




Determinants of Lecturer Innovativeness in Higher Education: A PRISMA-Based Systematic Literature Review of Information Technology Literacy, Self-Efficacy, Achievement Motivation, and Knowledge Management

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ABSTRACT

Lecturer innovation is a strategic factor in improving the quality of learning, research productivity, and competitiveness of higher education institutions in the era of digital transformation. However, empirical studies on the determinants of lecturer innovation are still scattered and have not been comprehensively integrated. This study aims to systematically synthesize international literature on the role of information technology (IT) literacy, self-efficacy, achievement motivation, and knowledge management in enhancing lecturer innovation. The study used a Systematic Literature Review (SLR) approach with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Articles were obtained from the Scopus database for the period 2010–2025. After going through the processes of identification, screening, eligibility, and inclusion, a total of 46 empirical articles were analyzed thematically. The results of the study indicate that IT literacy increases the capacity for digital pedagogical innovation; self-efficacy strengthens the courage to experiment and adapt to change; achievement motivation encourages innovative performance orientation; while knowledge management acts as an institutional reinforcement that integrates individual innovation into the organizational system. This study produces an integrative conceptual framework that positions knowledge management as a structural enabler and psychological factors as proximal drivers of lecturer innovation. These findings provide theoretical contributions and strategic implications for the development of higher education policies based on sustainable innovation.

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Introduction

The transformation of higher education in the era of the Industrial Revolution 4.0 and the knowledge economy requires universities to continuously update academic practices, curricula, and learning services to address the complexity of global challenges (OECD, 2019; Marginson, 2018). In this context, lecturer innovation is a strategic resource because lecturers are key agents in the learning process, research, and community engagement (Raman, Don, & Ismail, 2020; Hensley, 2020). Lecturer innovation encompasses not only the ability to generate new ideas but also the ability to adapt and implement new technologies and learning methods effectively (Scott & Bruce, 1994; Fullan, 2016). Furthermore, lecturer innovation does not stand alone but is influenced by a combination of individual factors, such as information technology literacy and self-efficacy, as well as organizational factors such as achievement motivation and knowledge management practices (Bai, Liu, & Wang, 2019; Akbari & Allvar, 2020).

Numerous studies on information technology literacy perspectives have confirmed that digital competence plays a crucial role in fostering pedagogical innovation and professional development of lecturers. Research by Scherer, Siddiq, and Tondeur (2019) in *Computers & Education* shows that digital literacy levels influence lecturers' ability to apply digital tools in teaching. Meanwhile, Tondeur et al. (2017) in *Educational Technology Research and Development* found that strong digital competence positively impacts the use of innovative digital pedagogy. Another study in the *British Journal of Educational Technology* by Howard, Tondeur, Ma, and Yang (2021) confirms that technological literacy plays a prerequisite for adopting innovative learning technology, particularly in the global context impacted by the COVID-19 pandemic (Trust & Whalen, 2020). However, the literature also shows that technological competence does not automatically result in innovative behavior without the support of motivation and an organizational context that encourages change (Kimmons, Hall, & Rosenberg, 2020).

Studies on psychological and motivational perspectives have shown that self-efficacy and achievement motivation are strong determinants of individual innovation. Creative self-efficacy has consistently been shown to predict innovative behavior and research productivity (*Journal of Applied Psychology*; Tierney & Farmer, 2002; Gong, Huang, & Farh, 2009). Research by Klassen and Tze (2014) in *Teaching and Teacher Education* reported a positive relationship between self-efficacy and pedagogical innovation among educators. Furthermore, intrinsic motivation and achievement motivation have been shown to contribute to creativity and professional initiative (Hennessey & Amabile, 2010; Cerasoli, Nicklin, & Ford, 2014). In the context of higher education, Zeng et al. (2019) in *Studies in Higher Education* found that achievement motivation is associated with increased lecturer engagement in innovation-oriented academic activities. At the organizational level, knowledge management practices such as knowledge sharing, learning organizational culture, and inter-unit collaboration have been found to strengthen institutional innovation capacity (Donate & de Pablo, 2015; Andreeva & Kianto, 2012; Ali, 2021).

