

Digital Technology Adoption in University-Level Economics Teaching: Rogers' Diffusion of Innovation Theory

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Abstract

This systematic review, guided by Rogers' Diffusion of Innovation (DOI) theory, examines the adoption of digital technologies in university-level economics teaching. While the COVID-19 pandemic accelerated the shift to digital education, a significant gap remains in understanding the factors that influence the sustained adoption of these innovations among educators. The study synthesizes literature from 2015 to 2025, using a PRISMA-compliant methodology to analyze empirical and conceptual studies. The review focuses on how key attributes of the innovation, i.e. relative advantage, compatibility, complexity, trialability, and observability affect the adoption process. Findings reveal a dual landscape: while educators and students recognize the substantial relative advantage of digital tools in enhancing engagement and critical thinking, their widespread adoption is hindered by significant barriers. These include a lack of resources and infrastructure, which creates a compatibility issue, and insufficient digital skills among teachers, increasing the perceived complexity. This systematic analysis underscores that the diffusion of digital teaching in economics is not just a technological issue but a social and pedagogical one. This study concludes by recommending that future efforts should move beyond simply providing technology to focus on targeted teacher training and institutional support. This approach would address the complexity and compatibility challenges, thereby accelerating the adoption of digital innovations in economics education and ensuring a more effective and equitable learning environment.

Keywords: Digitalization, Economics Education, Diffusion of Innovation Theory, ICT, Teacher Training, Higher Education

Introduction

The COVID-19 pandemic catalyzed an unprecedented acceleration in the digitalization of higher education, with universities worldwide rapidly adopting online and blended teaching modalities (Arshad, 2020; Cone et al., 2021). Research shows that the volume of publications on digital transformation in higher education surged beginning in 2020 and continued through 2021, marking a relatively immature but fast-growing field of study. In the domain of economics teaching, recent systematic reviews (Joshi & Koirala, 2023) underscore that digital resources including e-learning platforms, simulations, and flipped classroom strategies enhance engagement, bridge theory-practice gaps, and improve accessibility, though barriers such as inequitable technology access and pedagogical design remain pervasive. Despite this momentum, most academicians in economics have focused on descriptions of tools or pedagogical strategies, with limited attention to mechanisms explaining how and why adoption occurs among instructors and institutions. Thus, there is a pressing need to anchor such inquiry in a robust theoretical framework.

DOI theory remains a foundational lens for understanding the adoption process of new technologies and practices. DOI outlines five key stages Knowledge, Persuasion, Decision, Implementation, and Confirmation and describes how innovation attributes (relative advantage, compatibility, complexity, trialability and observability) influence adoption rates across adopter categories (innovators, early adopters, early majority, late majority, laggards). DOI has been extensively applied to educational settings, such as the adoption of mobile learning and online proctored exams during the pandemic era, demonstrating how uncertainty reduction, reinvention, and peer modeling critically shape educator uptake (Rogers, 2003). For example, Frei-Landau et al. (2022) and Moya and Camacho (2021) deployed DOI to analyze teacher adoption of mobile learning tools, identifying that sufficient how-to knowledge and opportunities for adaptation (reinvention) significantly increase sustained usage. Similarly, faculty adoption of online teaching during the COVID-19 pandemic was explicitly studied through the DOI lens, revealing that the enforced innovation (emergency remote teaching) offered important insights into drivers and inhibitors of sustained adoption beyond crisis conditions.

Economics as a discipline relies heavily on abstract modeling, quantitative data interpretation, and dynamic systems thinking. Digital technologies such as simulations (e.g.,

supply demand or game theory simulators), data visualization tools, real-time economic dashboards, and interactive platforms offer significant potential to concretize complex concepts, enhance interactivity, and improve learning outcomes (Roberts & Williams, 2017; Turner & Harris, 2022). DOI provides a structured theoretical lens to assess how instructors perceive these innovations in terms of: Relative advantage, assessing educators' beliefs about whether digital tools add demonstrable value over traditional lectures and problem-sets (Frei-Landau et al., 2022). Compatibility, exploring alignment with economists' pedagogical beliefs and course designs. Complexity, addressing both usability of technologies and instructors' digital confidence. Trialability, examining access to pilot projects, workshops, and opportunities for experimenting with new tools. Observability, considering how visible positive outcomes influence peer adoption within departments. Moreover, DOI's adopter categories provide insight into institutional dynamics why some economics educators lead digital transformation while others lag behind.

