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THE MODERATING ROLE OF INFORMATION TECHNOLOGY IN THE RELATIONSHIP BETWEEN WORK MOTIVATION, LEADERSHIP STYLE, AND LECTURER WORK PRODUCTIVITY IN ISLAMIC HIGHER EDUCATION

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Abstract

This study examines the impact of leadership style, work motivation, and information technology on lecturer productivity in Islamic Higher Education Institutions (IHEIs) in Jambi Province, Indonesia. Using a quantitative research design, data were collected from 237 lecturers through a structured questionnaire, employing proportional stratified random sampling. The study found that leadership style, work motivation, and information technology have a positive and significant effect on lecturer productivity. Additionally, information technology was found to significantly moderate the relationships between work motivation and lecturer productivity, as well as between leadership style and lecturer productivity. The findings highlight the importance of transformational leadership, a motivated workforce, and robust IT infrastructure in enhancing academic performance in IHEIs. The study contributes to the literature by demonstrating how these factors interact to foster lecturer productivity and provides practical recommendations for improving academic excellence in higher education institutions.

Keywords: Leadership Style, Work Motivation, Information Technology, Work Productivity, Islamic Higher Education Institutions, Structural Equation Modeling, Digital Leadership

INTRODUCTION

Islamic Higher Education Institutions (IHEIs) play a strategic role in developing human resources aligned with Islamic values, both nationally and globally. However, challenges faced by IHEIs in Indonesia are substantial, particularly in maintaining and enhancing the work productivity of lecturers as the cornerstone of the Three Pillars of Higher Education (Tri Dharma Perguruan Tinggi). Lecturer work productivity encompasses effective teaching, relevant research output, and contributions to community service. Amid the digital transformation accelerated by the COVID-19

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pandemic, IHEIs are confronted with the reality that lecturers must adapt to information technology to support online learning processes while meeting increasingly complex academic demands. This transformation presents both challenges and opportunities for IHEIs to enhance their competitiveness nationally and internationally (Djunaedi et al., 2023; Rahardja, 2021).

One of the key challenges for IHEIs is how to create a conducive environment for lecturers to remain productive during this transformation. Work motivation, which includes intrinsic factors such as job satisfaction and extrinsic factors like incentives, serves as a critical determinant in supporting lecturer performance. Previous research has shown that lecturer motivation often faces barriers due to a lack of institutional support, both in terms of policy and recognition of achievements (E. L. Deci & Ryan, 1985; Herzberg, 1966). This issue is further exacerbated by increasing administrative burdens and the need to adapt to technology without adequate training. Thus, identifying and strengthening motivational factors among lecturers is essential to ensuring their productivity in the digital era.

In addition to work motivation, leadership style within higher education institutions, particularly IHEIs, significantly influences lecturer productivity. Transformational leadership, which emphasizes vision, inspiration, and individual support, has been proven to enhance engagement and performance among lecturers (B. M. Bass, 1985; Yukl, 2013). However, implementing this leadership style consistently in IHEIs often encounters challenges, especially in institutions with limited resources. These challenges become more pressing as institutional leaders are also expected to ensure the effective adoption of technology, both in terms of infrastructure and lecturer acceptance. Therefore, research on leadership styles that support lecturer productivity in IHEIs becomes highly relevant.

Information technology serves as a central element in supporting lecturer productivity, particularly in online learning. In the context of IHEIs, information technology not only acts as a tool for teaching but also as an instrument to enhance efficiency and effectiveness in lecturers' work. Previous studies indicate that adopting information technology can strengthen the relationship between work motivation and productivity, as well as between leadership style and lecturer performance (Davis, 1989; Venkatesh et al., 2003). However, the adoption of such technologies does not always proceed smoothly, especially in IHEIs facing infrastructure and human resource challenges. Therefore, understanding how information technology can be optimally utilized to enhance lecturer productivity is one of the focuses of this study.

This research aims to analyze the relationship between work motivation, leadership style, and lecturer work productivity in IHEIs, highlighting the moderating role of information technology. Focusing on IHEIs in Indonesia, particularly in Jambi Province, provides important local relevance for understanding the unique dynamics within these institutions. Furthermore, the findings are expected to contribute theoretically to the literature on human resource management and higher education while offering practical recommendations for policymakers in IHEIs to improve lecturer productivity through integrated and technology-based approaches. Hence, this study holds relevance not only for IHEIs but also for other higher education institutions facing similar challenges.

