



Factors Influencing Employee's Innovative Self-Efficacy in Architecture Firms: A Comprehensive Review

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Abstract

Innovation is the lifeblood of the architecture industry, driving progress and shaping the built environment. Within architecture firms, the innovative self-efficacy of employees plays a pivotal role in fostering creativity, problem-solving, and ultimately, the success of projects. This comprehensive review article delves into the myriad factors that influence an employee's innovative self-efficacy in architecture firms. By understanding and addressing these factors, firms can harness the full creative potential of their workforce, leading to enhanced design solutions and sustainable growth. The purpose of this research is to systematically examine and comprehensively understand the multifaceted factors that influence an employee's innovative self-efficacy within architecture firms. Innovative self-efficacy, the belief in one's capacity to generate novel ideas and contribute to innovation, is recognized as a critical driver of creativity, problem-solving, and project success in the architecture industry.

Keywords: Innovation; Architecture firms; Innovative self-efficacy; Creative potential; Sustainable growth.

1. Introduction

In today's competitive business landscape, companies must turn innovative ideas into valuable assets to boost their creative prowess and revenue generation [1].

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Business leaders aim to enhance revenue by cultivating creativity and innovation within their organizations.

Organizational innovation, a dynamic process involving interactions among individuals, teams, and organizational factors, significantly influences innovation emergence and implementation [2,3].

An environment that stimulates and encourages innovation, alongside individual creative skills, strengthens employees' innovativeness and fosters systematic innovation [4]. Belief in one's innovative abilities, known as innovative self-efficacy, plays a crucial role in driving innovative behavior and organizational performance [5]. Organizations valuing creativity and innovation tend to have employees with higher innovative self-efficacy [6].

Creative capabilities empower individuals to experiment, adapt, and improvise. Organizational creativity promotes learning, effecting positive change through collegial support, leadership, adaptability, flexibility, and autonomy [7]. Companies must convert innovative ideas into assets to boost creative capabilities and revenue. Individual creativity alone isn't sufficient; the organizational environment, including the innovation climate, significantly influences individuals' willingness and ability to innovate [8]. Overall, nurturing creativity is vital for positive workplace change and human resource development across various fields. Through a systematic analysis of these research objectives, this study aims to identify the potential factors that lead to employee innovative self-efficacy. This will provide architecture firms with valuable insights to foster a culture of innovation, leading to enriched design solutions, enhanced problem-solving capabilities, and sustainable growth within the industry.

2. Methodology

This section discusses the systematic literature review by using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). PRISMA is a widely recognized and widely used set of guidelines and a checklist for conducting systematic reviews and meta-analyses of research studies in healthcare and other fields [9]. PRISMA provides a structured approach for researchers to plan, conduct, and report systematic reviews in a transparent and comprehensive manner. Adhering to PRISMA guidelines helps ensure the rigor and transparency of systematic reviews, making it easier for readers to assess the quality of the review and the evidence it presents [10].

A systematic review methodology was employed to identify and evaluate relevant literature. Electronic databases such as PubMed, Google Scholar, and IEEE Xplore were searched using a predefined set of keywords and inclusion/exclusion criteria. Articles published between 2000 and 2021 were considered for inclusion.

The PRISMA method describe key components often associated with systematic reviews, which include:

1. **Objective and Research Question:** The research objective is to identify and evaluate literature on the factors influencing innovative self-efficacy in architecture firms.
2. **Search Strategy:** The study outlines the use of electronic databases, including Connected, Google Scholar, and IEEE Xplore, for searching relevant articles. This step aligns with the PRISMA approach, which emphasizes a comprehensive and systematic search of various databases.

3. **Keywords and Inclusion/Exclusion Criteria:** A predefined set of keywords and inclusion/exclusion criteria were employed during the search process. This is an essential step in a systematic review to ensure that only relevant studies meeting specific criteria are included. The inclusion and exclusion criteria in this study refer to the predefined set of rules used to determine which research studies are eligible for inclusion in the systematic review and which should be excluded. These criteria help ensure that only relevant studies meeting specific requirements are considered for the review.