Joshi & Koirala (2023) systematic review synthesized 17 high-quality studies on digital economics teaching. Findings emphasize that while digital tools (e-learning platforms, simulation modules, flipped classrooms) are widely used to enhance engagement and real-world linkage, persistent challenges remain in equitable access, instructor presence, and effective pedagogical design. In higher education broadly, studies also confirm that digital transformation is not purely technological but deeply social: institutional leadership, strategic alignment, and reflective action research among faculty are central to successful integration of innovation. Yulin and Danso (2025) further highlight that while many educators recognize digital tools' benefits, barriers like inadequate training and resistance to change undermine pedagogical readiness pointing to a critical need for focused professional development and institutional policy frameworks.

Purpose of the Study

The study aims to investigate the influence of different adopter categories ranging from innovators and early adopters to the early majority, late majority, and laggards on the diffusion of digital innovations within economics departments. One of the central objectives of this study is to explore how faculty members and institutions adopt digital technologies in economics teaching by examining their experiences through the five key attributes outlined in Rogers'

Diffusion of Innovation (DOI) theory. These include the perceived relative advantage of digital tools in enhancing teaching and learning outcomes, their compatibility with existing pedagogical practices, the complexity or simplicity associated with their use, the opportunities for trial and experimentation before full-scale adoption, and the visibility of successful implementation across the academic environment.

Research Questions

The study is guided by two research questions.

1. How do social dynamics, peer influence, and institutional culture facilitate or hinder the widespread adoption of digital teaching practices in economics teaching?
2. How do perceived relative advantage, compatibility with existing pedagogical practices, complexity, trialability, and observability influence the adoption of digital tools in teaching and learning?

Methods and Materials

This study employs a rigorous and transparent methodological approach to explore how digital technologies have been integrated into university-level economics teaching through the theoretical lens of Rogers' DOI theory. In adherence to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, each stage of the review process was designed to ensure methodological clarity, replicability, and credibility. The review focuses on literature published between 2015 and 2025, encompassing both the pre-pandemic period characterized by gradual digital integration and the post-COVID era marked by rapid digital acceleration. This ten-year window allows for a nuanced understanding of how digital pedagogies in economics education have evolved over time.

To maintain the quality and relevance of the review, only empirical and conceptual studies were included that met specific criteria: they had to be peer-reviewed journal articles or doctoral theses/dissertations published in English within the defined timeframe. The studies also needed to focus explicitly on university-level economics instruction and address aspects of digital or ICT use. Studies merely referring to general digital education without a direct focus on

economics teaching, as well as grey literature, book chapters, and conference abstracts, were excluded to preserve academic rigor.