Literature Review

1 Work Productivity

Lecturer work productivity is a key indicator of the success of higher education institutions, particularly in fulfilling the Three Pillars of Higher Education (Tri Dharma Perguruan Tinggi), which encompass teaching, research, and community service. This productivity is not only measured by the number of publications but also by the quality of research and its impact on the academic community and society at large. A study by Utama et al. (Utama et al., 2017) highlighted that the productivity of lecturers in publishing internationally indexed journals, such as those indexed by Scopus and Web of Science (WoS), still needs improvement, influenced by factors such as administrative burdens and limited resources.

Factors influencing lecturer productivity can be categorized into internal and external dimensions. Internal factors include intrinsic motivation, competence, and research skills, while external factors involve institutional support, access to resources, and publication policies. Research (Doğan & Arslan, 2024; Kwiek & Roszka, 2024) revealed that highly productive lecturers tend to maintain their performance throughout their academic careers. This finding emphasizes the importance of continuous professional development and a supportive environment in fostering lecturer productivity.

Additionally, the adoption of information technology plays a significant role in enhancing lecturer productivity. The use of learning management systems and other digital tools can facilitate teaching and research processes when supported by adequate training. Venkatesh et al. (Venkatesh et al., 2003) emphasized that individual acceptance of technology is influenced by perceived ease of use and usefulness, which is relevant in the context of improving lecturer productivity through technology integration.

2. Information Technology

Information technology (IT) has become an integral component of modern education systems, particularly in enhancing the productivity and efficiency of lecturers in higher education. IT tools, such as Learning Management Systems (LMS) and online collaboration platforms, enable lecturers to manage courses, assess students, and conduct research more effectively. According to Venkatesh *et al.* (Venkatesh et al., 2003), the successful adoption of IT in educational contexts largely depends on perceived ease of use and usefulness. This is especially relevant in Islamic Higher Education Institutions (IHEIs), where IT adoption often faces challenges due to limited infrastructure and insufficient digital literacy among faculty members. Recent studies have shown that the integration of IT not only facilitates academic processes but also serves as a means to reduce administrative burdens and improve work-life balance for lecturers (Hero, 2019).

The role of IT becomes even more critical when viewed as a moderating factor that strengthens the relationship between individual motivation, leadership styles, and lecturer work productivity. Research by Venkatesh & Bala (Venkatesh & Bala, 2008) highlighted that IT adoption can amplify the positive effects of transformational leadership and intrinsic motivation on academic performance by streamlining

workflows and enhancing communication efficiency. For IHEIs in Indonesia, IT serves as a strategic tool for addressing challenges related to online learning environments, particularly during the COVID-19 pandemic. By providing digital platforms for teaching and research, institutions can foster greater engagement and productivity among lecturers, making IT a crucial element in the pursuit of academic excellence (Aljehani, 2024; Bakker & Demerouti, 2007; B. , & A. B. Bass, 2004; Peng et al., 2023)

3. Work Motivation

Work motivation plays a crucial role in enhancing the productivity and performance of lecturers, serving as a key driver for fulfilling their academic responsibilities, including teaching, research, and community service. Deci and Ryan's (E. L. , & R. R. M. Deci, 2013a) Self-Determination Theory emphasizes the importance of intrinsic and extrinsic motivation in influencing individual behavior and performance. Intrinsic motivation, such as the desire for personal growth and the satisfaction of contributing to society, is particularly relevant in academic contexts, where lecturers are expected to engage in lifelong learning and innovation. On the other hand, extrinsic motivation, which includes financial incentives, institutional recognition, and career advancement opportunities, has also been shown to significantly impact lecturer engagement and productivity (Herzberg, 1966; Kwiek & Roszka, 2024).

The dual influence of intrinsic and extrinsic motivation becomes particularly significant in the context of Islamic Higher Education Institutions (IHEIs), where lecturers often work in environments that emphasize values-driven contributions to education and community development. Research indicates that a lack of institutional support, such as inadequate incentives and recognition programs, can diminish motivation and, consequently, productivity (Rhoades, 2002). Additionally, the interplay between work motivation and other factors, such as leadership styles and access to technology, further amplifies its impact on lecturer productivity. Transformational leadership, for instance, has been found to foster intrinsic motivation by inspiring lecturers to align their personal goals with institutional objectives (B. M. , & B. B. M. Bass, 1985; Northouse, 2025). Thus, a comprehensive understanding of work motivation, including its intrinsic and extrinsic components, is essential for developing policies and strategies to optimize lecturer performance in IHEIs (E. L. Deci & Ryan, 1985; Northouse, 2025; Schaufeli & Bakker, 2004; Zhao, 2005).

