Contents lists available at Science-Gate

International Journal of Advanced and Applied Sciences

Journal homepage: http://www.science-gate.com/IJAAS.html

The effect of achievement needs on employees' open innovation: A knowledge inertia perspective

Qinglong Zhang [1], Yaoping Liu [2,*], Junaidi Junaidi [1,3]

[1]*Department of Management Science, Institute of Science Innovation and Culture, Rajamangala University of Technology, Bangkok 10120, Thailand*
[2]*Institute of Science Innovation and Culture, Rajamangala University of Technology, Bangkok 10120, Thailand*
[3]*Department of Accounting, Universitas Muhammadiyah Palopo, Sulawesi Selatan, Indonesia*

ARTICLE INFO

Article history:
Received 27 May 2025
Received in revised form
6 October 2025
Accepted 23 October 2025

Keywords:
Knowledge inertia
Achievement needs
Open innovation
Employee motivation
Organizational sustainability

ABSTRACT

This study investigates how entrepreneurial traits and innovative behavior influence employees' knowledge inertia, and examines the mediating role of knowledge inertia between employees' achievement needs and open innovation. Data were collected from 581 middle-level executives in Chinese companies using random sampling, and the research model was tested with Structural Equation Modelling (SEM). The findings reveal that employees' achievement needs have a positive and significant effect on experience- and learning-related knowledge inertia, while knowledge inertia partially mediates the relationship between achievement needs and open innovation. The results also show that employees' motivation, commitment, and skills play a key role in fostering new ideas, innovation, and organizational advocacy. Furthermore, reciprocal communication and feedback-friendly channels are important for strengthening innovation practices. The study suggests that companies should not only focus on improving performance and profitability but also provide opportunities for employee development and involvement in sustainability initiatives. These insights offer practical guidance for firms seeking to enhance innovation and ensure long-term organizational sustainability.

1. Introduction

Entrepreneurship is a key driver of economic development, serving as a vital indicator of a country's growth (Awwad, 2024; Koseoglu and Arici, 2025). In the early 21st century, this significance spurred extensive research (Wechtler and Suseno, 2024). Scholars have identified entrepreneurship as a multivariate concept, suggesting that different interpretations can lead to varied propositions, meanings, and research directions (Al Mamun et al., 2025; Junaidi et al., 2025). This complexity underscores the heterogeneous nature of entrepreneurship and its critical role in human resource development. While entrepreneurship often begins with the psychological traits of entrepreneurs, these assertions have faced ongoing scrutiny (Zan et al., 2024). Consequently, organizations must leverage employees with strong personality traits to facilitate knowledge transfer and integration, thereby enhancing corporate innovation, a significant management challenge (Rammal et al., 2023).

Open innovation and overcoming knowledge inertia are creating a culture that promotes adaptability and collaboration, while addressing entrenched mindsets has become a global challenge in fostering knowledge sharing among employees. Knowledge inertia, characterized by a reliance on established practices and resistance to new ideas, can severely limit an organization's capacity for open innovation (Nawaz et al., 2024). This inertia often arises from fears of change and a lack of leadership support. Some organizations struggle to balance traditional operational practices with the need for innovation in a rapidly changing market. Employees may hesitate to collaborate with external partners or adopt new technologies, which can stifle creativity and hinder the flow of ideas, ultimately affecting competitiveness. Additionally, varying cultural attitudes toward risk and change can intensify knowledge inertia, complicating the implementation of effective open innovation strategies.

* Corresponding Author.
Email Address: yaoping.l@mail.rmutk.ac.th (Y. Liu)
https://doi.org/10.21833/ijaas.2025.11.013
Corresponding author's ORCID profile:
https://orcid.org/0000-0001-5712-6868

Some studies emphasize the importance of cultivating an innovative culture to enhance overall performance. For instance, Liu et al. (2025) and Zhong et al. (2024) found that employees with strong entrepreneurial traits are more likely to engage in innovative activities, although this engagement is moderated by knowledge inertia. Some employees resistant to change due to entrenched practices are less likely to transform entrepreneurial traits into effective innovation behavior. It demonstrates that knowledge inertia is essential for organizations to fully harness the potential of entrepreneurial employees. Similarly, Arsanti et al. (2024) and Shi et al. (2021) highlighted that organizations fostering a culture of risk-taking and experimentation experienced reduced knowledge inertia, leading to increased collaboration with external partners. This collaboration not only enhanced innovation outcomes but also improved employee performance towards fostering a sense of ownership and the innovation process. Furthermore, Tsai et al. (2020) and Zhang et al. (2024) emphasized the role of training and development in mitigating knowledge inertia, showing that continuous learning opportunities enable employees to embrace new ideas and practices to enhance employees' innovation behavior and performance.