Although several studies have identified a relationship between information technology literacy, self-efficacy, achievement motivation, and knowledge management with individual innovativeness, several important theoretical and methodological gaps remain. First, most studies examine these variables separately, resulting in a lack of consensus on how all these factors collectively shape lecturer innovativeness. Second, some studies emphasize only one dimension (e.g., digital competence or self-efficacy) without integrating it into a broader, higher-order framework that incorporates individual and organizational aspects (Oke & Fernandes, 2020; Howard et al., 2021). Third, to date, there has been no systematic PRISMA-based review that holistically summarizes empirical evidence regarding the relationship between these four determinants in the global context of higher education.

Previous research findings demonstrate the importance of conducting a comprehensive synthesis study using a PRISMA-based Systematic Literature Review (SLR) approach that integrates information technology literacy, self-efficacy, achievement motivation, and knowledge management into a single framework of lecturer innovativeness determinants. The novelty of this research lies in the development of a multi-level integrative conceptual model that has not been systematically explained, as well as in the empirical mapping of inter-variable relationships based on study results in articles published in international journals. The research findings are expected to not only enrich the theoretical foundation but also provide practical recommendations for higher education institutions in designing lecturer development programs based on sustainable innovation.

Method

Research Design

This study employed a Systematic Literature Review (SLR) approach, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines, to ensure the review process was transparent, systematic, and replicable (Page et al., 2021; Snyder, 2019; Tranfield et al., 2003). This approach was chosen because the research objective was not simply to summarize the literature but to critically synthesize international empirical evidence to build an integrative conceptual framework on the determinants of lecturer innovativeness. By using a PRISMA-based SLR, this study positioned the process of article identification, selection, and analysis as a structured scientific procedure, ensuring that the synthesis results had a strong methodological basis (see Figure 1).

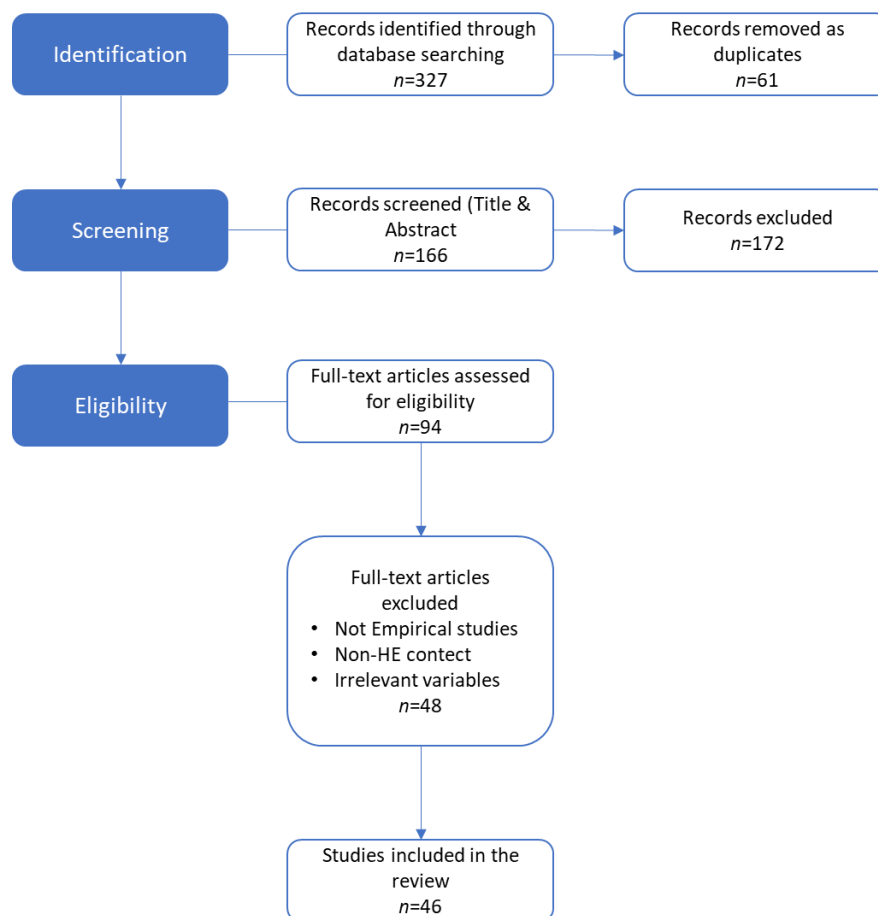


Figure 1. PRISMA Process Shadow

Data Sources and Search Strategy

The literature search was conducted using reputable international databases, including Scopus as the primary source, and Web of Science and ERIC as supporting databases. These three sources were selected because they cover high-quality international journals in education, management, and the social sciences. The publication period was limited to 2010–2025 to capture the dynamics of higher education transformation in the digital era and post-pandemic.