Inclusion Criteria:

- a. Studies that are relevant to the research topic or question.
- b. Studies that meet the predefined set of keywords used in the search process. The keywords include “Innovative”, “Architecture firms”, “Innovative self-efficacy”, “innovation” AND “employee”, “innovative self-efficacy” AND “employee”, “innovative” AND “architecture firm employee”, “Innovative Work Behaviors”.
- c. Studies that align with the specific focus and objectives of the systematic review.
- d. Studies that have been published within a certain time frame. Articles published between 2000 and 2023 were considered for inclusion. Setting a specific time frame is common in systematic reviews to focus on the most recent and relevant literature.

Exclusion Criteria:

- a. Studies that are not relevant to the research topic or question.
- b. Studies that do not contain the predefined keywords used in the search.
- c. Studies that do not align with the specific focus and objectives of the systematic review.
- d. Studies that do not meet any additional criteria set by the reviewers, such as publication date restrictions or study design limitations. For example, publication below year 2000. These criteria help ensure that the systematic review includes studies that are directly related to the research question and meets the predefined standards for relevance and quality. Studies that do not meet these criteria are excluded from the review to maintain the rigor and validity of the research synthesis.

These elements include a clear research question, a comprehensive search strategy, predefined inclusion/exclusion criteria, and a systematic selection process to identify relevant articles. The PRISMA guidelines provide a framework for conducting systematic reviews, ensuring transparency and rigor in the review process, and the methodology described aligns with the principles of systematic reviewing.

3. Results and Findings

This section discuss about the definition and concept of innovative self-efficacy, . innovative work behaviors, innovative among architecture firm employee, potential factors that affects employee’s innovative self-efficacy.

3.1. Definition and Concept of Innovative Self-Efficacy

The concept of innovative self-efficacy, rooted in the study of Tierney and Farmer (2002) [11], builds upon [12] Bandura's (1997) notion of "self-efficacy" and [13] Gist and Mitchell's (1992) work-related self-efficacy. It is essential to understand the broader concept of self-efficacy and the underpinning social cognitive theory, which asserts that behavior, cognition, and various components interact dynamically [13] (Gist & Mitchell, 1992).

Innovation is a challenging process, demanding not only intrinsic motivation and empathy but also the ability to maintain confidence and belief when facing obstacles and challenges. This significantly influences a company's capacity to innovate, as per social cognitive theory [14]. Innovative self-efficacy represents an individual's confidence in their ability to generate creative outcomes at work. Those with higher innovative self-efficacy are more inclined to challenge routines and embrace alternative perspectives and ideas, crucial for navigating the learning process amid setbacks and crises in innovation.

Innovative self-efficacy can be directed towards employees across all organizational levels to assess their level of confidence in their capacity to creatively address challenges and attain work objectives [15]. When employees possess high levels of confidence in their innovative self-efficacy, they are more likely to enthusiastically engage in creative endeavors.

Innovative self-efficacy is a critical concept in the realm of creativity and innovation within organizations. It pertains to an individual's belief or confidence in their ability to generate innovative and creative ideas, solve complex problems, and contribute to innovation efforts in their workplace [16]. This confidence plays a pivotal role in driving innovation and creativity because individuals who possess high levels of innovative self-efficacy are more likely to actively engage in creative tasks, persist in the face of challenges, and take risks to explore new solutions. Innovative self-efficacy consists of several dimensions:

1. **Idea Generation Self-Efficacy:** This dimension reflects an individual's confidence in their capacity to generate novel and creative ideas. Employees with high idea generation self-efficacy believe they can come up with innovative solutions to problems or challenges [17]. Employees possessing strong creative self-efficacy exhibit confidence in recognizing problems and generating ideas, leveraging their skills and knowledge [18, 19].
2. **Problem-Solving Self-Efficacy:** Problem-solving self-efficacy relates to an individual's belief in their ability to analyze complex problems, identify potential solutions, and effectively implement those solutions. Those with high problem-solving self-efficacy are more likely to tackle challenging issues with confidence [20].
3. **Risk-Taking Self-Efficacy:** Innovation often involves taking risks and trying new approaches. Risk-taking self-efficacy refers to an individual's confidence in their ability to take calculated risks and handle the uncertainty associated with innovation [21, 22].
4. **Persistence and Resilience:** This dimension relates to an individual's determination and resilience in the face of setbacks and failures. Those with high persistence and resilience self-efficacy are more likely to persevere and learn from failures, which is crucial in the innovation process [23].