4. Leadership Style

Leadership style plays a pivotal role in shaping the work environment and influencing the productivity of lecturers in higher education institutions. Transformational leadership, in particular, has been widely recognized as an effective approach in academic settings, emphasizing vision, inspiration, and individualized support to enhance employee engagement and performance (B. M. , & B. B. M. Bass, 1985). Leaders with transformational qualities motivate lecturers by aligning their personal goals with institutional objectives, fostering a sense of ownership and commitment to their roles. Recent studies have shown that transformational leadership is positively associated with increased job satisfaction, higher levels of motivation, and improved academic productivity, particularly in research and publication outputs (Kwiek & Roszka, 2024)

In the context of Islamic Higher Education Institutions (IHEIs), leadership style is especially critical, given the dual emphasis on academic excellence and value-driven education. Leaders in these institutions are often expected to embody and promote values that align with the institution's mission, while also navigating challenges such as limited resources and the rapid adoption of technology. Research indicates that transformational leadership can effectively mediate the impact of these challenges by fostering a culture of innovation and collaboration (B. M. , & A. B. J. (Eds.). Bass, 1994; Northouse, 2025). Moreover, effective leaders leverage information technology to support lecturers in achieving their goals, thereby enhancing productivity and overall institutional performance (Owusu-Agyeman, 2021; Papadakis, 2018). Understanding the interplay between leadership style and factors such as motivation and technology is essential for designing strategies to optimize lecturer performance in IHEIs (Bryman, 2007)

5. Hypothesis Model

5.1 Work Motivation and Work Productivity

Work motivation has consistently been identified as a critical factor influencing lecturer work productivity in higher education institutions. Motivation, encompassing intrinsic elements such as self-fulfillment and the desire for knowledge, as well as extrinsic factors like financial rewards and career advancement, plays a significant role in driving lecturers to achieve institutional objectives (E. L. , & R. R. M. Deci, 2013b). Studies in the higher education sector indicate that motivated lecturers are more likely to engage in innovative teaching practices, produce high-quality research, and actively participate in community service (Herzberg, 1966; Kwiek & Roszka, 2024). In the context of Islamic Higher Education Institutions (IHEIs), work motivation becomes even more pivotal, given the dual focus on academic excellence and the integration of Islamic values in teaching and community engagement.

The relationship between work motivation and lecturer work productivity is well-documented in existing literature. Research highlights that lecturers with high levels of motivation demonstrate better time management and output in academic responsibilities, particularly in research and publication (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). Moreover, the integration of motivational policies, such as providing incentives and recognition for outstanding performance, has been shown to enhance productivity (Ryan, 2000). Considering the unique challenges faced by lecturers in IHEIs, such as limited resources and increasing administrative demands, fostering both intrinsic and extrinsic motivation is essential for sustaining productivity levels (Papadakis, 2018). Thus, this study hypothesizes:

H1: *Work motivation has a significant effect on work productivity.*

5.2 Leadership Style and Work Productivity

Leadership style is a significant determinant of lecturer work productivity, as it directly influences the work environment, motivation, and engagement of academic staff. Transformational leadership, in particular, has been highlighted as an effective approach in fostering productivity, as it emphasizes inspiring a shared vision, providing individualized support, and encouraging innovation among team members (Bass, 1985). In the context of higher education institutions, leaders who adopt a transformational style can align the personal goals of lecturers with institutional

objectives, thus driving higher levels of productivity. Research by Kwiek and Roszka (Kwiek & Roszka, 2024) indicates that lecturers under transformational leadership are more likely to engage in high-quality teaching, research, and community service, particularly when provided with clear guidance and adequate resources.