The search strategy used a combination of keywords representing research variables, such as "lecturer innovativeness," "faculty innovation," "digital literacy," "IT literacy," "self-efficacy," "achievement motivation," "knowledge management," and "higher education." Boolean operators (AND/OR) were used to ensure the relevance and accuracy of the search results. The search was limited to English-language peer-reviewed journal articles to maintain academic consistency and source quality.

Inclusion and Exclusion Criteria

Inclusion criteria were established to ensure that the articles analyzed had adequate conceptual relevance and methodological quality. Included articles were empirical studies (quantitative, qualitative, or mixed methods), indexed in international databases, focused on the higher education context, and addressed at least one of the four main research variables. Conversely, purely conceptual articles without empirical data, conference proceedings, editorials, and studies outside the higher education context were excluded from the analysis. This process aimed to maintain contextual consistency and the validity of the resulting synthesis.

Article Selection Process

The selection process followed the PRISMA process, which consists of identification, screening, eligibility, and inclusion. During the identification stage, 327 articles were obtained from the entire database. After removing duplicate articles, 266 articles remained, which were then screened based on their titles and abstracts to assess their initial relevance to the research focus. This stage resulted in 94 articles deemed worthy of full review.

In the full-text review stage, articles were thoroughly analyzed to ensure appropriateness of variables, context, and methodological quality. Articles that did not meet the criteria were systematically eliminated, with the rationale for exclusion documented. In the final stage, 46 articles met all criteria and were included in the synthesis process.

Data Extraction Procedure

Each selected article was analyzed using a systematically designed data extraction sheet. Information collected included publication identification (author, year, journal, country), study design, sample size and characteristics, theoretical framework used, analysis methods, and key findings regarding the relationships between variables. The extraction process was conducted consistently to ensure that all articles were analyzed to the same standards. This was essential to minimize interpretation bias and maintain the integrity of the findings synthesis.

Data Analysis and Synthesis Techniques

The analysis was conducted using a thematic synthesis approach aimed at identifying patterns of relationships between variables. Initially, key concepts related to lecturer innovation and its determinants were identified. These concepts were then grouped into individual factors (information technology literacy, self-efficacy, achievement motivation) and organizational factors (knowledge management).

The synthesis was conducted narratively and analytically by comparing findings across studies and geographic contexts. Due to the wide variation in research designs and instruments across studies, this study did not employ quantitative meta-analysis, but instead emphasized the depth of conceptual interpretation and integration of empirical findings.

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Validity and Credibility

To ensure the validity and credibility of the study results, this study used a clearly documented search protocol and applied consistent selection criteria. Only articles with clear methodologies and validated instruments were included in the final synthesis. Furthermore, all selection stages were documented following the PRISMA standard to minimize selection bias and enhance research transparency.

Results and Discussion

Based on the selection and synthesis of reputable international articles using the PRISMA approach, a consistent pattern of findings was obtained regarding the determinants of lecturer innovativeness in higher education. The analysis was conducted thematically and integratively to identify direct and indirect relationships, as well as mediating and moderating roles between variables. In general, the research results indicate that lecturer innovativeness is a multidimensional construct formed through the interaction of competency, psychological, and organizational factors.

Information Technology Literacy as the Foundation of Lecturer Innovation

The transformation of higher education in the last decade has been marked by accelerated digitalization, the integration of artificial intelligence, hybrid learning, and the expansion of online learning ecosystems. In this context, lecturers' information technology literacy is no longer understood simply as technical skills, but as a strategic competency that determines the innovative capacity of individuals and institutions. The synthesis of these findings indicates that lecturers with high levels of digital literacy are more adaptable to pedagogical changes, more creative in designing technology-based learning, and more open to methodological experimentation.