5. **Adaptability and Flexibility:** Innovators need to be adaptable and flexible in their thinking and approaches. Adaptability self-efficacy reflects an individual's confidence in their ability to adapt to changing circumstances and pivot when necessary [24].
6. **Communication and Collaboration:** Effective communication and collaboration are essential for bringing innovative ideas to fruition. Communication and collaboration self-efficacy relate to an individual's confidence in their ability to effectively communicate their innovative ideas and collaborate with others in the innovation process [25].

These dimensions of innovative self-efficacy are not mutually exclusive and often overlap. For instance, someone with high idea generation self-efficacy is likely to also exhibit high problem-solving self-efficacy. The combination of these dimensions contributes to an individual's overall innovative self-efficacy, which, in turn, influences their innovative behavior and the overall culture of innovation within an organization. Organizations that recognize and nurture these dimensions of self-efficacy can foster a more innovative and creative workforce, which is crucial for staying competitive and adapting to a rapidly changing business environment.

3.2. Innovative Work Behaviors

Numerous studies have explored strategies to bolster employees' innovative capabilities, categorizing these behaviors into four key areas: problem identification and idea generation, idea promotion, idea implementation, and knowledge-sharing through technology [26]. Identifying problems and generating ideas are seen as pivotal steps in fostering an innovation-driven work culture. The subsequent phases encompass advocating for, executing, and selecting ideas for workplace application.

Influential factors impacting innovative work behavior extend from both individual and organizational dimensions. Individual factors encompass job autonomy, happiness, proactive behavior, innovative self-efficacy, and work passion [27, 28]. Meanwhile, organizational factors, including competency, self-efficacy, motivation, and organizational commitment, have also been examined for their influence on innovative work behavior [29].

Environmental factors further shape innovative work behavior, encompassing elements like knowledge sharing, information technology, job stressors, and the organizational innovation climate [30]. Some research has delved into the combined effect of personal and environmental factors, such as the interplay between knowledge sharing, innovative self-efficacy, job satisfaction, servant leadership, and transformational leadership [31].

The synergy between personal and environmental factors significantly influences innovative work behavior. Supportive organizational cultures and positive work environments have been shown to enhance employees' innovative self-efficacy and job satisfaction, thereby promoting innovation [32]. Furthermore, effective knowledge sharing and technology usage facilitate idea and resource exchange, fostering creativity and innovation in the workplace [33]. A supportive work environment that encourages creativity, provides knowledge-sharing, skill-building, and diverse experiences fosters innovative self-efficacy. This contributes to increased motivation, engagement, job satisfaction, reduced stress, and enhanced psychological capital [34].

Employee innovation, essential for organizational competitiveness, involves generating and implementing

valuable ideas and processes [35]. It encompasses active idea development and resource integration to create valuable products.

3.3. Innovative among Architecture Firm Employee

Creativity within organizational behavior is defined by the generation of unique and valuable outcomes, such as new products, services, business models, work practices, or management processes. Researchers often measure creativity through instruments assessing both originality and practicality, quantifying it as an output. Social and personality psychology studies, however, emphasize novelty, fluency, flexibility, and originality in defining creativity [36].

A study by [37] explored how design firms transformed their typical services into groundbreaking design efforts, highlighting creativity as a result of various factors and processes. While creativity serves as a tactical tool, it also enhances product and service distinctiveness. Architectural and design practitioners consider narrative methods to understand creative opportunities, complementing factorial measurements supported by theoretical and practical knowledge. Conceptual analysis conducted by Amabile and his colleagues. (2018) [38] examined definitions of creativity in architectural and design journals, highlighting creativity's central role in practice. This research underscores the significance of creativity in shaping physical environments.