Prior studies focus on specific industries and often neglect traditional manufacturing sectors where knowledge inertia and innovation dynamics may differ significantly. This highlights the need for cross-industry research to provide a more comprehensive understanding of these relationships. Additionally, existing research frequently emphasizes qualitative methods, potentially overlooking the nuanced quantitative aspects of employee experiences and behaviors. Understanding these dynamics over time could yield critical insights into how organizations can effectively foster innovation. Lastly, while some studies address the role of leadership and organizational culture, there is insufficient exploration of how external factors, such as entrepreneurial traits and behavioral intentions, influence knowledge inertia and subsequently facilitate employees' open innovation.

2. Literature review and hypothesis development

2.1. Organization learning theory

Organizational Learning Theory (OLT) provides a valuable outline for considering the dynamics of knowledge inertia and its impact on open innovation (Liao et al., 2008). OLT posits that organizations learn and adapt through the achievement, sharing, and submission of knowledge. This theory emphasizes the importance of creating a learning environment that fosters continuous improvement and innovation (Han and Ni, 2025; Lam et al., 2021). It can uncover the underlying mechanisms that contribute to employees' resistance to change and their engagement in open innovation. Knowledge inertia often manifests as a reliance on single-loop learning, where employees stick to familiar routines and resist exploring new ideas. OLT also establishes the role of organizational culture in shaping learning behaviors. A culture that values experimentation, risk-taking, and exposed statements is more likely to foster an atmosphere conducive to innovation among employees. Furthermore, the company can identify barriers to learning and innovation, enabling them to implement strategies that promote a more adaptive and open mindset among employees (Haile and Tüzüner, 2022). Employees can challenge current knowledge and create new solutions when they are encouraged to share their experiences and insights. Hence, organizations must set up systems that promote information exchange, like cross-functional teams, collaborative platforms, and frequent brainstorming sessions, to solve this problem (Fig. 1).

2.2. Entrepreneurial trait

Entrepreneurial traits refer to the inherent characteristics and qualities that individuals possess, which predispose them to engage in entrepreneurial activities such as risk-taking, proactiveness, innovativeness, resilience, and self-efficacy (Awwad and Al-Aseer, 2021; Troise and Tani, 2021). These traits often include qualities such as risk-taking, resilience, creativity, adaptability, and a strong internal drive. Entrepreneurs typically possess a vision for identifying opportunities and are willing to take calculated risks to pursue their goals (Shabbir, 2025). The correlation between entrepreneurial traits and business success is significant. Entrepreneurs with strong traits are more likely to innovate, adapt to changing market conditions, and effectively solve problems, which are crucial for sustaining competitive advantage. Creativity enables entrepreneurs to develop unique products or services, while adaptability allows them to pivot their strategies in response to customer feedback or market trends. Entrepreneurial traits significantly influence experience inertia towards shaping how employees respond to established practices and knowledge within an organization (Kuvshinikov and Kuvshinikov, 2024). Entrepreneurs with strong traits such as adaptability and creativity are more likely to challenge the status quo and seek innovative solutions, thereby reducing the likelihood of experiencing inertia. An individual with a lack of entrepreneurial traits may exhibit a stronger tendency toward experiencing inertia, clinging to familiar routines, and established knowledge. This resistance can stifle innovation and hinder organizational growth. Therefore, fostering entrepreneurial traits within teams can mitigate experience inertia, promoting a dynamic environment that embraces change and encourages continuous learning.

H1: The entrepreneurial trait has a positive effect on employees' (a) experience inertia and (b) learning inertia.

