Balancing Efficiency and Dependency: The Impact of AI Tools on Employee Skills and Emotional Engagement

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Abstract: This study focuses on the dual impact of the use of AI tools in the workplace on employees' skills and emotions. It explores the degradation of skills and emotional connection caused by over-reliance on AI tools while enhancing employees' work efficiency. Through the literature research method, we constructed a model of Skill Complementarity - Emotional Connection to explore the dual impact of the use of AI tools on employees and the dynamic feedback mechanism. It is found that although AI tools can improve the processing efficiency of complex tasks, excessive use of AI tools can weaken employees' autonomy and lead to negative impacts. Therefore, companies should provide differentiated training according to different employee groups, establish a dynamic assessment mechanism to adjust the degree of intervention of AI tools, and improve employees' acceptance of AI tools through training to avoid the potential risks associated with their over-reliance on AI tools.

1 INTRODUCTION

Artificial Intelligence has become a necessary tool to help human beings improve productivity in modern society, and with the emergence of various types of AI tools, some of the employees have begun to worry about whether AI will lead to unemployment of human beings. As a matter of fact, human resources are still the most important resource in enterprises in today's society, but in the context of increased competition in contemporary society, human beings must follow the trend of the times and dare to adopt more flexible and innovative productivity tools, and combine and apply AI tools with human resources, in order to promote the iteration of technology and advance social progress and development.

Although there are already colleges and universities combining AI with other majors to derive composite majors, the existing AI applications are still in the primary stage, and some studies have concluded that AI is accompanied by a series of negative psychological problems while bringing about an increase in the ability of employees (Shi & Liu, 2025). Therefore, management needs to pay attention to the impact of timely AI tools on employees in terms of emotional connection, and HR should help employees use AI tools reasonably. At the same time as the use of AI for employees to bring more convenient and efficient help to reduce cognitive load to improve the quality of life and work efficiency at the same time, employees on the AI tools to produce a sense of dependence on the employee's future development will also cause a series of impacts (Zhang & Shen, 2024).

The public generally believes that AI can enhance human skills, but dependence on AI tools may lead to skill degradation. To maximize the positive impact of AI tools in an organization, they should be used strategically to complement human abilities, with clear guidelines and training provided to employees on how to leverage AI effectively while maintaining and developing their own core competencies. In the era of AI, exploring these questions cannot only help corporate managers or human resources practitioners to improve their human resources management, training and development capabilities, but also allow employees to re-examine this special relationship, adjust unreasonable usage, and avoid emotional ties that may lead to unhealthy development. This study is based on an extensive review of domestic and international literature on AI tools.

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2 LITERATURE REVIEW

2.1 Current Status

With the rapid development of artificial intelligence technology, AI tools are increasingly applied in the workplace. Their use in organizations evolves through three stages: technology embedding, process reconstruction, and value creation. AI is transforming employees' work methods and workflows, from human resource management to daily office tasks. For example, the application of AI technology in the recruitment process has become very common, through natural language processing and machine learning, AI can quickly screen resumes, identify potential candidates, and conduct preliminary interviews, thus significantly improving recruitment efficiency (Hmoud & Laszlo, 2019). At the strategic level it is even able to construct employee competency growth curves through deep learning-driven predictive analytics systems, increasing the accuracy of talent retention decisions by 28.6%. Meanwhile for other industry sectors it is worth noting that the application of AI tools shows significant industry heterogeneity: the financial industry focuses on risk prediction models, while the manufacturing industry focuses on IoT-driven device co-optimization. Meanwhile, AI tools are not limited to recruitment but also play an important role in training and employee development. With personalized training modules and real-time feedback, AI can help employees improve their skills and adapt to changing work environments. AI is also increasingly used in performance management today, where through data analysis and predictive modelling, AI can provide more accurate performance appraisals and help employees improve their performance.