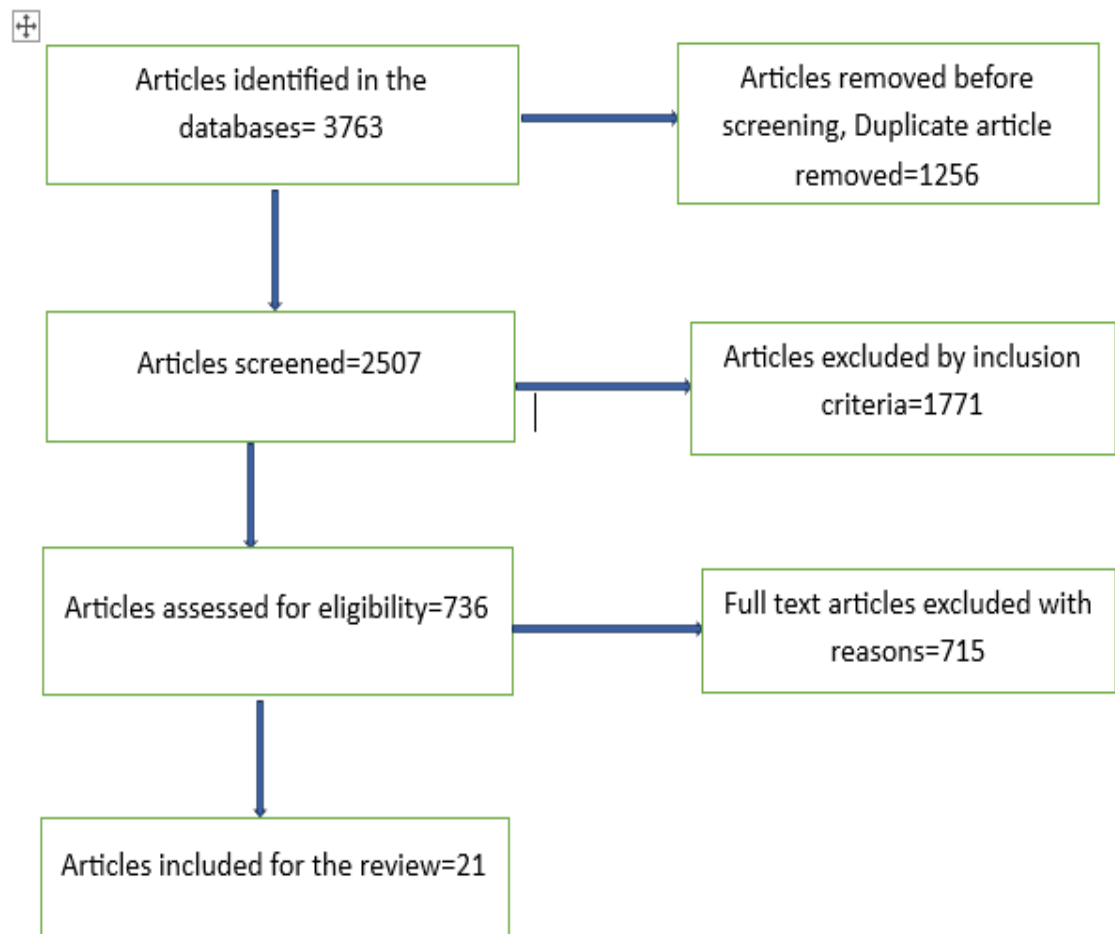
The literature search was conducted systematically using four prominent databases: Scopus, Web of Science, ERIC, and Google Scholar. A combination of Boolean operators and targeted keywords guided the search strategy, including terms such as “digital technology,” “economics teaching,” “university,” “higher education,” “adoption,” “integration,” “innovation,” and “Diffusion of Innovation.” The initial search results were imported into reference management software Endnote to facilitate duplicate removal and streamline the review process. A two-step screening process was then applied. In the first step, titles and abstracts were reviewed to eliminate irrelevant studies. In the second step, the full texts of the remaining articles were assessed to determine their eligibility based on the predefined inclusion criteria. The overall process was documented using the PRISMA 2020 flow diagram, ensuring transparency in the identification, screening, eligibility, and inclusion phases.

For each study that met the inclusion criteria, a structured data extraction form was used to collect essential information. This included the author(s)’ year of publication, country or regional context, research objectives, methodological approach, types of digital technology used, target, and key findings related to technology adoption, resistance, and educational outcomes. All extracted data were then organized and imported into qualitative analysis software Atlas.ti.

A thematic synthesis approach was employed to analyze the data, combining both inductive and deductive coding processes. While the synthesis was open to emerging patterns and contextual insights, it was primarily structured around the five core attributes of DOI theory: relative advantage, compatibility, complexity, trialability, and observability. Specifically, studies were examined to understand how economics educators perceived the benefits of digital tools, whether these tools aligned with traditional pedagogical approaches, the ease or difficulty of their use, the extent to which they could be piloted, and the visibility of successful implementations. Furthermore, the review explored the classification of adopters into Rogers’ five categories innovators, early adopters, early majority, late majority, and laggards based on the timing and nature of digital technology uptake. This helped to shed light on the social and institutional factors that influence the diffusion process within economics departments.

Although the primary aim of this study was to synthesize thematic findings, a basic quality assessment was also performed to ensure the robustness of the included literature. Each study was evaluated for the clarity of its research objectives, the appropriateness of its methodology, the transparency of its data collection and analysis procedures, and its relevance to the review's central focus on digital technology adoption in economics education. Studies that lacked methodological rigor, failed to report key information, or fell outside the thematic scope were excluded from the final synthesis. Overall, this systematic approach allowed for a comprehensive and theory-informed understanding of the patterns, challenges, and enablers of digital innovation in university-level economics teaching.