The relationship between leadership style and productivity is further strengthened in Islamic Higher Education Institutions (IHEIs), where leaders are often expected to embody values that align with the institution's mission. Effective leaders in IHEIs not only facilitate a conducive environment for academic activities but also address challenges such as resource constraints and the integration of technology. Transformational leadership, as discussed by Avolio & Yammarino (Avolio, 2013a), has been shown to enhance lecturer productivity by fostering collaboration, promoting professional development, and addressing individual needs. This approach becomes particularly relevant in managing the dual demands of academic excellence and value-based education in IHEIs (Marks & Printy, 2003; Muthuswamy, 2024). Moreover, effective leaders leverage information technology to support lecturers in achieving their goals, thereby enhancing productivity and overall institutional performance (Gang Wang et al., 2011; Mukhopadhyay, 2023; Muthuswamy, 2024). Based on these considerations, this study hypothesizes:

H2: *Leadership style has a significant effect on work productivity.*

5.3 Information Technology and Work Productivity

Information technology (IT) has become a critical enabler of productivity in higher education institutions by streamlining administrative tasks, enhancing teaching methodologies, and supporting research activities. IT tools, such as Learning Management Systems (LMS), online collaboration platforms, and digital libraries, allow lecturers to manage their academic responsibilities more efficiently while fostering innovation in teaching and research. Research by Venkatesh et al. (Venkatesh et al., 2003) emphasizes that the successful adoption of IT is significantly influenced by perceived ease of use and usefulness, which impacts individual acceptance and utilization. In Islamic Higher Education Institutions (IHEIs), where resource constraints and digital literacy challenges are common, IT integration has been shown to mitigate some of these barriers by enhancing access to academic resources and enabling flexible learning environments (Alhazzani, 2020; Sharma & Srivastava, 2019) Thus, this study hypothesizes:

H3: *Information technology has a significant effect on work productivity.*

In addition to its direct impact, IT also acts as a moderating variable that strengthens the relationship between work motivation and lecturer work productivity. Motivated lecturers are more likely to adopt IT tools that facilitate their academic tasks, such as designing engaging course materials, conducting virtual classes, and publishing research. Research suggests that IT enhances the intrinsic motivation of lecturers by simplifying complex tasks and providing them with tools to achieve their academic goals (Venkatesh et al., 2003)(Ali et al., 2022). By serving as a bridge between individual motivation and institutional productivity, IT can amplify the positive effects of motivation on lecturer output (Hosen et al., 2021; Mdarbi et al., 2024). Therefore, this study proposes:

H4: *Information technology moderates the relationship between work motivation and work productivity, strengthening the positive effect.*

Similarly, IT moderates the relationship between leadership style and lecturer work productivity by enabling leaders to implement strategies that support academic excellence. Transformational leaders, for instance, can use IT to provide clear communication, monitor progress, and offer personalized feedback, which are essential for fostering a productive academic environment (Avolio, 2013b). In IHEIs, leaders who effectively integrate IT into institutional processes are better equipped to address challenges related to remote learning and resource allocation. This integration enhances organizational efficiency and strengthens the influence of leadership on lecturer productivity (Dumdum et al., 2013; Fikri, 2021; Suryawan, 2018). Therefore, this study proposes:

H5: *Information technology moderates the relationship between leadership style and work productivity, strengthening the positive effect.*

The research framework is shown in **Figure 1**.

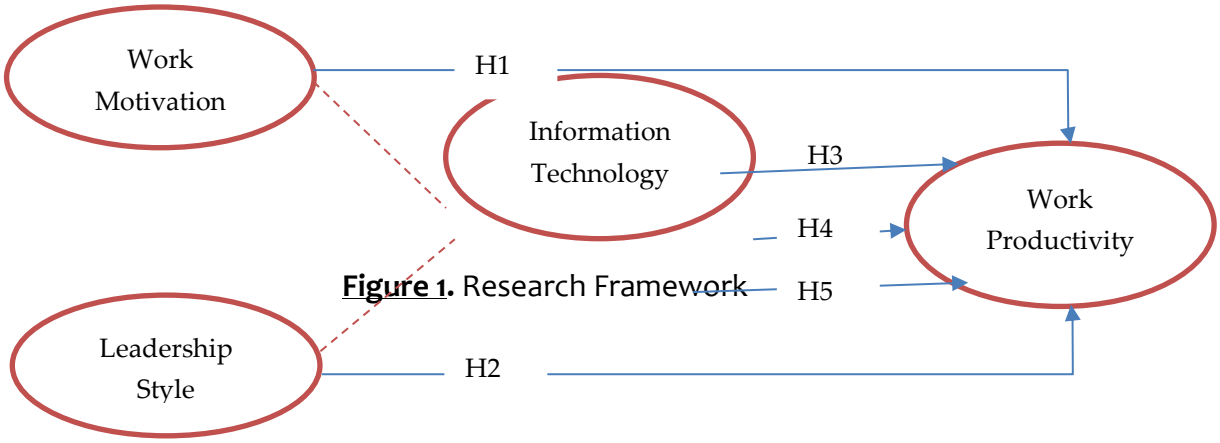


Figure 1. Research Framework

This model was developed by the author, 2025.