3.4. Potential Factors that affect Employee's Innovative Self-efficacy

Innovation among employees in architecture firms is a critical factor for the success and competitiveness of these organizations. The architectural industry, like many other fields, is undergoing significant changes and challenges, making innovation a key driver for staying relevant and thriving in a dynamic environment. There are some important aspects to consider regarding innovation among architecture firm employees:

a. Creativity and Design Thinking

Architects are inherently creative professionals. They are trained to think critically, visualize, and come up with unique design solutions. Encouraging and nurturing this inherent creativity is essential for fostering innovation. Architecture firms often employ design thinking methodologies to encourage creative problem-solving and the generation of innovative design concepts [39].

b. Collaboration and Interdisciplinary Teams

Innovation often thrives in collaborative environments. Architecture firms are increasingly recognizing the value of interdisciplinary teams that bring together architects, engineers, interior designers, and other experts. These diverse teams can generate novel ideas and integrated solutions that drive innovation [40].

c. Technological Advancements

The architecture field has been significantly impacted by technology. Building Information Modeling (BIM), 3D modeling software, and virtual reality tools have transformed the design and construction processes. Employees who

are skilled in these technologies can contribute to innovative and efficient project workflows [41].

d. Sustainability and Environmental Considerations

Sustainable design and environmentally friendly practices are at the forefront of architecture today. Employees who are knowledgeable about sustainable building materials, energy-efficient designs, and green building certifications contribute to innovative and eco-friendly projects [42].

e. Client-Centered Innovation

Understanding client needs and preferences is crucial for innovation in architecture. Architects who can translate client requirements into innovative and functional designs create value for both the client and the firm. This client-centric approach can lead to repeat business and referrals [43].

f. Continuous Learning and Professional Development

Architecture firms that prioritize ongoing training and development for their employees create a culture of learning and innovation. Employees who are encouraged to stay updated with industry trends and emerging technologies are more likely to bring innovative ideas to projects [44].

g. Innovation in Project Delivery

Innovations in project management and delivery methods, such as lean construction practices or integrated project delivery (IPD), can lead to more efficient and cost-effective projects. Employees who understand and implement these methodologies contribute to the firm's innovation efforts [45].

h. Risk-Taking and Learning from Failure

Innovation often involves taking calculated risks. Employees in architecture firms should feel empowered to experiment with new ideas and approaches, even if they may not always succeed. Learning from failure is a valuable aspect of fostering a culture of innovation [46].

i. Recognition and Rewards

Acknowledging and rewarding innovative contributions by employees can motivate them to continue seeking innovative solutions. Recognizing creativity through awards or promotions can be a powerful incentive [47].

j. Market Adaptation

Architecture firms also need to be innovative in how they adapt to changing market demands, economic conditions, and technological disruptions. Employees who are adaptable and forward-thinking can help firms stay competitive [48 - 50].

5. Conclusion

In the realm of employee innovative self-efficacy, numerous factors wield substantial influence over an individual's conviction in their capacity to generate inventive ideas and make valuable contributions to an organization's innovative endeavors. A profound comprehension of these factors is imperative for organizations aspiring to cultivate a vibrant culture of innovation and creativity among their workforce.

Consider, for instance, the role of job autonomy. Employees granted a higher degree of autonomy within their roles tend to manifest elevated levels of innovative self-efficacy. When individuals are afforded the latitude to make decisions, engage in experimentation, and take ownership of their responsibilities, their belief in their aptitude for innovation is invariably heightened.

Furthermore, proactive employees, those who seize the initiative, actively seek out innovation opportunities, and contribute to proactive problem-solving, are more inclined to harbor augmented innovative self-efficacy. Their proactive demeanor becomes a reinforcing catalyst, fortifying their confidence in their ability to instigate positive transformations.