2.3. Innovation behavior

Innovation behavior refers to the actions and practices that individuals or teams engage in to create, develop, and implement new ideas, products, or processes towards idea generation, experimentation, collaboration, and adaptation. Furthermore, innovation behavior plays an important role in influencing an individual's entrepreneurial traits, organizational culture, and external market conditions (Goldschmeding et al., 2024). Innovative employees disrupt established practices and processes and cause experience inertia by experimenting with new ideas, collaborating across teams, and actively seeking feedback to reduce knowledge inertia (Wechtler and Suseno, 2024). Employees are more receptive to trying out novel ideas and solutions when they are encouraged to use their imaginations and take measured risks (Imran et al., 2025). This proactive involvement creates a culture where people feel empowered to deviate from conventional procedures and learn from mistakes to obtain co-creation value. Furthermore, innovation encourages cooperation and knowledge exchange, both of which have the potential to further upend longstanding habits. Employees collectively contribute a range of perspectives and insights, challenging the assumptions that underlie experience inertia. Organizations that emphasize and foster innovative behavior will therefore probably see a reduction in experience inertia, which will improve their ability to adapt, solve problems, and, eventually, gain a competitive edge in a market that is changing quickly.

H2: The innovation behavior has a positive effect on employees' (a) experience inertia and (b) learning inertia.

2.4. Knowledge inertia

Employees' knowledge inertia can significantly influence their engagement in open innovation, often acting as a barrier to collaborative and creative processes essential for innovation (Arsanti et al., 2024; Jing et al., 2023). Knowledge inertia refers to the propensity of individuals to rely on established knowledge, routines, and practices to explore new ideas. This phenomenon can manifest in several ways that impact open innovation efforts (Jabeen et al., 2023; Lam et al., 2021). Employees who are entrenched in existing knowledge and practices may resist new ideas or external collaborations. Hence, organizations may miss out on valuable opportunities for innovation that arise from partnerships with external stakeholders. Furthermore, knowledge inertia can lead to a lack of creativity and problem-solving capabilities (Leso et al., 2023; Ma et al., 2023). Employees who are not encouraged to challenge their assumptions or explore alternative perspectives may struggle to generate innovative solutions. Furthermore, departments or teams may become separated in their methods and expertise due to knowledge inertia, which can result in silos inside businesses. The exchange of ideas and information required for open innovation projects to be effective may be hampered by this isolation. Lack of collaboration reduces the possibility of idea cross-pollination, which lowers the overall efficacy of innovation initiatives (Shabbir, 2025). Organizations can improve their open innovation capabilities by encouraging entrepreneurial qualities and giving staff members chances to interact with outside partners. In the end, overcoming knowledge stagnation is essential to developing a creative and adaptable staff that can prosper in a business environment that is changing quickly.

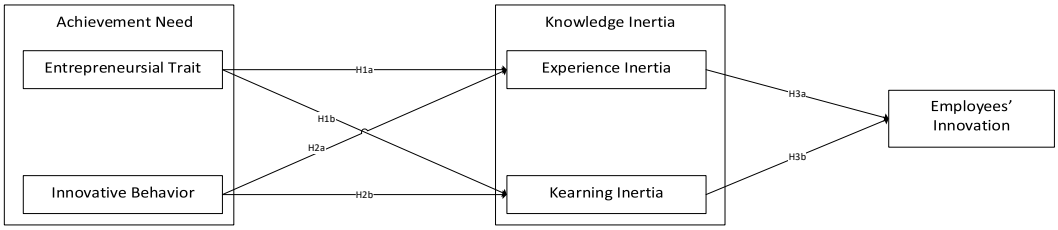
H3: The knowledge inertia (a) experience and (b) learning has a positive effect on employees' open innovation.