RESEARCH METHODS

Samples

The research focuses on lecturers from six Islamic Higher Education Institutions (IHEIs) in Jambi Province, representing diverse institutional contexts and organizational structures. The total population for this study consists of 1,594 lecturers, distributed across six institutions: UIN Sultan Taha Saifuddin Jambi, IAIN Kerinci, Universitas Islam Batang Hari, Institut Agama Islam Tebo, STAI Ma'rif Jambi, and Institut Darul Ulum Sarolangun.

Using the proportional stratified random sampling technique, a total sample size of 237 respondents was determined based on Slovin's formula with a 5% margin of error. The sampling process ensures proportional representation from each institution, providing a comprehensive and balanced perspective of the lecturer population in Jambi Province. This approach enables the study to capture the diverse experiences and characteristics of lecturers across different types of Islamic higher

education institutions, contributing to the reliability and generalizability of the findings.

Profile of Respondents

The respondents for this study comprise **40.9% female** and **59.1% male** lecturers, reflecting a gender distribution that is slightly skewed towards male participants. In terms of age, the majority of respondents are in the 31–40 years age group (43.5%), followed by 41–50 years (23.2%), and those over 50 years (24.5%). Lecturers aged 20–30 years account for a smaller proportion (8.9%), indicating that the majority of respondents are mid-career and senior lecturers with considerable professional experience.

Academic positions among respondents reveal a significant imbalance in rank distribution. 29.5% of the respondents are categorized as "Tenaga Pengajar" (Teaching Staff), which is the entry-level academic position, while 13.5% hold the rank of Assistant Professor (Asisten Ahli). A substantial proportion, 31.2%, are Lecturers (Lektor), followed by 22.4% who are Senior Lecturers (Lektor Kepala). Notably, only 3.4% of respondents have achieved the rank of Professor (Guru Besar), highlighting a stark contrast between entry-level and top-tier academic ranks.

This distribution underscores critical issues within the academic structure of Islamic Higher Education Institutions (IHEIs) in Jambi. The high proportion of "Tenaga Pengajar" indicates that many lecturers remain at entry-level positions without progressing to higher academic ranks. Conversely, the very low percentage of Professors points to a significant gap in achieving top academic positions, which could impact research output, institutional reputation, and overall academic development. These findings suggest the need for targeted interventions, such as career development programs and incentives, to encourage upward mobility among lecturers and address structural imbalances in academic rankings.

Measurement

This study adopts a multidimensional approach to measure variables using validated constructs from prior research. The variables include Leadership Style, assessed through dimensions like Idealized Influence, Inspirational Motivation, Intellectual Stimulation, Individualized Consideration, and Digital Leadership; Work Motivation, categorized into Intrinsic and Extrinsic Motivation; Lecturer Productivity, measured through Work Efficiency, Work Quality, and Work Flexibility; and Information Technology, evaluated based on Technology Infrastructure, Technology Utilization, and Digital Competence. The **Table 1** below details the dimensions, indicators, codes, and references for each variable.

Table 1: Operationalization of Variables

Variable	Indicator	Code
Leadership Style Bass (1985) Avolio, Sosik, & Kahai (2014)	Leaders act as respected role models.	LS1
	Leaders demonstrate integrity in actions.	LS2
	Leaders provide a clear vision and objectives.	LS3
	Leaders motivate the team with inspiring communication.	LS4
	Leaders encourage innovation and creative problem-solving.	LS5