Leadership styles that wholeheartedly endorse and endorse innovation, such as transformational leadership, possess the capacity to exert a constructive impact on employees' innovative self-efficacy. Leaders who dispense guidance, instill confidence, and acknowledge the worth of imaginative contributions significantly enhance their employees' faith in their innovative potential.

The ardor for one's vocation and a bona fide enthusiasm for assigned tasks have the potential to invigorate innovative self-efficacy. In scenarios where individuals exhibit genuine zeal for their professional pursuits, they invariably tend to project a more resolute belief in their innovation capabilities.

Furthermore, the possession of indispensable knowledge and skills relevant to one's role emerges as a pivotal determinant of innovative self-efficacy. Employees who harbor a sense of competence and proficiency in their designated roles are more likely to harbor the conviction that they can innovate effectively.

Psychological factors, such as self-assurance, optimism, and the cultivation of a growth-oriented mindset, hold substantial sway over innovative self-efficacy. Those who maintain a constructive psychological disposition demonstrate a proclivity to perceive challenges as opportunities ripe for innovation.

Intrinsic motivation, propelled by a genuine ardor for one's work and an earnest aspiration to effect meaningful change, stands inextricably linked to heightened innovative self-efficacy. When individuals are intrinsically driven to innovate, their belief in their ability to do so assumes a fortified character.

Furthermore, an individual's alignment with the organization's objectives and their commitment thereto can exert a noteworthy influence on their innovative self-efficacy. Employees who harbor a sense of loyalty and resonate with the organization's core values are more likely to invest themselves wholeheartedly in creative pursuits.

The overarching organizational ambiance and its culture with respect to innovation play pivotal roles in shaping employee innovative self-efficacy. An environment that actively nurtures and incentivizes creativity invariably engenders a more robust belief in one's capacity to innovate.

Moreover, the dynamics of collaborative, supportive teams have the potential to augment innovative self-efficacy. When employees find themselves within teams that proffer encouragement and validation, their confidence in their innovative aptitude is invariably bolstered.

In summation, employee innovative self-efficacy represents a nuanced interplay of individual attributes, leadership styles, organizational ethos, and environmental factors. The acknowledgment and cultivation of these multifaceted factors collectively contribute to a workforce that is not only more self-assured but also inherently more adept at driving innovation within the organizational framework.

References

- [1]. Perifanis, N-A., & Kitsios, F. (2023). Investigating the Influence of Artificial Intelligence on Business Value in the Digital Era of Strategy: A Literature Review. *Information*, 14(2), 85. <https://doi.org/10.3390/info14020085>
- [2]. Alharbi, I. , Jamil, R. , Mahmood, N. and Shaharoun, A. (2019) Organizational Innovation: A Review Paper. *Open Journal of Business and Management*, 7, 1196-1206. doi: [10.4236/ojbm.2019.73084](https://doi.org/10.4236/ojbm.2019.73084).
- [3]. You Y, Hu Z, Li J, Wang Y, Xu M. The Effect of Organizational Innovation Climate on Employee Innovative Behavior: The Role of Psychological Ownership and Task Interdependence. *Front Psychol*. 2022 Jun 20;13:856407. doi: 10.3389/fpsyg.2022.856407. PMID: 35800933; PMCID: PMC9253878.
- [4]. Malibari, Mashael & Bajaba, Saleh. (2022). Entrepreneurial leadership and employees' innovative behavior: A sequential mediation analysis of innovation climate and employees' intellectual agility. *Journal of Innovation & Knowledge*. 7. 100255. [10.1016/j.jik.2022.100255](https://doi.org/10.1016/j.jik.2022.100255).
- [5]. Newman, Alexander & Tse, Herman & Schwarz, Gary & Nielsen, Ingrid. (2018). The Effects of Employees' Creative Self-Efficacy on Innovative Behavior: The Role of Entrepreneurial Leadership. *Journal of Business Research*. 89. [10.1016/j.jbusres.2018.04.001](https://doi.org/10.1016/j.jbusres.2018.04.001).
- [6]. Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and Creativity in Organizations: A State-of-the-Science Review, Prospective Commentary, and Guiding Framework. *Journal of Management*, 40(5), 1297–1333. <https://doi.org/10.1177/0149206314527128>
- [7]. Huang Z, Sindakis S, Aggarwal S, Thomas L. The role of leadership in collective creativity and innovation: Examining academic research and development environments. *Front Psychol*. 2022 Dec 22;13:1060412. doi: 10.3389/fpsyg.2022.1060412. PMID: 36619078; PMCID: PMC9815531.
- [8]. Deng B, Cao J, Huang J, Wu J. The Influence of Innovation Climate on Creative Role Identity: The Mediating Role of Flow. *Front Psychol*. 2022 May 24;13:866464. doi: 10.3389/fpsyg.2022.866464. PMID: 35686075; PMCID: PMC9172635.
- [9]. Page, M.J., McKenzie, J.E., Bossuyt, P.M. *et al*. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Syst Rev* 10, 89 (2021). <https://doi.org/10.1186/s13643-021-01626-4>