The synthesis also shows that information technology literacy is a key foundation for fostering lecturer innovation. Lecturers with high digital competency are not only able to use technology as a tool but also to creatively integrate it into learning design, evaluation, and academic collaboration. Technological literacy expands the scope for pedagogical exploration and enables lecturers to experiment with digital-based learning

methods, blended learning, flipped classrooms, and the integration of artificial intelligence into teaching.

Furthermore, technological literacy has been proven to improve lecturers' readiness to face changes in the increasingly digitalized higher education ecosystem. Digital transformation is no longer optional but has become a systemic necessity. In this context, technological literacy acts as an innovation enabler, opening up opportunities for the emergence of new ideas, approaches, and learning strategies. Without adequate technological literacy, the potential for innovation tends to be hampered by resistance, lack of confidence, and limited technical competence.

These findings align with research in Computers & Education, The Internet and Higher Education, and Educational Technology Research and Development, which shows that lecturers' digital competence is significantly correlated with pedagogical innovation and instructional redesign (Cabero-Almenara et al., 2021; Redecker, 2021; Bond et al., 2023). These studies emphasize that digital literacy functions as an enabling capability that expands the space for innovation in curriculum and assessment. Furthermore, recent analyses have shown that the integration of AI-based technologies and data analytics strengthens learning differentiation and improves the quality of students' learning experiences (Zawacki-Richter et al., 2022; Crompton & Burke, 2023). Thus, technological literacy in contemporary higher education can be positioned as a dynamic individual capability that enables lecturers to respond to digital disruption innovatively and sustainably.

Self-Efficacy as a Psychological Driver of Innovative Behavior

Findings indicate that self-efficacy plays a significant role in driving lecturer innovation. Self-efficacy shapes an individual's belief in their ability to design, implement, and evaluate innovations in teaching and research. Lecturers with high levels of self-efficacy tend to be more resilient to challenges, more open to change, and more willing to take academic risks. Self-efficacy has been shown to act as a psychological mechanism that converts technological literacy into concrete innovative actions. Recent research shows that digital self-efficacy and instructional self-efficacy have a significant influence on willingness to innovate, especially in the context of online and hybrid learning (Liu et al., 2022; Pan & Franklin, 2023).

Self-efficacy serves as a mediator between technological literacy and innovativeness. This means that high digital competence will be more effective in generating innovation when supported by strong self-confidence. Conversely, technological literacy without adequate self-efficacy does not always lead to innovative action. Self-efficacy transforms competence into concrete action. Thus, this psychological factor serves as a crucial bridge between capacity and innovation implementation.

In a longitudinal study published in *Teaching and Teacher Education*, self-efficacy was found to increase persistence, risk-taking behavior, and experimentation in pedagogical innovation (Fackler & Malmberg, 2022). This confirms that competence without self-confidence does not automatically lead to innovation. Self-efficacy shapes perceptions of control and preparedness for uncertainty, which are inherent characteristics of the innovation process. A recent meta-analysis showed that self-efficacy acts as a significant mediator between professional development and innovative teaching behavior (Thurm & Barzel, 2022). This means that technological literacy training is only effective if accompanied by strengthening lecturers' professional self-confidence. Thus, self-efficacy is not simply an additional psychological variable but a central mechanism in the model of lecturers' determinants of innovativeness.

Achievement Motivation as Internal Energy for Innovation

Achievement motivation has been found to be an intrinsic factor that strengthens lecturers' innovative orientation. Lecturers with high achievement motivation tend to set higher performance standards, seek academic challenges, and actively participate in

publications and creative learning development. This motivation encourages individuals to not only maintain routine practices but also to continuously seek improvements and innovations. Research shows that achievement-oriented academics are more proactive in generating pedagogical innovations and scientific publications (Jansen et al., 2022; Li & Wang, 2023).

Research synthesis shows that achievement motivation strengthens the relationship between self-efficacy and innovativeness. Lecturers who are confident in their abilities and possess a strong drive to achieve tend to produce more consistent and sustainable innovations. Achievement motivation also contributes to increased research productivity and academic collaboration, ultimately enriching innovative practices within the institution. Thus, innovation is not simply a matter of competence or systems, but is also closely related to the internal drive to excel and achieve higher academic standards.