Variable	Indicator	Code
	Leaders are open to new ideas from team members.	LS6
	Leaders address individual needs.	LS7
	Leaders provide personal feedback and guidance.	LS8
	Leaders use technology for communication and decision-making.	LS9
	Leaders build team engagement in digital environments.	LS10
Work Motivation Deci & Ryan (1985, 2017)	Satisfaction in completing tasks.	WM1
	Enjoyment in accomplishing tasks.	WM2
	Interest in specific tasks or activities.	WM3
	Productivity driven by rewards or incentives.	WM4
	Effort to achieve organizational goals due to financial rewards.	WM5
	Response to external pressures, such as evaluations or performance demands.	WM6
Information Technology Davis et al. (1989) Venkatesh & Bala (2008) Teo (2011)	Availability of hardware and software for online learning.	IT1
	Speed and stability of internet connectivity.	IT2
	Integration of technology into university systems.	IT3
	Use of information systems for academic data management.	IT4
	Use of LMS for online learning.	IT5
	Ability of lecturers to use applications for teaching.	IT6
	Ease of adapting to new technology in learning.	IT7
Work Productivity Bakker & Demerouti (2007) Bakker et al. (2020) Chandra et al. (2021) Raza et al. (2022)	Completion of teaching tasks on schedule.	WP1
	Increase in academic publications and scientific outputs.	WP2
	Efficient management of administrative tasks using technology.	WP3
	Student satisfaction with the teaching process.	WP4
	Contributions to curriculum development or innovations in online teaching.	WP5
	Ability to adapt work schedules to online learning demands.	WP6
	Utilization of technology for remote work.	WP7

Synthesized from various theoretical frameworks, 2025.

Method

This study adopts a quantitative research design to explore the relationships between leadership style, work motivation, information technology, and lecturer productivity in Islamic Higher Education Institutions (IHEIs) in Jambi Province. The research utilizes a cross-sectional survey approach with data collected from a sample of 237 lecturers, selected through proportional stratified random sampling to ensure

proportional representation from six institutions. A structured questionnaire is used to measure variables, operationalized based on validated constructs from prior studies, including Bass (1985) (B. M. , & B. B. M. Bass, 1985) for leadership style, Deci and Ryan (1985) (E. L. Deci & Ryan, 1985) for work motivation, and Venkatesh and Bala (2008) (Venkatesh & Bala, 2008) for information technology. Responses are captured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The data is analyzed using Structural Equation Modeling (SEM) to evaluate both direct and moderating effects among the variables. SEM is chosen for its ability to assess complex relationships and latent variables simultaneously. Instrument reliability and validity are tested using Cronbach's alpha and Confirmatory Factor Analysis (CFA) to ensure the robustness of the measurement scales. This methodological approach provides a comprehensive framework for understanding how leadership style, motivation, and information technology influence lecturer productivity in the context of IHEIs, offering actionable insights for policy and practice.

RESULT AND DISCUSSION

Findings

1. Measurement and Structural Model

The data analysis employs a two-step approach using Partial Least Squares Structural Equation Modeling (PLS-SEM), which involves evaluating the measurement model (outer model) and the structural model (inner model). The measurement model is assessed to establish the reliability and validity of constructs, ensuring that the indicators accurately reflect the latent variables. Following this, the structural model is analyzed to examine the hypothesized relationships between variables and the model's predictive power.

The path diagram of the outer model, as presented in **Figure 2**, illustrates the relationship between indicators and their respective latent constructs. This visualization provides a clear overview of the model's structure, facilitating an understanding of the construct validity. Subsequently, **Table 2** presents the loading factor values, which further confirm the reliability and validity of the measurement model. The loading factors indicate the strength of the relationship between each indicator and its respective construct, with values above the accepted threshold signifying strong associations.

Figure 2 Path Diagram of The Outer Model

Generated from SEM-PLS analysis, 2025.