- [10]. Page MJ, Moher D, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, Shamseer L, Tetzlaff JM, Akl EA, Brennan SE, Chou R, Glanville J, Grimshaw JM, Hróbjartsson A, Lalu MM, Li T, Loder EW, Mayo-Wilson E, McDonald S, McGuinness LA, Stewart LA, Thomas J, Tricco AC, Welch VA, Whiting P, McKenzie JE. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ*. 2021 Mar 29;372:n160. doi: 10.1136/bmj.n160. PMID: 33781993; PMCID: PMC8005925.
- [11]. Tierney, Pamela & Farmer, Steven. (2002). Creative Self-Efficacy: Its Potential Antecedents and Relationship to Creative Performance. *Academy of Management Journal*. 45. 1137-1148. 10.2307/3069429.
- [12]. Bandura, A. (1997). *Self-efficacy: The exercise of control*. W H Freeman/Times Books/ Henry Holt & Co.
- [13]. Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *The Academy of Management Review*, 17(2), 183–211. <https://doi.org/10.2307/258770>
- [14]. Chughtai, M.S., Syed, F., Naseer, S. *et al*. Role of adaptive leadership in learning organizations to boost organizational innovations with change self-efficacy. *Curr Psychol* (2023). <https://doi.org/10.1007/s12144-023-04669-z>
- [15]. Wan X, He R, Zhang G, Zhou J. Employee engagement and open service innovation: The roles of creative self-efficacy and employee innovative behaviour. *Front Psychol*. 2022 Sep 2;13:921687. doi: 10.3389/fpsyg.2022.921687. PMID: 36118444; PMCID: PMC9481274.
- [16]. Hu, Bei & Zhao, Yidan. (2016). Creative Self-efficacy Mediates the Relationship Between Knowledge Sharing and Employee Innovation. *Social Behavior and Personality: an international journal*. 44. 815-826. 10.2224/sbp.2016.44.5.815.
- [17]. Hamid, Roshayati & Rahid, Mohd Radzuan & Hamid, Siti. (2020). The effects of employee participation in creative-relevant process and creative self-efficacy on employee creativity. *Malaysian Journal of Society and Space*. 16. 10.17576/geo-2020-1602-14.
- [18]. Jiang, W., & Gu, Q. (2017). Leader creativity expectations motivate employee creativity: A moderated mediation examination. *International Journal Human Resource Management*, 28, 724–749
- [19]. Newman, A., Tse, H.H.M., Schwarz, G., & Nielsen, I. (2018). The effects of employees' creative self-efficacy on innovative behavior: The role of entrepreneurial leadership. *Journal of Business Research*, 89, 1-9.
- [20]. Erözkan, Atılgan. (2014). Analysis of Social Problem Solving and Social Self-efficacy in Prospective Teachers. *Educational Sciences: Theory & Practice*. 14. 10.12738/estp.2014.2.2014.
- [21]. Cao Y, Asad MM, Wang L, Naz A, Almusharraf N. Role of personality traits for entrepreneurial intentions of young entrepreneurs: A case study of higher education institution. *Front Psychol*. 2022 Oct 3;13:1010412. doi: 10.3389/fpsyg.2022.1010412. PMID: 36262452; PMCID: PMC9575656.
- [22]. Martins, J.M., Shahzad, M.F. & Xu, S. Factors influencing entrepreneurial intention to initiate new ventures: evidence from university students. *J Innov Entrep* **12**, 63 (2023). <https://doi.org/10.1186/s13731-023-00333-9>
- [23]. Nohut, Fazilet/Balaban, Ozlem (2022). Employee's innovative personality and selfefficacy. In: *Marketing i menedžment inovacij* (1), S. 58 - 66.