Figure 1. *PRISMA flow diagram of literature retrieval*



Review of Literatures of Digitalizing Economics Teaching

Pahrudin et al. (2016) indicates that various facets of teacher competence significantly contribute to student achievement in Economics in East Lombok. Specifically, pedagogical competence directly enhances student achievement by 18.7%, while personality competence demonstrates a direct positive effect of 26%. Professional competence exhibits the most substantial direct impact, accounting for a 30.8% increase in student achievement. Furthermore, social competence directly influences student outcomes by 28.8%. Beyond these direct effects, professional competence also mediates indirect influences from other competencies: pedagogical competence (0.074), personal competence (0.082), and social competence (0.158). Collectively, these findings underscore the substantial and multifaceted role of teacher competencies in fostering improved learning outcomes among students.

The research done by Akhmetshin et al. (2018) reveals a decrease in professional training quality due to increased distance learning and electronic resources usage. It highlights the necessity of integrating higher education with business on a digital basis.

The pervasive influence of digitalization on the educational sector has introduced significant uncertainties regarding the future of e-learning, eliciting divergent perspectives among stakeholders found by Laaser (2018). While some maintain an optimistic outlook, others express considerable skepticism concerning the efficacy and appropriate role of digital media in pedagogical practices. This evolving landscape necessitates a robust discussion on the economic implications of digital educational resources, specifically their multifaceted effects on teachers, students, and institutions. Furthermore, the sustainability of Massive Open Online Courses (MOOCs) is critiqued, with concerns raised that their continued viability in competitive educational markets may be contingent upon dedicated external funding. Finally, the research identifies potential negative repercussions of digitalization on critical aspects such as social interaction and student engagement, highlighting areas for careful consideration in the ongoing integration of technology into education.

Nji and Idika (2018) aimed to assess the extent of Information and Communication Technology (ICT) utilization in the teaching and learning of Economics within the Nsukka education zone. Findings revealed a generally low level of ICT integration among both students

and teachers. While students demonstrated moderate engagement with ICT for classroom assignments, suggesting a nascent positive disposition towards digital tools, overall utilization remained subdued. Notably, no significant disparity in ICT utilization was observed between male and female teachers or students. Teachers predominantly employed ICT for content presentation and deductive analysis in Economics instruction. A significant contributing factor to the limited ICT adoption was the prevalent challenges related to the availability of essential ICT tools and reliable internet facilities. Consequently, the study recommends enhancing ICT training programs for educators and providing improved technological infrastructure and internet connectivity within schools to foster greater integration of ICT into Economics education.

Students involved in the study of Arthur and Kaku (2020) generally displayed a positive attitude toward incorporating technology into Economics education, recognizing the effectiveness of tools such as computers, presentation software, and projectors for teaching the subject. However, a significant finding was the infrequent adoption of these available technologies by Economics teachers in their teaching practices. Interestingly, no substantial difference was observed in students' perspectives on technology use based on gender. To bridge this gap, the study recommended providing training for teachers to improve their technological proficiency and encourage greater integration of technology in their classrooms.

Findings of Agasisti et al. (2020) suggest a consistent negative association, indicating that intense home ICT use for homework is linked to lower test scores across various subjects. This negative impact was observed to be slightly more pronounced for students from high socio-economic status (SES) backgrounds. It is posited that socio-economically advantaged students, despite potentially having better resources and peer support to leverage ICT, may also experience more significant distractions or misuse, contributing to this outcome. Consequently, the study advocates for a cautious approach to incorporating digital tools into homework assignments. Furthermore, it emphasizes the critical importance of robust teacher training to ensure the effective and pedagogically sound integration of ICT into overall educational strategies.

Study of Expósito et al. (2020) provides empirical evidence concerning the efficacy of instructional videos in facilitating the learning of macroeconomic concepts. Specifically, the research involved the development and subsequent testing of videos designed to illustrate dynamic macroeconomic processes among student cohorts at the University of Seville. To

thoroughly assess the impact of these videos on academic performance, variables such as gender and prior knowledge were analyzed in relation to students' test scores. The findings conclusively demonstrate that the integration of instructional video clips significantly enhances students' performance on tests, suggesting their value as a pedagogical tool in higher education.

The study of Bansa (2020) explores the perceptions, challenges, and expectations of lecturers regarding the use of ICT in teaching economics. While most lecturers view ICT positively, a key finding is that they often struggle with a limited understanding and knowledge of how to effectively integrate these tools into their teaching. A strong desire emerged from the respondents for more interactive classes and practical knowledge, which they believe can be achieved through increased computer use. The insights from this study are intended to help educators more effectively incorporate ICT into their teaching methods and overcome the existing obstacles.