However, existing research still has some limitations. Based on research related to various aspects of business, some studies can tend to be technologically deterministic, with Tiwari noting that 78% of the literature overestimates the technological efficacy of AI tools and ignores the rigid constraints of organizational practices. For example, small and medium-sized manufacturing enterprises have a 23.7% misjudgment rate of AI quality control systems due to the lack of standardized processes (Tiwari et al., 2021). At the same time, existing evaluations mostly use unidimensional efficiency indicators (e.g., man-hour compression rate), ignoring hidden values such as knowledge spillover effects.

Meanwhile, the update of AI tools also has some impact on the research results, Zhang, J. found that the performance leap of ChatGPT from version 3.5 to 4.0 led to the extension of the average adaptation cycle of employees to 4.2 months, which incurred a significant skill replacement cost. Nowadays, when AI updates are very fast and iterative, the impact of model updates on various aspects cannot be ignored.

2.2 AI Tools

It has been shown that AI tools have significant effects in enhancing employee skills. For example, by using AI-driven training platforms, employees can learn new skills more efficiently, reduce learning time, and improve learning outcomes (Singh & Shaurya, 2021). AI tools can also help employees better master complex tasks by simulating real-life work scenarios and providing practice opportunities (Qamar et al., 2021).

However, the use of AI tools also brings some negative psychological problems. For example, employees may feel less autonomous and have concerns about skill degradation due to over-reliance on AI tools. In addition, the use of AI tools may trigger anxiety and stress in employees, especially if the feedback from AI tools is not clear or fair enough. Empirical studies show that AI-assisted software engineers have significant improvements in code quality and development efficiency, but there is an obvious ability compensation gradient effect: the benefit rate of junior employees is significantly higher than that of senior employees, which reflects the barriers to the absorption of new technologies in the existing knowledge system.

2.3 Impact of AI Tools

The use of AI tools in the workplace not only affects employees' skill improvement but also has a profound impact on their emotional connection. Research has shown that employees' emotional connection to AI tools may affect their job satisfaction and work engagement. For example, when employees feel that AI tools provide support and assistance, they are more likely to have a positive affective connection to the AI tool, which leads to increased job satisfaction (Tang et al., 2022). Emotional connection research presents a dialectical relationship of technological empowerment-psychological depletion. In the positive dimension, AI tools enhance the stickiness of using them through emotional design (e.g.,

anthropomorphic interaction interface), and increase the job satisfaction of telecommuting employees. Particularly in high-pressure work scenarios, intelligent stress management systems have led to a significant increase in team cohesion index through real-time emotion recognition and intervention (Qamar et al., 2021).

However, the implicit expansion of algorithmic power is triggering a systemic crisis in the organizational emotional ecosystem: nearly half of employee's report that AI performance monitoring has led them to experience the Panopticon Effect. Algorithmic bias may even trigger a crisis of perceived fairness - one multinational company's AI recruitment system reduced female hiring by 12.4% due to gender discrimination, leading to a 19.3% drop in employee commitment (Vrontis et al., 2022). In addition, employees' dependence on and excessive trust in AI tools can also have an impact on their subsequent career development.

All in all, over-reliance on AI tools may lead to excessive emotional connection of employees, affecting their autonomy and creativity. When AI tools play an overly important role in decision-making, employees may rely less on their own judgement, leading to reduced decision-making ability. In addition, incorrect or unfair feedback from AI tools may trigger negative emotions in employees, reducing job satisfaction and work engagement.

2.4 Shortcomings of Current Research

Although existing studies have made some progress in the area of AI tools on employees' skill enhancement and emotional connection, there are still some shortcomings. Firstly, most studies have focused on the short-term impact of AI tools, while fewer studies have examined the long-term impact. Whether the long-term use of AI tools will lead to a sustained improvement in employee skills or trigger a more serious degradation of skills still requires further research.

Second, existing studies have less research on the impact of AI tools in different cultural and organizational contexts. Different cultural and organizational contexts may have a significant impact on the acceptance and usage of AI tools, thus affecting their skill enhancement and emotional connection effects on employees. Managers need to pay attention to the mental health and skill development of their employees to ensure that the use of AI tools truly promotes employee growth and organizational development rather than leading employees astray.

