem Statement

Despite the transformative potential of AI, there are various problems in developing the competencies. One of the most urgent problems is the risk of overreliance in AI systems which decreases the intrinsic motivation and independent problem-solving capacity (Babashashi et al., 2024). Also, the usage of AI in learning environments creates an illusion that users generally perceive themselves as more competent than they are. Thus this situation can prevent long-term competency development and adaptability which are critical for dynamic, complex and unpredictable business scenarios (Xiao et al., 2024).

Another challenge is based on the accessibility of AI tools. While these technologies offer more democratised learning opportunities, inequalities in accessing AI-based platforms may worsen the current inequalities already exist. Communities with limited resources may be also excluded from resources to integrate those tools effectively and so the gap between socioeconomic groups may increase (Chen, 2024).

1.3. Objectives and Scope

This study aims to identify the bilateral role of AI in both the facilitating and destruction of competency development. It also aims to provide a balanced perspective on the effects of AI on learning and workforce training by investigating positive contributions such as advanced accessibility, personalisation and interdisciplinary learning besides the limitations of AI. This analysis is specifically important considering the ongoing discussions on the ethical and practical dimensions of AI integration (Mena-Guacas et al., 2023).

The scope of this study includes an in-depth examination of current literature and case studies to determine the trends and challenges that emerged in AI-oriented

competency development. Also, strategies are also mentioned to promote a balanced approach that highlights the strength of AI while addressing the shortcomings.

1.4. Methodology

The methodology of this study is based on a comprehensive literature review consisting of peer-reviewed papers, conference proceedings and academic publishings. The resources are selected according to their suitability, accessibility and contributions to understanding the effects of AI in competency development. In the study, thematic analysis is used to identify the recurring patterns and insights in various areas including work, learning, organisational behaviour and adopting technology. This methodological approach enables understanding the concpet in a holistic way by integrating the perspectives of academic and industrial stakeholders. The study synthesises the insights and aims to present suggestions for policy-makers, individuals and organisations confused about AI integration.

2. THEORETICAL FRAMEWORK

2.1. Competency Development in the Digital Era

In today's rapidly changing digital world, competency development is the keystone of personal and professional development. Generally, competency is defined as the combination of knowledge, skills, attitudes and behaviours that enables individuals to perform effectively (Woodruffe, 1993). The definition of competency is expanded today, including essential qualifications like digital literacy, adaptability and critical

thinking which support individuals to deal with technological developments.

The digital era offers unique opportunities to develop competencies. E-learning platforms, virtual reality simulations and real-time feedback algorithms have created a significant revolution in individual skill development methods. As an example, personalised learning tools increase engagement and persistence by providing the ability for students to ensure specific learning goals and experiences (Salas, Tannenbaum, Kraiger & Smith-Jentsch, 2022). Furthermore, these tools close the gap between socioeconomic limitations by democratising accessibility.

But these opportunities also bring challenges. Overreliance on technology for learning activities can cause superficial engagement in which individuals passively consume information instead of critically analysing it. Also, the rapid evaluation of technology requires continuous development of new skills and the individuals may become disinterested from a point. This situation has now become apparent in areas in which automation avoids traditional learning styles and rapidly changes the work requirements (Park, Fritz & Jex, 2011).

From this perspective, a balanced approach is a must to overcome those challenges. Digital tools need to be used as facilitators instead of basic learning tools. Promoting tools which prioritise intrinsic motivation will provide more sustainable learning and development. For instance, organisations can build a holistic development ecosystem which supports long-term growth by applying hybrid models that combine digital tools with mentorship.

2.2. Self-Determination Theory

Self-Determination Theory (SDT) is a psychological framework which comprehensively investigates human motivation, personality development and psychological well-being. The theory, developed by Edward L. Daci and Richard M. Ryan in the 1980s, emphasises the role of intrinsic motivation and fulfilment of basic psychological needs in fostering optimal functioning and personal development (Deci & Ryan, 1985, p.229). The central of this theory is the understanding that human is focused on growth in nature and seek environments which support their psychological needs. While fulfilled needs contribute to increased motivation and well-being, disappointments decrease functioning and can cause distress.