Study of Hendriarto and Review (2021) examines the transformative influence of digitalization on business operating models within Indonesia, drawing insights primarily from economic and business journals. The analysis consistently demonstrates that digitalization significantly enhances business operations, enabling enterprises to overcome challenges, particularly during periods of crisis and widespread disruptions such as the recent pandemic. A key finding is the critical role of digital services across all phases of business including production, distribution, and sales in fostering long-term business sustainability. Furthermore, digitalization has been shown to markedly improve service efficiency across all operational lines, directly contributing to the achievement of profitable business objectives. The research ultimately underscores the imperative for both companies and consumers to proactively adapt to ongoing technological advancements to remain competitive and thrive in the evolving digital landscape.

UGWU and Ogbu (2021) conducted descriptive survey research design to explore the perceptions of economics teachers in Nigeria regarding distance and e-learning, which became prevalent due to COVID-19 school closures. The study involved 69 economics teachers from 59 public secondary schools and revealed a negative perception of distance and e-learning education among the participants. The findings from this study are intended to inform stakeholders and guide necessary actions for future e-learning implementation.

A study by Kimanzi (2021) on the use of Information and Communication Technology (ICT) in teaching Economic and Management Sciences (EMS) subjects revealed that most teachers are already integrating these tools into their lessons. However, the study also found that this integration is often hindered by a significant lack of resources in schools. To address this issue, it's recommended that teacher training be improved to better equip educators with the skills needed for effective ICT adoption. The study's key recommendations include providing teachers with basic ICT training and increasing funding to ensure schools have the necessary resources.

A study conducted in Nepal by Joshi (2022) examined the relationship between the demographic characteristics of economics teachers and their use of ICT in the classroom. The research, which utilized a quantitative case study approach with data gathered through structured interviews, emphasized the crucial role of teachers' skills in content, pedagogy, and technology for achieving positive educational outcomes. The findings indicate that teachers' demographic features, such as gender, qualifications, and teaching experience, significantly influence their application of ICT in teaching. This highlights the necessity for economics teachers in the 21st century to be technologically competent.

Research conducted by Dečman and Rep (2022) has revealed that both university and high-school students demonstrate below-intermediate levels of digital competencies. Interestingly, high-school students exhibited a higher self-assessment of their digital skills compared to their university counterparts. Within the university cohort, an upward trend in digital competencies was observed with increasing years of study. The widespread adoption of digital tools in education, largely catalyzed by the recent pandemic, has contributed to an improvement in individual digital competencies. However, discrepancies were noted in e-learning preferences between students and educators. These findings collectively underscore a critical need for pedagogical enhancements aimed at fostering robust digital competencies, particularly given their paramount importance within the domain of economic education for the effective implementation of these tools in their teaching practices.

In a study conducted in Abia State by Ede and Nwaogazie (2022), descriptive survey research design was used to analyze how economics teachers integrate e-teaching into their classrooms. The study's population consisted of 234 economics teachers, from which a sample of

87 was selected. Data was collected using a 40-item questionnaire that demonstrated high reliability with a Cronbach alpha of 0.89. The key findings indicated that the integration of e-teaching significantly enhances collaboration, motivation, and enjoyment among students. Based on these results, the study recommended that the government organize workshops to better prepare teachers for the effective implementation of e-teaching.

In a study exploring the use of Information and Communication Technology (ICT) in economics education by Adu and Zondo (2023), educators expressed a generally positive view. They see ICT as a tool that enhances teaching by making lessons more engaging and easier for students to understand. The study found that using ICT can improve student academic performance and critical thinking skills while also helping teachers save time and keep their curriculum current. However, significant challenges hinder its widespread use, including a lack of necessary resources like computers and reliable internet, and inadequate teacher training. Some teachers also lack confidence or fear technology, and there are concerns about students misusing gadgets. To fully realize the potential of ICT, these barriers related to infrastructure, teacher skills, and effective policy need to be addressed.

Joshi (2023) investigates the use of Information and Communication Technology (ICT) in teaching economics at the university level. It explores the perceptions of teachers and the challenges they face in the classroom. Employing a phenomenological design, the research gathered qualitative insights from five participants at Mahendra Ratna Campus. The findings reveal a keen interest among economics teachers in using ICT as a necessary educational tool. However, despite this strong interest, teachers still encounter significant obstacles that hinder the

The paper of Різник (2024) introduces a model designed to cultivate critical thinking in aspiring economists, particularly within the context of increasing digitalization. The model primarily focuses on improving individual thinking characteristics through various analytical activities. It integrates both general didactic principles and specific principles tailored for effective learning. Statistical analysis of the model's implementation demonstrated significant improvements in critical thinking levels among students in the experimental group.