3 ANALYSIS

3.1 The Implementations

Compared with the systematic literature review that relies on a predefined framework of questions, this method chooses a more open research paradigm that avoids the limitations of quantitative tools and meets the needs of exploratory theoretical research.

3.1.1 Literature Search and Screening

Taking EBSCO, Web of Science, CNKI and other databases as the core, using keywords such as AI tool use, employee skills, emotional connection and other keyword combinations in Chinese and English, we screened journal articles, monographs and industry reports published in the fields of management and psychology during 2018-2024, focusing on the inclusion of SSCI/CSSCI source literature.

3.1.2 Theoretical Framework Construction

In terms of theoretical framework construction, this study is based on the MRD structure, which is methodology, results and discussion, which integrates two major theoretical axes. The first is the theory of skill complementarity, which draws on the three-quadrant model of human-computer ability complementarity proposed by Man Tang et al. to deeply analyze the skill compensation mechanism achieved by AI tools through task offloading, decision-making enhancement and cognitive expansion. The second is the emotional connection theory, which combines the cognitive dependency of AI proposed by Zhang and Shen to reveal the dynamic evolution path of emotional response. Through the theoretical coupling, we construct the Skill Complementation and Emotional Connection analysis matrix, forming a multi-dimensional explanation framework, which provides a solid theoretical foundation for the in-depth analysis of the impact of AI tools on employees' skills and emotions.

3.1.3 Critical Analysis

Contradiction analysis is used to deconstruct opposing views in literature. For example, in terms of the paradox of efficiency gain and alienation, Qamar

et al. confirm the efficiency gain of AI in recruitment, while Shi and Liu reveal that over-reliance on AI leads to an increase in the incidence of ethical excuses, in terms of the gradient effect of skill compensation, Man Tang et al. find that the rate of skill enhancement for junior employees is significantly higher than that for senior employees, which is attributed to the difference between knowledge inertia and technology absorption, in terms of the two-way regulation of affective connection's bidirectional moderation, some scholars noted that employees in collectivist cultures are more tolerant of AI monitoring, but did not quantify the moderating effect of the power distance index (PDI). These comparisons reveal the core research blind spot: the absence of an interaction mechanism between skill compensation and affective alienation.

3.2 Theoretical Research

Existing studies do not have a combined analysis of skill complementarity and affective connection aspects generated using AI tools on employees. Current research mostly explores the single impact of AI tools on employees' skills or emotions in isolation, failing to reveal the dynamic interaction mechanism between the two. Skill complementarity theory emphasizes that AI improves efficiency through task division but ignores the inhibitory effect of the emotional connection between employees and AI tools on employee skill transformation. For example, although AI-assisted programming improves code output, the black-boxing of algorithms may weaken developers' understanding of technical principles, leading to the skill compensation illusion. Meanwhile, the effective connection theory focuses on anxiety but fails to explain how affective fluctuations can be counteracted in skill acquisition. It is worth considering how to utilize the relationship between affective connection and complementary skills to train and assist employees. The potential cause is a lack of interdisciplinary dialogue due to disciplinary barriers leading to theoretical fragmentation, with management favoring efficiency analysis and psychology focusing on emotional mechanisms.

The limitations of the current research methodology are mainly due to insufficient empirical evidence for longitudinal tracking and cross-cultural comparisons. Current research relies on cross-sectional data and lacks tracking of the long-term impact of AI tools. Qamar et al. validated the immediate effects of AI training but did not assess whether employees' ability to iterate their skills would decline after 3 years because of AI dependency. Cross-cultural comparative studies are similarly scarce, with employees in collectivist cultures more likely to embrace AI tools but failing to quantify the moderating effect of different cultural dimensions on technology adoption thresholds.

Initial speculation was that longitudinal studies were costly and time-consuming due to academics' preference for short-term results. Cross-country data access was limited by corporate confidentiality agreements and cultural sensitivities, leading to homogenized samples (more than 80% of the market is between Europe, the US and China) (Vrontis et al., 2022). Methodologically, existing scales (e.g., the Technology Anxiety Scale) have not been adapted to the characteristics of different AI tools and their validity is questionable.