2.5. Knowledge inertia as mediator between employees' achievement need and open innovation

Employees' knowledge inertia can serve as a significant mediator in the relationship between entrepreneurial traits, innovation behavior, and open innovation (Tan et al., 2021). Fostering an innovative mentality requires entrepreneurial qualities like inventiveness, adaptability, and risk-taking. However, workers may find it difficult to convert these entrepreneurial qualities into productive innovation behavior and open innovation participation if they suffer from knowledge inertia, which is the tendency to rely on preexisting information and routines (Tsai et al., 2020; Wang et al., 2020). Employees with strong entrepreneurial traits are more likely to generate innovative ideas and seek out new opportunities. An employee may have the creativity to propose a novel solution but may hesitate to pursue it due to a reliance on traditional practices or fear of deviating from established norms. Knowledge inertia can limit collaboration and knowledge sharing, which are critical components of open innovation. Employees who are entrenched in existing knowledge may be less inclined to engage with external partners or embrace new perspectives. This reluctance can stifle the flow of ideas and insights necessary for successful open innovation initiatives. Employees' knowledge inertia mediates the relationship between entrepreneurial traits and innovation behavior, ultimately influencing their engagement in open innovation.

H4: Experience inertia has a positive and significant effect in mediating the relationship between employees' achievement need and open innovation.

H5: The learning inertia has a positive and significant effect in mediating the relationship between employees' achievement need and open innovation.



H4: Employees' achievement need – Experience Inertia - Employees' innovation
H5: Employees' achievement need – Learning Inertia - Employees' innovation

Fig. 1: Proposed research model

3. Methodology

3.1. Research design

The participants of this study are employees of middle-level executives in the cross-institution sector of China's high-tech industries. High-tech companies are more receptive to changes in the market environment and are focused on product development, technology, and innovation. The first stage is the sampling method employed in this study is stratified random sampling, which ensures adequate representation of specific subgroups within the middle-level executives. The participants are divided into four distinct management roles: marketing managers, product managers, quality control section chiefs, and R&D section chiefs. This study applied a pretest and a pilot test. The purpose of the pilot test was to ascertain whether participants understood each question and to revise the wording to avoid single-source bias (Podsakoff et al., 2003). An offline and online survey on social media was conducted from June 1 to August 30, 2024, as it is an effective method for addressing complex decision-making problems that require simultaneous consideration of multiple factors. A total of 627 participants completed the questionnaire, out of which 581 valid responses were obtained, resulting in a completion rate of 92.66%. Structural Equation Modeling (SEM) with AMOS and SPSS software was applied to examine the research hypothesis. Table 1 presents demographic information.

This study followed the prevention and post-detection procedures recommended by Podsakoff et al. (2003) to minimise the risk of common method variance (CMV). For post-detection, Harman's single-factor test and the common latent factor (CLF) technique were applied. The CLF was used because Harman's single-factor test alone has limitations in identifying CMV. The first factor accounted for 44.24% of the variance, which is below the 50% threshold. These results indicate that CMV is not a significant concern in this study. Therefore, the use of confirmatory factor analysis (CFA) and the subsequent hypothesis testing is justified.

3.2. Measurement

The employees' achievement needs were measured using a modified scale adapted from Khan et al. (2020). This scale is particularly relevant due to the cultural emphasis on success, hard work, and perseverance in the Chinese company's field. Employees with high achievement needs are characterized by their inclination to set ambitious goals, strive for perfection, and seek significant accomplishments. Employees with high achievement need to set higher goals, desire to do things more perfectly, and achieve greater success; they pursue the process of overcoming difficulties, solving problems, and struggling, and they have a strong desire to pursue success. Entrepreneurs have higher achievement. The need for achievement is the most critical personality trait of entrepreneurs. Knowledge inertia refers to Xie et al. (2016), which comprises five items: the employees' use of past knowledge and experience to solve new problems. Employees' open innovation adopted from Wang et al. (2020). The employees' open innovation behavior is the most important and fundamental trait of knowledge inertia, which refers to the adoption and implementation of ideas that are considered new by individuals or units (Burcharth et al., 2017; Zhang et al., 2022). The research instrument aligns with the traditional Chinese values of diligence and the Confucian work ethic, which prioritize personal and collective success.

4. Result

4.1. Measurement model

Table 2 shows the values of Cronbach's alpha. The confirmatory factor analysis (CFA) results showed that the data fit well with the model (Table 3).