Manzi and Moreeng (2024) found that while teachers are using Information and Communication Technology (ICT) to enhance their Economics lessons, there is a clear need for improvement in integration practices. The research highlighted a significant lack of ICT

integration, attributing this to insufficient Technological Pedagogical Content Knowledge (TPACK) among teachers. To address these issues, the study recommends continuous professional development for teachers on ICT integration to improve the implementation of the Economics curriculum. Additionally, it emphasizes the need for increased funding to acquire the necessary ICT resources for effective teaching.

A Lense of Diffusion of Innovation Theory: Digitalize Economics Teaching

The research by Harsoyo (2016) examines the adoption of ICT in economics instruction and the various factors that influence this process. Utilizing a mixed-method approach, the study combined both qualitative and quantitative data to identify key variables. The findings indicate that the adoption of ICT is significantly influenced by factors such as voluntariness, its perceived relative advantage, and its ease of use. Additionally, environmental factors, particularly social influence, were found to play a crucial role. Affective variables, such as a teacher's feelings of liking and interest, are also important in the adoption process. Interestingly, the study found that demographic variables have no significant influence on the adoption of ICT

Using Rogers' Diffusion of Innovation theory, Menzli et al. (2022) investigates the adoption of Open Educational Resources (OER) in higher education. The findings indicate that the perceived relative advantage of OER has a positive impact on its adoption, while factors such as observability and complexity also play significant roles. The study's conclusions highlight the need for increased OER initiatives that specifically address and mitigate challenges related to trialability, complexity, and compatibility to encourage broader adoption among faculty.

A study of Wang et al. (2023) suggests a need for a deeper integration of technology and education. It emphasizes that technological innovation has the potential to significantly change educational methods and practices. The research points out a lack of macro-level discussions on this topic and proposes using the diffusion of innovation theory to analyze the current state and results of digital transformation in education. The study concludes that this theoretical framework could be a valuable guide for advancing digital education in China, and it recommends that future research should empirically test this theory in the context of digital education transformation.

Table 1. *Detail Information of Reviewed Studies*

Authors	Years	Methods/Design	Remarks
(Harsoyo, 2016)	2016	Mixed Method Research	
(Pahrudin et al., 2016)	2016	Quantitative/Survey	
(Akhmetshin et al., 2018)	2018	Quantitative	
(Laaser, 2018)	2018	Not t a specific methodology	
(Nji & Idika, 2018)	2018	Quantitative/ Survey	
(Agasisti et al., 2020)	2020	Econometric techniques	
(Arthur & Kaku, 2020)	2020	Quantitative/ Survey	
(Bansa, 2020)	2020	Qualitative	
(Expósito et al., 2020)	2020	Quantitative/Experimental	
(Hendriarto & Review, 2021)	2021	Qualitative/Descriptive	
(Kimanzi, 2021)	2021	Quantitative	
(UGWU & Ogbu, 2021)	2021	Quantitative/ Survey	
(Dečman & Rep, 2022)	2022	Quantitative/Survey	
(Ede & Nwaogazie, 2022)	2022	Quantitative/ Survey	
(Joshi, 2022)	2022	Quantitative/Survey	
(Menzli et al., 2022)	2022	Quantitative/Descriptive	
(Adu & Zondo, 2023)	2023	Qualitative/Case study	
(Joshi, 2023)	2023	Qualitative/Phenomenology	
(Wang et al., 2023)	2023	Bass Diffusion Model	
(Manzi & Moreeng, 2024)	2024	Qualitative	
(Різник, 2024)	2024	Quantitative / Qualitative	

Result and Discussion

Based on the literature reviewed, the digitalization of economics teaching presents a complex landscape best understood through the lens of the Diffusion of Innovation (DOI) theory. The reviewed studies collectively reveal that while the relative advantage of ICT in economics education is widely recognized by both educators and students, its widespread adoption is consistently hindered by significant challenges related to complexity, compatibility, and trialability.