SDT defines three basic psychological needs: autonomy, competency and relatedness. Autonomy is the sense of control over our own actions and decisions (Gagné & Deci, 2005). Autonomy refers to the sense in which a person feels strong, free from external control, and it reflects the desire to act aligned with the authentic self. On the other hand, competency refers to the need of feeling effective and capable while experiencing the challenges in one's environment. Relatedness encompasses the human drive to connect with others in meaningful ways, fostering a sense of belonging and care (Deci & Ryan, 2000). Together those needs are considered essential and universal to promote personal development and protect psychological integrity regardless of culture and individual differences. Satisfying those needs provides a basis for understanding the motivational sustainability SDT defines.

According to SDT, motivation exists on a spectrum ranging from intrinsic to extrinsic. While intrinsic motivation arises when activities are inherently enjoyable and interesting, external pressures and rewards lead to extrinsic motivation. However, all the extrinsic motivations are not the same, because SDT defines subcategories which change the internalisation degree of the extrinsic motives. When individuals are motivated by intrinsic or well-internalised extrinsic factors, they possibly tend to be more engaged, more creative and more persistent. This underlines the practical outcomes of the theory (Ryan & Deci, 2000).

This understanding of motivation has important applications in various areas including education, health, workplace and sports. For instance, in education, it is shown that environments supporting the autonomy, competency and relatedness of students promote intrinsic motivation and increase academic performance and satisfaction (Niemiec & Ryan, 2009). Likewise, healthcare service interventions based on SDT principles focus on increasing the adherence of the patients to medication regimes by considering these basic psychological needs. They promote patient satisfaction and better health outcomes by doing this (Ng et al., 2012). These examples demonstrate the versatility of SDT in discussing the challenges in the real world.

Furthermore, workplaces that adopt leadership styles supporting autonomy in the guidance of SDT generally report higher levels of employee and work satisfaction, and performance and lower levels of burnout (Deci, Olafsen & Ryan, 2017). Similarly in sports, fulfilling the autonomy,

competency and relatedness needs of sportives can increase general well-being (Vallerand, 2007). These findings emphasise the interdisciplinary interest of SDT by demonstrating how promoting supporting environments can cause better results in different concepts.

Even though it has strengths, SDT was criticised for its practicalibility in different cultural contexts. Some researchers discussed how cultural differences affected the emergence of those psychological needs (Chirkov vd., 2003). This situation raised the problem of how autonomy, competency and relatedness listed in SDT can be supported or compelled, and how they can be improved in modern-day digital and virtual environments.

While SDT emphasises the potential of well-designed learning environments, the rise of AI brings challenges to those psychological needs. Badly designed AI systems can prevent autonomy by offering single-track learning opportunities which limit personal choices. Similarly, feedback generated by AI tools can not be personal sometimes and it could decrease the sense of competence. Furthermore, relatedness can be blocked regarding the sense of isolation learners experience because AI-supported environments have no human interaction (Hutmacher & Appel, 2023). To address these challenges, designing SDT-adopted AI systems is critical. Understanding the importance of the relationship between SDT and AI and creating a suitable integration can turn AI into a strong tool to support intrinsic motivation and effective competency development.

2.3. Destructive Effects of AI

The concept of destruction defines generally unpredictable changes that challenge current systems and processes. In the context of competency development, AI presents a sharp double-edged spear. While it offers innovative learning and skill development solutions, it also brings complexities which destroys traditional paradigms (Brynjolfsson & McAfee, 2014, p. 165-172).

AI-supported tools created a revolution in learning and education by providing personalised learning experiences and real-time insights related to performance. For instance, adaptable learning platforms analyse personal progress and lead learners to consider their skill gaps effectively by offering unique resources (Smith & Anderson, 2020). These tools can also offer measurable learning and development programmes which can easily be accessible and low-cost.