4.2. Structural result

Fig. 2 shows that the fit of data to the proposed model was adequate (Hair et al., 2019). The positive relationship between entrepreneurial traits and employees' knowledge inertia (γ_{11} = 0.636, $p < 0.001$; γ_{21} = 0.641, $p < 0.001$), respectively supports H1a and H1b. Employees with high entrepreneurial traits possess stronger intrinsic motivation and a higher need for achievement, leading to proactive learning and, consequently, higher levels of innovative behavior. Therefore, employees who are more likely to actively challenge inertial behaviors within the organization are more inclined to support

change, thereby altering some inertial cultures within the organization. It is because employees with higher internal control personalities have higher affective and normative commitment to the organization, and the higher the organizational commitment, the higher the participation in organizational change, which also actively engages in organizational learning and reduces knowledge inertia. Furthermore, innovative behavior also has a significant effect on employees' inertia (γ_{12} = 0.163, p < 0.01; γ_{22} = 0.114, p < 0.05), supporting H2a and H2b. Employees with strong innovation behavior are more likely to actively challenge inertial behaviors within the organization, with those higher in internal control being more inclined to support change, thereby altering some inertial cultures within the organization. Moreover, employees' experience inertia and learning inertia have a significant and positive effect on employees' open innovation (β31 = 0.185, p < 0.05; β32 = 0.644, p < 0.001), supporting H3a and H3b. It underscores how cross-institutional activities facilitate knowledge exchange and market access, thereby fostering innovation. This underscores the necessity for organizations to cultivate entrepreneurial skills while strategically engaging in global markets to effectively drive innovation.

4.3. Mediation effect

To examine the direct and indirect effects of employees' achievement need on open innovation, this study used the approach proposed by Hayes (2017). The results showed that all direct effects in the proposed hypotheses were supported. Specifically, hypotheses H4 and H5 were confirmed (Table 4).

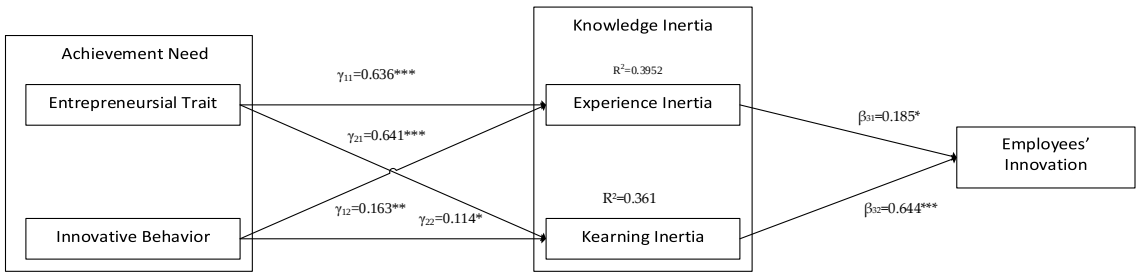
Table 1: Respondent demographics

Demographic items	Frequency	Percentage
Gender		
Male	298	55.9
Female	283	44.1
Age		
25-35 years	94	16.2
36-40 years	135	23.2
41-50 years > 4	211	36.3
> 50 years	141	24.3
Education		
Bachelor's and vocational	241	41.5
Undergraduate degree	172	29.6
Graduate degree	168	28.9
Department		
R&D	104	17.9
Marketing	163	28.1
Production	141	24.2
Others	173	29.8

Table 2: Correlation matrix for measurement scales

Constructs	Mean	SD	ET	IB	EI	LI	OI
ET	5.4	1.06	0.813				
IB	5.53	1.09	0.316**	0.753			
EI	5.58	1.06	0.613**	0.336**	0.862		
LI	5.09	1.1	0.585**	0.286**	0.668**	0.817	
OI	5.34	1.08	0.603**	0.347**	0.644**	0.742**	0.751

ET: Entrepreneurial trait; IB: Innovative behavior; EI: Experience inertia; LI: Learning inertia; OI: Open innovation; **: p < 0.01



Model fit: χ^2/df = 3.967, GFI = 0.903, NFI = 0.907, CFI = 0.908, IFI = 0.908, and RMSEA= 0.069