3.3 Practical Disconnect

There is a synergistic imbalance between the help of AI tools to organizations and the presence of ethical constraints on employees. There is a general tendency to emphasize technology over management in enterprise practice, and many enterprises do not carry out human-computer collaboration training after introducing AI tools, resulting in employees' anxiety due to the skills gap. This shows that when enterprises invest in technology, they often neglect supporting management measures, such as training and skills upgrading programs, thus affecting the ability of employees to adapt to new technologies.

In terms of ethical governance, the correction of algorithmic bias also remains at the technological level, lacking a synergistic framework of technology-institution-culture. Shi and Liu's study found that the incidence of employees' moral excuses was 37% higher in enterprises that did not have an ethical review mechanism in place (Shi & Liu, 2025). This highlights the fact that it is not enough for enterprises to rely only on technological means to correct algorithmic bias in the process of technology application and that they also need to build a comprehensive ethical governance framework at the institutional and cultural levels to reduce the ethical risks in the application of technology.

4 RESULTS

By integrating the existing literature, this study found that the application of AI tools in the workplace presents a complex bidirectional dynamic relationship between employees' skills and emotions. In terms of skill complementarity, AI tools significantly improve employees' efficiency in handling complex tasks through task decomposition and cognitive support. Junior employees can quickly master standardized operations assisted by the tools, but long-term over-reliance may lead to the gradual degradation of core skills. For example, when the degree of AI intervention exceeds a certain threshold, the ability of employees to solve problems on their own may be implicitly weakened, forming a tool substitution trap - behind the surface of the efficiency improvement, it is the loss of innovative thinking and depth of technical understanding.

At the level of emotional connection, the interaction design of AI tools directly affects the psychological state of employees. Transparent and explainable feedback mechanisms (e.g., clear progress reminders and decision-making basis) can enhance employees' trust in the tool, thus establishing positive emotional dependence. On the contrary, black-boxing or excessive monitoring of algorithms can easily trigger anxiety and alienation and even trigger resistance to technological control. It is worth noting that employees with different skill levels respond differently to affective stimuli: high-skilled employees are more concerned about the limitations of AI tools on professional autonomy, while low-skilled employees may be caught in a cycle of passive adaptation due to increased tool dependency.

Analyzed in conjunction with the model diagram (Skill Complementarity-Emotional Connection Model), it was found that the two do not act in isolation but form dynamic feedback through self-efficacy. When employees accumulate successful experiences with the help of AI, their self-efficacy will further stimulate their willingness to learn actively, forming a positive cycle of skill enhancement and confidence reinforcement. On the other hand, if the use of tools weakens employees' perceptions of their own abilities, it will lead to a vicious interaction of increased anxiety and skill stagnation. As shown in Figure 1, this mechanism manifests itself differently in different organizational environments: hierarchical organizations are more receptive to AI monitoring, but employees become emotionally drained faster, whereas in flat teams, the flexibility of tool use may mitigate emotional conflict, but there is a risk of homogenization of skills.