However, there are disadvantages to the nature of AI. One of the biggest concerns is the "tech-dependency" phenomenon that causes overreliance on automation, it destroys the need for problem-solving and critical thinking of individuals. For example, automatic decision-making processes can cause a decrease in the analytical thinking skills of individuals if they are so used to making the automation perform the cognitive tasks (Ford, 2015). The tech-dependency effect causes long-term risks, especially in competency development in areas where adaptation and innovation are required.

Psychological effects turns the destructive effects of AI into a more complex situation.

Rapid integration of AI technologies generally cause a sense of uncertainty and concern among learners and professionals. As Noble mentioned in her book "*Algorithms of Oppression: How Search Engines Reinforce Racism*" (2018), the phenomenon known as "technologic disruption anxiety" may weaken the motivation and limit learning outcomes. In addition, ethical concers like algorithmic biases results in questions about the fairness and comprehensiveness of AI-based learning tools.

Another challenge about AI is its destruction potential on intrinsic motivation. When learners trust in AI so much, they may loose the instinct of exploring and solving the problems independently. This challenge has an utmost importance in specifically from the perspective of which success is required for creativity and critical thinking. Research shows that overreliance on AI can cause a decrease in self-competence and worsen competency development challenges (Hutmacher & Appel, 2023).

To eliminate such challenges, a balanced approach in AI integration is essential. Organizations and trainers needs to adopt human-centric design principles which prioritise learners' needs and well-being. For instance, AI systems need to be designed to complete the humanistic skills by promoting active and critical engagement, instead of replacing them. Also promoting digital flexibility such as adopting technological developments easily and the ability to lead these changes can support individuals develop themselves in such destructive environments. As a result, while AI offers a transformative potential in competency development, its destructive

effects must be assessed correctly and a sensible integration must be suggested.

3. EFFECTS OF AI APPLICATIONS ON COMPETENCY DEVELOPMENT

3.1. Positive Contributions of AI

It is widely recognised that AI is a revolutionary reality of today in competency development by increasing the accessibility, efficiency and personalisation in education and professional development. AI-supported tools such as adaptable learning platforms provide unique learning experiences in accordance with learner's specific needs. Adaptable algorithms are able to offer customised resources for individual performance monitorization and development, thus engagement and quality of information saved to increase the performance may efficiently be developed (Mena-Guacas et al., 2023). Also, AI-based virtual simulations enable experimental learning in technical areas, especially health and engineering (Mady & Niese, 2022).

Additionally, AI is able to develop cooperation in competency development linking learners globally to each other through digital tools promoting teamwork and critical thinking. Platforms which facilitate group projects and peer conversations promote a more interactive and interesting learning environment (Mena-Guacas et al., 2023). Also, AI enables trainers to provide more highly valued development content with its scoring and automatised repeating task-assigning capability (Tenório & Romeike, 2023). The latest developments in AI-supported

language models allow individuals to communicate written and verbally with real-time feedback and support them improve language and professional skills (Chen, 2024). Such capabilities promote democracy in academic and corporate environments for those who seek equal development opportunities. AI, also, supports interdisciplinary competency development by integrating resources from different areas. For instance, AI systems can offer interdisciplinary learning ways which combine technical and social sciences, and prepare individuals for versatile roles in today's dynamic environments (Babashahi et al., 2024). From all these perspectives, AI contributes to competency development by providing adaptable, cooperative and effective learning solutions which prepare individuals for modern-day challenges.

3.2. Negative Effects of AI on Intrinsic Motivation

While AI offers important benefits, it causes challenges for intrinsic motivation. Over-trusting in AI tools can create a comfort zone that dissuades individuals from active engagement in problem-solving and critical thinking. For instance, overreliance on AI-produced solutions can decrease the sense of struggling with challenging tasks by destroying an individual's self-competency (Chen, 2024). In addition, AI-supported personalised learning environments may lead individuals to an unreal expertise illusion. As a result of this, learners can perceive themselves as more competent than real and so the intrinsic desire to develop themselves can be decreased. This dynamic can cause apathy in competency development and depression (Babashahi et al., 2024).