Fig. 2: Structural model

5. Discussion

5.1. Key finding

Entrepreneurial traits play a crucial role in shaping employees' experiences and their willingness to adapt to new challenges and knowledge. Traits such as ambition, goal orientation, and resilience significantly influence how employees approach their work and interact with new information. Employees have a strong desire to achieve organizational goals. This resilience can lead to a proactive attitude toward learning and adapting, which contrasts with experience inertia. In addition, employees' experience with inertia can hinder an employee's ability to embrace change. This result

aligns with prior studies, which prove that the correlation between entrepreneurial traits and experience inertia is significant (Kuvshinikov and Kuvshinikov, 2024; Tan et al., 2021). Employees with strong entrepreneurial traits are more likely to challenge their own routines and seek out new knowledge, thereby reducing the impact of experience inertia. Employees who are motivated by a desire for success and personal development are more likely to overcome experience inertia, which can present obstacles to change. This promotes an innovative and ongoing learning culture in the workplace. In the end, this dynamic improves organizational and individual performance, resulting in a workforce that is more responsive and nimbler.

Table 3: Measurement results

Constructs	Factor loading	CR	AVE	Cronbach's α
Entrepreneurial trait				
I want to have better achievements at work.	0.832			
I must do things with the end in mind.	0.827			
I feel I have ambition.	0.872			
When I encounter difficulties at work, I will still do my best to accept the challenge.	0.875	0.943	0.672	0.839
I try to perform better than others.	0.818			
I strive to achieve a good personal vision.	0.786			
Behavioral Intention				
I think a person's life is determined by their own actions.	0.776			
I believe that most of the success of a company is not determined by the operation of luck.	0.796	0.851	0.576	0.853
The success of my life depends mainly on my own efforts.	0.737			
I am willing to become the best employee.	0.739			
Experience Inertia				
I am used to using the same pipeline to get new knowledge.	0.866	0.946	0.756	0.882
I rely heavily on knowledge or experience acquired in the past in my work and life.	0.974			
I am used to using the same model to run the team I belong to.	0.761			
The extent to which I accept new knowledge is influenced by my past knowledge or experience.	0.941			
I will not easily change the way I solve problems because of the advice of others	0.747			
I am used to using the same procedures or methods to solve the same problems.	0.896			
I like to learn new ideas and new methods in my work.	0.818			
I am used to using the same pipeline to get new knowledge.	0.900			
Learning inertia				
If I encounter a new problem in my work, I will try to solve it in a new way.	0.783			
Even after learning new ideas, it is difficult to change my own thoughts and behaviors.	0.774			
I like to participate in various study activities inside and outside the company.	0.867	0.935	0.681	0.934
I don't need to learn new knowledge or methods much in my work.	0.886			
I rarely use other people's methods of solving problems.	0.844			
Open Innovation				
I often let others read and appreciate my novel ideas.	0.713			
Even if I do the same thing, I like to try to use different methods.	0.725			
Others will ask me for help or advice if they have problems with creativity and innovation.	0.832			
I often have original ideas about how to do things.	0.8441	0.894	0.577	0.894
In social situations, I often take the initiative to get to know people.	0.754			
I often participate in the activities of outside organizations or associations outside my workplace.	0.667			

Model fit: $\chi^2/df = 3.451$, GFI = 0.956, NFI = 0.958, CFI = 0.958, IFI = 0.958, and RMSEA= 0.046

Table 4: Mediation result

Direct effect				β	*t*		95% CI
Entrepreneurial trait	→	open innovation		0.393	9.180***		(0.635, 0.782)
Innovative behavior	→	open innovation		0.149	4.496***		(0.085, 0.212)
Indirect effect					β	SE	95% CI
Entrepreneurial trait	→	experience inertia	→	open innovation	0.316	0.043	(0.232, 0.401)
Innovative behavior	→	learning inertia	→	open innovation	0.407	0.034	(0.342, 0.479)
Entrepreneurial trait	→	experience inertia	→	open innovation	0.202	0.031	(0.144, 0.267)
Innovative behavior	→	learning inertia	→	open innovation	0.203	0.030	(0.142, 0.263)