In the post-pandemic context of higher education, intrinsic motivation has been shown to be a strong predictor of creative teaching performance and knowledge creation (Han & Ellis, 2023). A study in *Studies in Higher Education* showed that lecturers with a high achievement orientation tend to continuously improve their teaching practices and research collaborations (Tight, 2022). This analysis demonstrates that achievement motivation strengthens the relationship between self-efficacy and innovative behavior. When lecturers are confident in their abilities and have a strong drive to achieve high academic standards, innovation becomes part of their professional identity, not simply a situational response.

Knowledge Management as an Innovation Supporting Ecosystem

Lecturer innovation is also significantly influenced by the knowledge management ecosystem in higher education. Recent studies have shown that knowledge sharing, collaborative culture, and organizational learning climate accelerate the diffusion of academic innovation (Santoro et al., 2021; Secundo et al., 2023). The synthesis of these findings suggests that knowledge management serves as a contextual factor that strengthens and sustains lecturer innovation. Knowledge sharing practices, cross-disciplinary collaboration, documentation of best practices, and institutional knowledge storage systems create an ecosystem conducive to innovation growth.

Other research also confirms that institutions that develop digital knowledge repositories, communities of practice, and interdisciplinary collaborations have higher levels of pedagogical innovation (Massaro et al., 2022). Knowledge management strengthens the transfer of innovative ideas from the individual to the organizational level, preventing sporadic innovation. Knowledge management enables innovative ideas to spread and replicate within the organization, not just at the individual level. A culture of knowledge sharing enhances collective learning and accelerates the diffusion of innovation. Furthermore, a robust knowledge management system enriches sources of inspiration and strengthens the adaptive capacity of higher education institutions.

Conceptually, knowledge management acts as a moderating variable that strengthens the influence of technological literacy, self-efficacy, and achievement motivation on innovation. Without the support of a collaborative organizational system, innovation tends to be sporadic and unsustainable. Meanwhile, from a contemporary perspective, knowledge management is understood as an innovation infrastructure based on organizational learning. With the support of a knowledge-sharing culture and a strong documentation system, the influence of technological literacy, self-efficacy, and achievement motivation on innovation becomes more sustainable.

Conceptual Model of Synthesis of Determinants of Lecturer Innovativeness

The integration of all findings yields a conceptual model demonstrating that lecturer innovation is shaped through a dynamic interaction between individual and organizational factors. Technological literacy strengthens self-efficacy; self-efficacy enhances achievement motivation; achievement motivation drives innovative actions;

while knowledge management strengthens and maintains the sustainability of these processes.

The synthesis of the discussion shows that lecturer innovation is the result of a multidimensional interaction between digital capabilities, psychological factors, intrinsic motivation, and organizational support. Recent literature emphasizes that innovation in higher education requires a systemic and ecosystem-based approach (OECD, 2022; Bond et al., 2023).

This model emphasizes that strategies to increase lecturer innovation must be implemented simultaneously and systematically. A partial approach, such as the research findings that suggest only increasing technology training without considering psychological and organizational cultural aspects, will not yield optimal results. Lecturer innovation is the result of an orchestration of competence, self-confidence, drive to achieve, and support from institutional knowledge systems.

Conclusion

Based on the synthesis of findings and discussion, it can be concluded that lecturer innovation in higher education is the result of a dynamic interaction between information technology literacy, self-efficacy, achievement motivation, and institutional knowledge management support. Technological literacy serves as the foundation of capabilities that enable lecturers to respond creatively to digital transformation. However, these competencies will only actualize into innovation if supported by strong self-efficacy as a psychological mechanism that encourages the courage to experiment and face the risks of change. Achievement motivation then strengthens the consistency of innovative behavior, making innovation part of the lecturer's professional identity, not merely a situational response. Furthermore, knowledge management functions as a supporting ecosystem that ensures innovation does not stop at the individual level, but is documented, shared, and replicated within the organization.

The results of this study confirm that academic innovation cannot be explained in isolation but rather needs to be understood as an orchestration of digital competence, psychological capacity, intrinsic motivation, and institutional knowledge culture. Practically, universities need to design a systemic lecturer development strategy. Institutions that can synergize these four determinants have the potential to create a culture of sustainable innovation and increase global competitiveness. Therefore, lecturer innovation is not merely an individual development issue, but a strategic agenda in higher education reform that adapts to technological change and global dynamics.

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