https://mmi.fem.sumdu.edu.ua/sites/default/files/A564-2022_04_Nohut%20et%20al_0.pdf.

doi:10.21272/mmi.2022.1-04.

- [24]. Salisu, Isyaku & Hashim, Norashidah & Shehu Mashi, Munir & Galadanchi, Aliyu. (2020). Perseverance of effort and consistency of interest for entrepreneurial career success: Does resilience matter?. *Journal of Entrepreneurship in Emerging Economies*. ahead-of-print. 10.1108/JEEE-02-2019-0025.
- [25]. Sun J. Grit and Resilience as Predictors of Creativity Among Chinese English as a Foreign Language Teachers. *Front Psychol*. 2022 Jun 21;13:923313. doi: 10.3389/fpsyg.2022.923313. PMID: 35800922; PMCID: PMC9255634.
- [26]. Li X, Pu R, Liao H. The impacts of innovation capability and social adaptability on undergraduates' employability: The role of self-efficacy. *Front Psychol*. 2022 Nov 17;13:954828. doi: 10.3389/fpsyg.2022.954828. PMID: 36467135; PMCID: PMC9713522.
- [27]. Yogesh Dwivedi, Laurie Hughes, Abdullah Baabdullah, Samuel Ribeiro-Navarrete, Mihalis Giannakis, et al.. Metaverse beyond the hype: multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 2022, Advances in Marketing, Customer Relationship Management, and E-Services*, 66, pp.102542. (10.1016/j.ijinfomgt.2022.102542). (hal-03731709)
- [28]. de Jong, J., & den Hartog, D. (2010). Measuring innovative work behaviour. *Creativity and Innovation Management*, 19(1), 23–36. <https://doi.org/10.1111/j.1467-8691.2010.00547.x>
- [29]. Baharuddin, M.F., Masrek, M.N., & Shuhidan, S.M. (2019). INNOVATIVE WORK BEHAVIOUR OF SCHOOL TEACHERS: A CONCEPTUAL FRAMEWORK. *IJAEDU- International E-Journal of Advances in Education*.
- [30]. Johari, Aduni & Wahiza, Nor & Zaremohzzabieh, Zeinab. (2021). Innovative Work Behavior among Teachers in Malaysia: The Effects of Teamwork, Principal Support, and Humor. *Asian Journal of University Education*. 17. 1-13. 10.24191/ajue.v17i2.13387.
- [31]. Siregar, Zulkifli & Suryana, & Ahman, Eeng & Senen, Syamsul. (2019). Factors Influencing Innovative Work Behavior: An Individual Factors Perspective. *International Journal of Scientific & Technology Research*. 08. 324-327.
- [32]. Ren, Feifei & Zhang, Jinghuan. (2015). Job Stressors, Organizational Innovation Climate, and Employees' Innovative Behavior. *Creativity Research Journal*. 27. 16-23. 10.1080/10400419.2015.992659.
- [33]. Phung, Dong & Hawryszkiewicz, Igor & Binsawad, Muhammad. (2018). Exploring How Environmental and Personal Factors Influence Knowledge Sharing Behavior Leads to Innovative Work Behavior. 10.1007/978-3-319-74817-7_7.
- [34]. Zhang W, Zeng X, Liang H, Xue Y, Cao X. Understanding How Organizational Culture Affects Innovation Performance: A Management Context Perspective. *Sustainability*. 2023; 15(8):6644. <https://doi.org/10.3390/su15086644>
- [35]. Castaneda, Delio & Cuellar, Sergio. (2020). Knowledge sharing and innovation: A systematic review. *Knowledge and Process Management*. 27. 10.1002/kpm.1637.
- [36]. Chen, I-Shuo. (2016). Examining the linkage between creative self-efficacy and work engagement: The moderating role of openness to experience. *Baltic Journal of Management*. 11. 516-534. 10.1108/BJM-