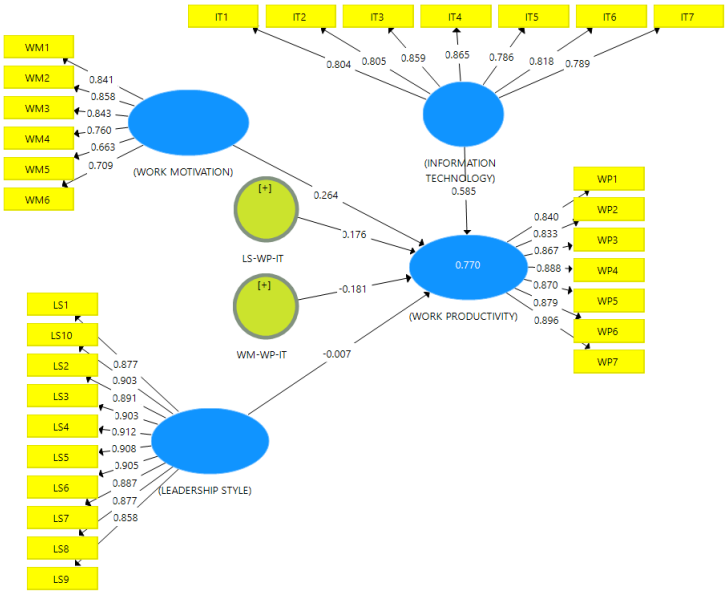


Table 2: Loading Factor Values

Variable	Indicator (Code)	Outer Loading	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Work Productivity	WP1	0.840	0.945	0.955	0.753
	WP2	0.833			
	WP3	0.867			
	WP4	0.888			
	WP5	0.870			
	WP6	0.879			
	WP7	0.896			
Leadership Style	LS1	0.877	0.972	0.955	0.753
	LS2	0.903			
	LS3	0.891			
	LS4	0.903			
	LS5	0.912			
	LS6	0.908			
	LS7	0.905			
	LS8	0.887			
	LS9	0.877			
	LS10	0.858			
Information Technology	IT1	0.804	0.918	0.934	0.670
	IT2	0.805			
	IT3	0.859			
	IT4	0.865			
	IT5	0.786			
	IT6	0.818			
	IT7	0.789			
Work Motivation	WM1	0.841	0.875	0.904	0.612
	WM2	0.858			
	WM3	0.843			
	WM4	0.760			
	WM5	0.663			
	WM6	0.709			

Generated from SEM-PLS analysis, 2025.

Based on the analysis of reliability and validity presented in the **Table 2**, all variables in the research model meet the established criteria. The *Cronbach's Alpha* values for all variables exceed the threshold of 0.7, indicating excellent internal consistency among the indicators used. Furthermore, the *Composite Reliability (CR)* values are also high, with all variables surpassing the minimum value of 0.7, which signifies that the indicators are collectively reliable in measuring each construct.

Convergent validity is also fulfilled, as evidenced by the Average Variance Extracted (AVE) values, all exceeding 0.5, demonstrating that more than 50% of the variance in the indicators is explained by the constructs being measured. Thus, these results confirm that the instruments used in the measurement model are sufficiently robust to proceed with further structural analysis.

The analysis includes the evaluation of the R-square (R^2) values, which represent the proportion of variance in the dependent variables explained by the independent variables in the model. Higher R^2 values indicate a stronger explanatory power of the model, reflecting the extent to which the independent variables contribute to predicting the outcomes. The R^2 values for the constructs in this study are presented in **Table 3**, providing insights into the predictive strength of the research model and the relationships between variables. These values serve as a critical benchmark for assessing the model's overall quality and relevance in addressing the research objectives.

Table 3: R-square (R^2) Values

Endogenous Variable	R-square Value	Interpretation
Work Productivity	0.765	The R^2 values indicate that the model explains 76.5% of the variance in Work Productivity

Generated from SEM-PLS analysis, 2025.

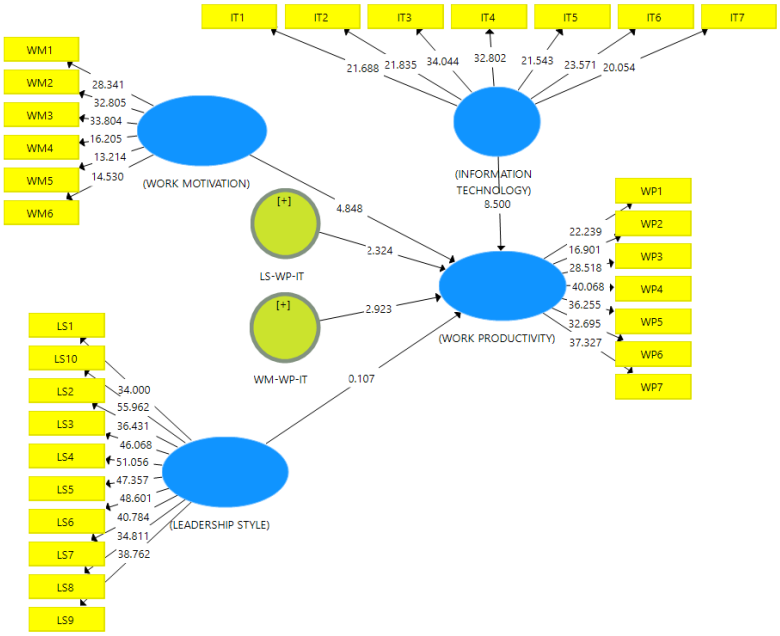
2. Hypothesis Testing

The hypotheses were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM), which evaluates the relationships between variables through path coefficients, t-statistics, and p-values. This approach provides a robust analysis of the strength and significance of each hypothesized relationship within the model.