***: $p < 0.001$

Entrepreneurial traits significantly influence employees' learning inertia, shaping how they approach challenges and adapt to new knowledge. Employees are more inclined to take on new challenges when they communicate a desire for greater accomplishments and keep a clear vision of their objectives. When faced with challenges, this ambition pushes individuals to look for creative

solutions and encourages them to try new things rather than depending only on tried-and-true strategies. Employees who find it difficult to change their thoughts and behaviors, even after acquiring new knowledge, may struggle to implement innovative solutions. This resistance can stem from a comfort with familiar processes or a lack of confidence in applying new ideas. This aligns with prior studies that found that employees with strong entrepreneurial traits are often more inclined to participate in various learning activities, both within and outside the company (Troise and Tani, 2021). Employees who strive for excellence may be more willing to consider alternative methods of problem-solving, even if they have traditionally relied on their own approaches. This willingness to learn from others can facilitate a shift in mindset, allowing them to integrate new ideas into their work. Hence, organizations can help employees overcome learning inertia and enhance employees' performance and adaptability in the workplace, towards fostering a culture of continuous learning and encouraging participation in various educational activities.

Innovative behavior is significantly influenced by an employee's belief in personal agency and control over employees' career. It pushes employees to look outside the box and approach challenges proactively. Workers are more likely to take the initiative and try out novel ideas if employees' achievement is mostly the consequence of their work. Experience inertia, which frequently shows itself as a dependence on tried-and-true methods and prior knowledge, can be overcome towards the idea. This supports preliminary studies that found that employees are more inclined to question novel ways to problem-solving (Han and Ni, 2025; Ma et al., 2023). It implies that innovation may be hampered by experience inertia. Workers may be resistant to new ideas if they are used to learning in the same way. This dependence on tried-and-true processes can cause stagnation because employees may be reluctant to stray from tried-and-true approaches, especially in the face of novel difficulties. Innovative behavior among employees can be greatly enhanced by a belief in personal agency and a knowledge that one's own actions play a major role in determining success. This way of thinking pushes people to overcome experience inertia, accept new information, and consider creative solutions, which eventually promotes an environment of adaptation and constant progress at work.

Knowledge inertia significantly influences employees' engagement in open innovation by creating barriers that hinder employees' ability to adapt to new ideas and collaborative practices. Employees frequently oppose change when they become dependent on well-established knowledge and accustomed practices. This reluctance might hinder creativity because people could fail to see important information from outside sources like partners, clients, or industry experts—that is essential for fostering innovation. Furthermore, knowledge inertia can lead to a limited perspective, where employees focus narrowly on past experiences and established practices, preventing them from recognizing the potential benefits of diverse viewpoints and ideas that are essential in an open innovation context (Arsanti et al., 2024; Jing et al., 2023). It creates a culture of caution, where individuals are hesitant to experiment or take bold steps in collaboration with external partners, ultimately limiting the organization's capacity for innovation. Knowledge inertia can facilitate the collaboration process, and it is challenging for employees to accommodate different methodologies and perspectives from diverse stakeholders. It can hinder effective collaboration, as employees may be less willing to integrate new ideas or adjust their practices based on input from external collaborators. Moreover, the underutilization of external resources and expertise can occur when employees, comfortable with their existing knowledge, fail to actively seek out or engage with external sources of innovation.

5.2. Theoretical implications

The theoretical implications of knowledge inertia on open innovation are significant, as employees highlight the interplay between personal cognition, organizational culture, and collaborative practices. Knowledge inertia suggests that employees' reliance on established knowledge and routines can create cognitive barriers that inhibit their ability to engage in innovative behaviors. This is consistent with organizational learning theories, which highlight the value of flexibility and the ongoing development of organizational knowledge. Employees who are adamantly loyal to their existing frameworks could find it hard to embrace new ideas, which limits the potential for open innovation. Strategies for promoting an open and flexible culture can be informed by an understanding of the psychological elements that contribute to knowledge inertia. Knowledge inertia also affects social learning theory, which holds that employees obtain knowledge by exchanging information and knowledge. Employees may lose out on opportunities to learn from different viewpoints and stifle collaborative creativity if they are resistant to outside input because of knowledge stagnation. This highlights how crucial it is for companies to create environments that encourage international collaboration and information sharing. It demonstrates how knowledge inertia's theoretical ramifications for open innovation highlight how important it is for businesses to remove cognitive obstacles, promote an adaptable culture, and make use of social learning processes.