Furthermore, when AI automatises feedback and decision-making, it brings inefficiency risks to human mentorship and guidance. Lack of human interaction can cause a feeling of lost in learners and it harms human motivation and engagement (Xiao et al., 2024). To address these challenges, AI systems should be designed to promote active engagement and push users to apply the information independently before directly trusting in the automatic support (Mady & Niese, 2022). Also, hybrid learning models combining the training activities of both AI and human leadership can provide a balance between technological efficiency and personally designed mentorship.

3.3. Psychological Effects of AI

AI is able to affect psychological well-being by affecting autonomy, competency and cognitive flexibility. If the autonomous decision-making tools are over-prescriptive, it can weaken the sense of control of individuals which may lead to decreased satisfaction and engagement (Chen, 2024). In this context, while feedback methodologies of AI systems increase the sense of trust, over-trusting in automatic assessments can strip away the learners from the opportunities to experiencing real progress in their expertise areas. Such reliance may result in destruction of an individual's long-term competency development (Xiao et al., 2024). Also, AI systems designed to offer structured and predictable solutions can prevent creative and out of the box thinking. Such rigidity can limit specific abilities which have a significant place in today's dynamics on skills for individuals to adopt in novel and complex scenarios (Fulmer & Zhai, 2024).

Promoting human-AI cooperation via human-centric designs and flexible systems can overcome such psychological effects and support multifaceted competency development (Mena-Guacas et al., 2023). Also, adding experimental feedback methods into AI-based learning environments can support learners to internalise progress and adapt to challenges effectively.

3.4. Inferences on Skill Gaps

AI dramatically affects the skill gaps by redefining basic competencies like decision-making, critical thinking and flexibility. Automatic systems can decrease the need to deeply deal with analytical tasks for individuals by simplifying complex processes (Babashahi et al., 2024). In this respect, over-trusting in and overuse of insights generated by AI can prevent the capacity of individuals to question possibilities and explore alternative solutions (Mady & Niese, 2022). Also, the comfort provided by AI-based tools can weaken the potential capacity to struggle with daily challenges and manage those challenges effectively (Xiao et al., 2024)

The effect of AI on skill gaps extends over from accessing the development opportunities to equalities. Individuals from communities with opportunity limitations can face barriers to accessing AI-based tools and this can worsen the inequalities (Chen, 2024). To address eliminating those inequalities, policymakers and organizations should prioritise the fair distribution of AI resources and provide affordable developmental opportunities. In addition, AI systems should be integrated into human-centric frameworks which emphasise independent problem-solving

and reflecting practices. Development programmes should compel the users' competencies and include opportunities to engage the practical and real-world scenarios that promote individual growth (Mady & Niese, 2022). As a result, even though AI has significant potential to transform competency development positively, it also has challenges that need to be considered from a reflective and practical perspective. Stakeholders can optimise its effect on skill development by balancing AI's advantages on active learning and critical thinking with promoting strategies.

4. RECOMMENDATIONS

4.1. Integrative Approaches to AI in Competency Development

Positioning AI as a supportive tool instead of a substitute has critical importance in optimising the effect of competency development. AI must be a subsidiary tool for human efforts, develop cognitive and practical skills, but still not be replaced all. AI systems can be designed to work with professionals and decision-making processes can be undertaken by humans while AI provides real-time data analysis and insights. This incorporator approach enables the protection of critical thinking and reasoning and also the development of them (Chen, 2024).

Training institutions and workplaces can adopt hybrid learning models which combine AI tools and traditional learning methods. Such kinds of models benefit from the efficiency of AI's content creation types by promoting a balanced learning environment while human leadership and mentorship continue (Mady & Niese,

2022). Also, user-centric AI design principles in which learners have control over AI-based learning types ensure individuals actively participate in the competency development journey (Mena-Guacas et al., 2023).