04-2015-0107.

- [37]. Koziol-Nadolna K. The Role of a Leader in Stimulating Innovation in an Organization. *Administrative Sciences*. 2020; 10(3):59. <https://doi.org/10.3390/admsci10030059>
- [38]. Shao, Yong & Zhang, Chenchen & Zhou, Jing & Gu, Ting & Yuan, Yuan. (2019). How Does Culture Shape Creativity? A Mini-Review. *Frontiers in Psychology*. 10. 10.3389/fpsyg.2019.01219.
- [39]. Leigh, K. E. (2011). *Organizational creativity: The relationship between creativity, values, and performance in architectural practice* (Doctoral dissertation, Colorado State University).
- [40]. Amabile, T. M. (2018). *Creativity in context: Update to the social psychology of creativity*. Routledge.
- [41]. Al-Sayed, K., Dalton, R. C., & Hölscher, C. (2010). Discursive design thinking: The role of explicit knowledge in creative architectural design reasoning. *AI EDAM*, 24(2), 211-230.
- [42]. Olsen, C., & Mac Namara, S. (2021). *Collaborations in architecture and engineering*. Routledge.
- [43]. Ehab A, Burnett G, Heath T. Enhancing Public Engagement in Architectural Design: A Comparative Analysis of Advanced Virtual Reality Approaches in Building Information Modeling and Gamification Techniques. *Buildings*. 2023; 13(5):1262. <https://doi.org/10.3390/buildings13051262>
- [44]. Liu Z, Gong S, Tan Z, Demian P. Immersive Technologies-Driven Building Information Modeling (BIM) in the Context of Metaverse. *Buildings*. 2023; 13(6):1559. <https://doi.org/10.3390/buildings13061559>
- [45]. Hafez, Fatma S. & Sa'di, Bahaeddin & Gamal, Safa & Taufiq-Yap, Yun & Alrifay, Moath & Seyedmahmoudian, Mehdi & Stojcevski, Alex & Horan, B. & Mekhilef, Saad. (2023). Energy Efficiency in Sustainable Buildings: A Systematic Review with Taxonomy, Challenges, Motivations, Methodological Aspects, Recommendations, and Pathways for Future Research. *Energy Strategy Reviews*. 45. 101013. 10.1016/j.esr.2022.101013.
- [46]. Srinivasan, Suresh. (2020). The role of product innovation and customer centricity in transforming tacit and explicit knowledge into profitability. *Journal of Knowledge Management*. 24. 10.1108/JKM-02-2020-0087.
- [47]. Li, L. Reskilling and Upskilling the Future-ready Workforce for Industry 4.0 and Beyond. *Inf Syst Front* (2022). <https://doi.org/10.1007/s10796-022-10308-y>
- [48]. Syed Zuber, Sharifah Zaliha & Mohd Naw, Mohd Nasrun & Abdul Nifa, Faizatul Akmar. (2019). Construction Procurement Practice: A Review Study of Integrated Project Delivery (IPD) in the Malaysian Construction Projects. *International Journal of Supply Chain Management*.
- [49]. Pathak, Pallavi. (2019). Creativity and Innovation in Reward & Compensation Practices.
- [50]. Oyefusi, F. (2022) Effect of Reward Equity on the Inclination for Creative Contributions by the Innovative Employee. *Journal of Human Resource and Sustainability Studies*, 10, 781-794. doi: 10.4236/jhrss.2022.104046.