5.3. Practical implications

The achievement needs and knowledge inertia effect on employees' open innovation are critical for organizations seeking to enhance organizational performance. Organizations or firms must recognize that entrenched knowledge and established routines

can hinder employees' willingness to embrace new ideas. Furthermore, implement training programs that promote a growth mindset, encouraging employees to view challenges as opportunities for learning and development. It can also help employees overcome reliance on familiar practices. Promoting cross-functional collaboration is essential for facilitating interactions among diverse teams. Organizations can expose employees to different perspectives and approaches, breaking down silos that contribute to knowledge inertia. This can be achieved through workshops, brainstorming sessions, and collaborative projects that encourage knowledge sharing and collective problem-solving. Finally, leadership plays a crucial role in addressing knowledge inertia. Leaders should model adaptive behaviors and demonstrate a commitment to innovation, signaling to employees that embracing new ideas is valued and supported. Organizations may successfully counteract the impacts of knowledge inertia and promote an open, innovative culture that propels growth and competitive advantage by implementing these doable measures.

5.4. Conclusions

Knowledge inertia presents a significant challenge to open innovation within organizations, as it can inhibit employees' willingness to embrace new ideas and collaborative practices. The reliance on established knowledge and routines can create cognitive barriers that stifle creativity and limit the potential for innovative breakthroughs. Organizations must actively foster a culture that encourages adaptability, continuous learning, and experimentation to mitigate this issue. Companies can help employees overcome the constraints of knowledge inertia and become more receptive to innovative concepts towards promoting a growth mindset, facilitating cross-functional collaboration, and engaging with external partners. Furthermore, encouraging employees to venture outside of their comfort zones by praising and rewarding creative efforts can create a culture that values experimentation. In this transition, leadership is vital because leaders need to set an example of adaptable behavior and show that they are dedicated to innovation, which tells staff that change is necessary for the success of the company. Resolving knowledge inertia involves more than just overcoming resistance to change; it also entails creating a dynamic corporate culture that encourages diverse perspectives and collaborative problem-solving. Implementing openness and adaptability rules can help organizations become more innovative, leverage outside expertise, and promote long-term success in a highly competitive environment.

5.5. Limitations and future study directions

A significant limitation of existing research is its context-specific nature, often focusing on sectors or organizational environments. This specificity can restrict the generalizability of findings, as the dynamics of knowledge inertia can vary widely across different industries and cultural contexts. First, a large portion of the research that is currently available is context-specific, frequently concentrating on certain sectors or organizational environments. Comparing different industries should be the goal of future research to better understand how knowledge inertia appears in various contexts and to find optimal practices that are applicable everywhere. Second, more reliable quantitative measures to evaluate knowledge inertia and its impact on innovation results could be developed for future studies. Lastly, as technology develops further, especially with the emergence of digital tools and platforms, it is crucial for future studies to explore how these advancements influence knowledge inertia and open innovation. Understanding these cultural dynamics is essential for interpreting research findings and developing effective strategies for fostering open innovation. Future studies should incorporate cultural dimensions into research frameworks, examining how cultural attitudes toward risk, collaboration, and authority impact knowledge inertia and innovation outcomes.

List of abbreviations

AVE	Average variance extracted
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CI	Confidence interval
CLF	Common latent factor
CMV	Common method variance
CR	Composite reliability
EI	Experience inertia
ET	Entrepreneurial trait
GFI	Goodness of fit index
IB	Innovation behavior
IFI	Incremental fit index
LI	Learning inertia
NFI	Normed fit index
OI	Open innovation
OLT	Organizational learning theory
R&D	Research and development
RMSEA	Root mean square error of approximation
SD	Standard deviation
SE	Standard error
SEM	Structural equation modelling
α	Cronbach's alpha
β	Standardized regression coefficient
χ^2/df	Chi-square divided by degrees of freedom

Compliance with ethical standards

Ethical considerations

This research was reviewed and approved by the Ethics Committee of Mahachulalongkornrajavidyalaya University, Thailand (Approval Letter No. R 205/2024). Participation in this study was voluntary. Informed consent was obtained from all participants prior to data collection, and consent to use the anonymized

data for publication was also secured. All participants provided their consent through the online survey forms.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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