4.2. Promotion of Intrinsic Motivation

Maintaining autonomy and engagement in AI-based environments requires goal-focused strategies. One of the most effective approaches is to integrate gamefied learning components in AI platforms. Features like challenges, rewards and progress monitorisation can make learning more interesting and they can encourage individuals to follow their goals actively instead of trusting in AI passively (Xiao et al., 2024).

Promoting autonomy consists of designing AI systems which offer options and adaptability in learning experiences to users. From this perspective, a feature that allows learners to identify their own goals, choose the learning style they prefer and access various resources can be added to AI-based learning platforms. Such flexibility not only protects autonomy but also increases motivation by adapting self-choices with learning experiences (Chen, 2024). Also, AI features based on promoting peer interaction can maintain engagement as it is a community. Discussion forums, team projects and AI-supported peer feedback systems contend with the potential sense of isolation in AI-based environments by ensuring human interaction is the basic part of the learning process (Mena-Guacas et al.,2023).

4.3. Balancing the Agility and Competency

Holistic skill development in AI-based environments requires a balanced framework which prioritises both agility and competency. Rapid technological changes require adaptability, but it should not be at risk of developing basic competencies like critical thinking, flexibility and reasoning (Babashahi et al. 2024). Organizations can adopt competency frameworks which combine permanent competencies with agility-focused competencies like problem-solving and digital literacy to ensure the balance. Development programmes should include scenario-based learning methods in which participants discuss complex and real-world issues that require both agility and critical thinking (Chen, 2024). Interdisciplinary approaches that combine technical skills with emotional intelligence and cultural characteristics are also critical. For example, AI applications used in global workplaces should include intercultural training programmes to prepare individuals for various cooperative initiations (Xiao et al., 2024).

Promoting a continuous learning culture is required to protect the balance. AI needs to be positioned as a life-long learning provider with systems offering personalised suggestions for skill development or redevelopment based on industry trends (Mady & Niese, 2022). Such an approach ensures individuals equip themselves with agility and competence in adapting to future challenges.

CONCLUSION

AI came out as a transformer in competency development. It reshaped the development approaches and professional paradigms. While it results in enabling the promotion of personalising learning and interdisciplinary cooperation, it also has challenging results such as decreasing intrinsic motivation and widening skill gaps. Adaptable learning platforms, real-time feedback mechanisms and the capacity to democratise the learning opportunities of AI redefined how individuals gain skills. AI tools enable learners to reach their learning goals more effectively by offering personalised experiences which meet their different learning needs.

Despite those benefits, AI's transformative strength also brings challenges. Overreliance on AI systems can cause a decrease in the critical thinking and problem-solving competencies of individuals. Also, the illusion of expertise promoted by AI-based platforms may blind the long-term development capacity and intrinsic motivation. In addition, inequalities in accessing AI technologies worsen development inequalities and turn disadvantaged groups more disadvantageous.

From this perspective, a balanced and incorporating approach should be applied to benefit from AI's potential to eliminate the disadvantages. Policymakers, trainers and industry leaders should cooperate to design systems promoting active learning and critical participation. Hybrid models combining AI-resulted efficiency and human mentorship may protect the basic factors of traditional development models while increasing adaptability. Also,

promoting a lifelong learning culture has significant importance due to rapid technological developments. AI systems should support continuous competence development by offering personalised suggestions to enable upskilling aligned with the developing industry demands. In addition, understanding the psychological effects of AI on autonomy and cognitive flexibility requires human-centric designs promoting reflecting practices and empowering users.

From all these perspectives, it is considered AI offers unique opportunities for competence development, but it needs to be taken into consideration carefully. Stakeholders may uncover completely AI's sustainable transformative potential on learning and professional development by prioritising equality, promoting intrinsic motivation and emphasising holistic competence development.

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