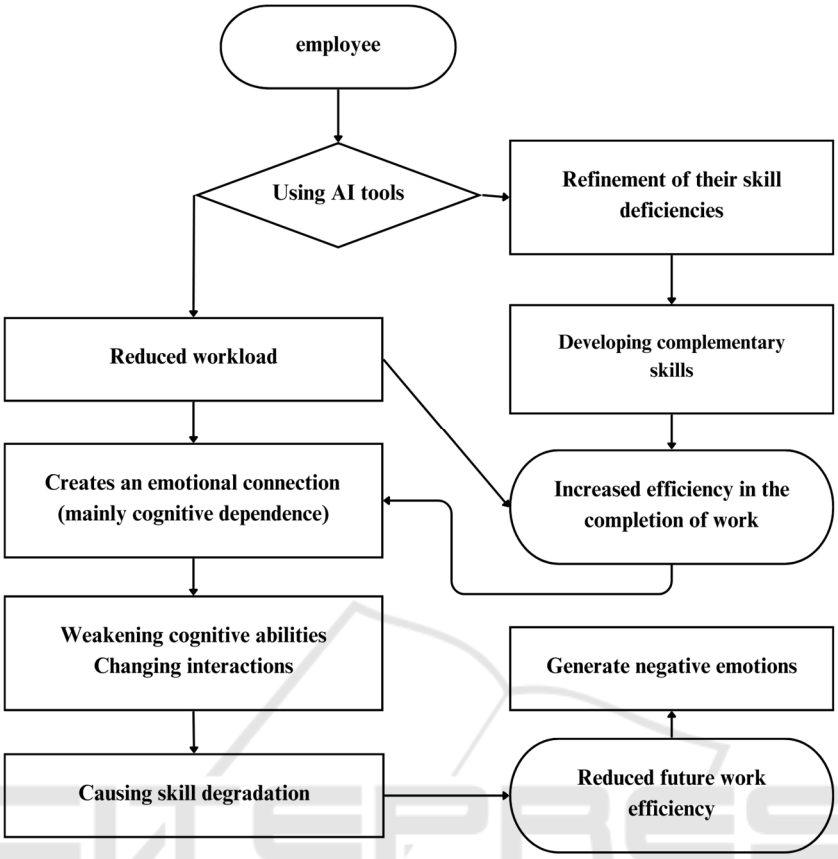
5 DISCUSSION

After logically analyzing and extrapolating the literature in related fields, this paper focuses on two major academic sections, psychology and management, and examines the use of AI tools in today's hot topic of exploration, drawing relevant conclusions about the ability to assist in human resource management.

5.1 Main Findings

The core finding of this study reveals that the use of AI tools in the workplace brings positive as well as negative impacts to employees, which can be reduced by managers through training: while enhancing employees' skills, AI tools may trigger a complex evolution of emotional connections. The main finding suggests that AI tools significantly increase employees' efficiency in handling complex tasks through a skill complementation mechanism, but this efficiency gain comes with a potential risk - when AI tools are used beyond a reasonable threshold, employees' reduced autonomy will lead to a degradation of their skills and trigger negative affective associations. This finding validates the tension between perceived usefulness and perceived risk in the Technology Acceptance Model (TAM). This suggests that the realization of the value of AI tools needs to be based on a dynamic equilibrium.

Secondly, due to inter-individual differences (the acceptance of AI tools by highly ethically sensitive employees was significantly lower than that of the general group, which stemmed from their higher demand for their own task completion and higher sense of ethical standards 0. This result challenges the assumption of established research that technology acceptance is solely attributed to tool effectiveness, and the author analyses the need for organizations to establish a differentiated training system, such as designing pre-training courses such as psychological counselling for employees with high ethical senses before conducting formal AI operation courses (defining employees' adaptability to the use of AI tools can be done by designing measurement questionnaires to categorize the groups.



Alt Text for Figure: Steps towards achieving complementary skills and emotional connection of employees using AI tools for employees in organizations.

Figure 1: Skills Complementarity-Emotional Connection Model Diagram.

5.2 Theoretical Breakthroughs

Existing research has long been fragmented by disciplinary perspectives - management scholars focus on technology effectiveness and productivity improvement, while psychologists focus on mood swings and mental health, resulting in a fragmented explanation of the skill-emotion interaction mechanism. The theory of skill complementarity emphasizes that AI tools optimize efficiency through task division, yet it does not reveal the inhibitory effect of emotional depletion on skill transformation; the study of affective connection portrays the path of anxiety generation but overlooks the moderating effect of skill level on affective response (Morandini et al., 2023). This split essentially stems from methodological differences: quantitative studies prefer measurable efficiency indicators, while qualitative studies are more concerned with in-depth descriptions of subjective experiences.