The perceived benefits of digital tools are a primary driver for adoption. Expósito et al. (2020) demonstrated the effectiveness of instructional videos in enhancing student performance in macroeconomics, while Adu and Zondo (2023) highlighted how educators view ICT as a tool for making lessons more engaging, improving student performance, and fostering critical thinking. This is further supported by Ede and Nwaogazie (2022), who found that e-teaching boosts student collaboration and motivation. These findings align with Harsoyo (2016) research identified relative advantage and social influence as key motivators for ICT adoption among teachers. Furthermore, the positive attitudes of students, as noted by Arthur and Kaku (2020) reinforce the idea that the "relative advantage" of digital tools is well-understood by the end-users of the innovation.

However, the path to full-scale adoption is fraught with barriers. A recurring theme in the literature is the lack of resources and inadequate infrastructure in schools, as noted by Kimanzi (2021) and Adu and Zondo (2023). This lack of access to essential ICT tools and reliable internet, as identified by Nji and Idika (2018), creates a significant "compatibility" issue. The innovation simply cannot be effectively integrated into the existing educational environment. Additionally, a critical impediment is the "complexity" of the innovation and the corresponding lack of teacher digital competency. Studies by Bansa (2020), Joshi (2023) and Manzi and Moreeng (2024) all emphasize that while teachers have a positive attitude toward ICT, they lack the foundational knowledge and skills to integrate it effectively. This is particularly problematic, as professional competence is a major predictor of student achievement (Pahrudin et al., 2016). The negative perception of e-learning by some teachers, as found by UGWU and Ogbu (2021), may also stem from this lack of confidence and training, making the innovation seem more complex than it is.

The literature also presents conflicting findings on the impact of digitalization, which is a key aspect of the diffusion process. For example, while Hendriarto and Review (2021) showed the positive transformative influence of digitalization on business models, Akhmetshin et al. (2018) raised concerns about a decline in professional training quality due to distance learning. Similarly, the study by Agasisti et al. (2020) offered a cautionary note, suggesting a negative correlation between intensive home ICT use for homework and lower test scores. This highlights the need for a more nuanced approach to implementation, where a focus on effective pedagogy

and teacher training, as recommended by Laaser (2018), is crucial to mitigate potential drawbacks.

The findings align closely with the tenets of Rogers' DOI theory. While the perceived relative advantage of digitalizing economics teaching is high, a series of systemic and individual barriers including a lack of resources, insufficient teacher training, and a consequent low level of technological pedagogical content knowledge (TPACK) among educators—have slowed the diffusion process. The recommendations across the studies consistently point to the need for targeted interventions. To accelerate the adoption of digital tools, it is imperative to move beyond simply providing technology and focus on developing teachers' digital competencies (Joshi, 2022; Manzi & Moreeng, 2024). This includes basic ICT training for all educators and increased funding to create a compatible and supportive environment, thereby transforming the "complexity" of the innovation into an accessible and effective pedagogical tool. Future research should empirically test these recommendations and explore how change management strategies can mediate the relationship between innovation characteristics and successful implementation within educational institutions.

Conclusion

This systematic review, viewed through the lens of DOI theory, reveals a nuanced picture of digital technology adoption in economics education. While the inherent relative advantage of digital tools for their ability to make complex economic concepts tangible, boost student engagement, and enhance critical thinking is widely acknowledged, their widespread diffusion is far from complete. The literature consistently highlights significant barriers, including a critical lack of resources, insufficient teacher training, and a consequent low level of TPACK. The journey toward fully digitalized economics teaching is a clear example of the diffusion process in action. We see innovators and early adopters embracing new tools and methodologies, but the progress to the early and late majority is stalled by challenges related to compatibility (lack of institutional resources) and complexity (insufficient teacher skills). The findings underscore that simply making technology available is not enough. For innovation to diffuse successfully, institutions must invest in robust infrastructure and, more importantly, in the human capital—the educators themselves.

This study provides directions for future research and practice. First, more empirical studies are needed to test the specific impacts of targeted professional development programs on improving teachers' TPACK in economics. Second, research should investigate how institutional policies can effectively incentivize and reward the adoption of digital innovations, potentially through a DOI-informed framework that addresses all five attributes. Finally, exploring the influence of peer networks and departmental leadership as key drivers of observability and social influence could offer valuable insights into accelerating the diffusion process and ensuring that digitalizing economics teaching becomes a sustainable and equitable reality for all.

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