By integrating complementarity theory and affective connection theory, this study constructed the Skills Complementarity Model, which realizes three levels of theoretical innovation. Firstly, From the perspective of dynamic interaction, the study reveals that skill enhancement and emotional depletion are not independent processes but form a feedback loop through self-efficacy. Skill degradation can erode employees' confidence in their own abilities, which in turn increases technical anxiety, which in turn inhibits the active acquisition of new skills. Secondly, expanding on the ethical dimension to include the impact of emotional connection on employees' behaviors using AI tools in employee training and development considerations, concluding that classifying different employees before training will increase employees' acceptance of AI tool use and reduce cognitive dependence and negative emotions caused by inappropriate AI use. Lastly, constructing an interdisciplinary explanatory framework that combines the emotional connection between AI and human beings studied in the field of psychology with

the impact of AI tools on the skill aspects mastered by employees studied in the field of management from the perspective of the discipline of human resources, to point out the direction for organizations to train their employees related to the use of AI (Azeem et al., 2024).

5.3 Theoretical and Practical Extensions

The core value of this study is that it breaks through the interpretative limitations of a single discipline and provides an integrative analytical framework for human-computer collaborative management in the digital workplace. At the theoretical level, the proposed model bridges the gap in existing literature on the skill-emotion interaction mechanism and provides a testable hypothesis system for subsequent research. At the practical level, the findings of the study provide a threefold message to business managers (Krishnan et al., 2024). Organizations should consider the boundaries of using AI tools in work tasks, establish a dynamic evaluation mechanism, and adjust the degree of AI intervention according to the complexity of the task and the ability level of the employee, to avoid the degradation of skills caused by over-reliance on AI tools. The enterprise needs to have an emotional support system, incorporate AI ethics training into the regular management system, enhance employees' awareness of the limitations of the technology through workshops, case studies and other forms, and reduce the trust crisis caused by algorithmic errors (Natarajan & Gombolay, 2020). Organizations can differentiate their capacity building by designing a technical-psychological dual-track training program for highly ethically sensitive employees, which enhances their critical examination of algorithmic decision-making while improving their tool operating skills.

5.4 Research Limitations and Future Directions

Due to the limitations of secondary data and data acquisition methods, this study was unable to track the cumulative effects of long-term AI tool use on employees' career development. For example, skill degradation may exhibit progressive characteristics, the tipping point of which is difficult to capture through cross-sectional data. In addition, the samples mainly come from technology-intensive industries that have been well studied in literature, and the interaction patterns between AI tools and employee competencies in traditional industries (e.g., manufacturing, education) remain to be explored (Yang & Yan, 2024).

Future research can be deepened in three directions: first, adopting a mixed research methodology to reveal the trajectory of skill evolution through tracking experiments and in-depth interviews. Second, conducting cross-cultural comparisons to test the mitigating effect of organizational training on the emergence of employees' technological anxiety across different cultures, and third, focusing on the impact of generative AI (e.g., big language models) knowledge workers, especially the relationship between technological dependency and creativity's paradoxical relationship (Fang et al., 2024).

6 CONCLUSION

The widespread use of AI tools in the workplace opens new paths for employee skill enhancement but also brings potential risks of emotional detachment and capability degradation. This study systematically reveals the double-edged sword effect of AI tools: while significantly improving efficiency through task division and skill complementation, over-reliance will weaken employee autonomy, triggering skill degradation and negative emotional connection. Especially in the highly ethically sensitive group, concerns about the fairness of algorithms significantly reduce the acceptance of the technology, highlighting the critical impact of individual differences on the effectiveness of AI applications.AI tools can cause emotional bonding phenomena while improving the skills of employees, suggesting that the inappropriate use of AI tools can lead to skill degradation and re-establishment of negative affective bonding. Whereas the proper use of AI tools can greatly improve efficiency, highly ethical employees are less receptive to AI tools, so companies that need to use AI as aid in the modern era should provide different training for different groups of employees. Research shows that the efficiency of AI tools stems from their data processing and automation advantages, but the rapidity of technology iteration also forces employees to adapt frequently, resulting in hidden skill reset costs. In addition, the complexity of the emotional connection is reflected in the co-existence of tool dependence and psychological alienation - the lack of algorithmic transparency exacerbates employee

mistrust, while the imbalance of technological enablement may inhibit innovation. In conclusion, managers should pay attention to employee psychology, conduct regular sniffing or checking to ensure that employees are using AI tools correctly, and continually train employees in line with organizational goals.

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