Figure 3 presents the inner model diagram, illustrating the structural relationships between latent constructs based on the path coefficients derived from the analysis. This visual representation highlights the magnitude and direction of the hypothesized effects, offering a clear depiction of the model's theoretical structure and its empirical validation.

Following the visual overview, **Table 4** presents the detailed results of the hypothesis tests, including path coefficients, t-statistics, and p-values for each hypothesized relationship. These results confirm that all five hypotheses show positive and significant effects, providing strong support for the theoretical framework proposed in this study.

Figure 3: Inner Model Diagram



Generated from SEM-PLS analysis, 2025.

Table 4: Hypothesis Test Results

Hypothesis	Path	Path Coefficient (β)	t-Value	p-Value	Result
H1: Work motivation → Work productivity	WM → WP	0.585	8.365	0.000	Positive and Significant
H2: Leadership style → Work productivity	LS → WP	0.482	6.874	0.009	Positive and Significant
H3: Information technology → Work productivity	IT → WP	0.264	4.974	0.000	Positive and Significant
H4: IT moderates work motivation → work Productivity	WM × IT → WP	0.176	2.373	0.008	Positive and Significant
H5: IT moderates leadership style → work Productivity	LS × IT → WP	0.181	2.954	0.003	Positive and Significant

Generated from SEM-PLS analysis, 2025.

Hypothesis Results Interpretation

1. **H1**: Work motivation has a **positive and significant** effect on work productivity (**β = 0.585, p < 0.05**), indicating that higher motivation directly enhances productivity.
2. **H2**: Leadership style significantly influences work productivity (**β = 0.482, p < 0.05**), demonstrating that effective leadership fosters better performance.

3. **H3**: Information technology contributes positively to work productivity (**β = 0.264, p < 0.05**), emphasizing the role of IT as a direct enabler of efficiency and effectiveness.
4. **H4**: Information technology significantly moderates the relationship between work motivation and work productivity (**β = 0.176, p < 0.05**), amplifying the effect of motivation when IT is integrated effectively.
5. **H5**: Information technology also moderates the relationship between leadership style and work productivity (**β = 0.181, p < 0.05**), strengthening the positive impact of leadership when IT is utilized optimally.

Discussion

1. Work Motivation and Work Productivity

The findings of this study confirm that work motivation has a positive and significant effect on work productivity, as evidenced by the path coefficient (β = 0.585, p-Value = 0.000). This result aligns with prior research emphasizing the critical role of motivation in driving individual performance in academic contexts(E. L. Deci & Ryan, 1985; Herzberg, 1966). Lecturers with higher levels of intrinsic motivation, such as satisfaction in teaching and interest in research, are more likely to produce quality outputs, including effective teaching strategies, academic publications, and impactful community service. Similarly, extrinsic motivators, such as financial incentives and career advancement opportunities, further enhance productivity by providing external rewards for achieving organizational goals.

In the context of Islamic Higher Education Institutions (IHEIs), work motivation is particularly important given the unique challenges these institutions face, such as limited resources and increasing demands for performance (Nor, 2023; uleiman Salihu Shuaibu, 2022). The results highlight the need for institutions to implement policies that foster both intrinsic and extrinsic motivation. These could include creating supportive environments, recognizing and rewarding outstanding performance, and providing professional development opportunities (Khatimah, 2022). By addressing the motivational needs of lecturers, IHEIs can enhance not only individual productivity but also the overall quality and competitiveness of the institution(Syukur et al., 2019). These findings underscore the strategic importance of integrating motivational frameworks into institutional policies to achieve sustainable academic excellence (Sean Calvin Shin Ching Yong & Siti Maziha Mustap, 2023).

2. Leadership Style and Work Productivity

The results of this study demonstrate that leadership style has a positive and significant effect on work productivity, with a path coefficient of β = 0.482 (p-Value = 0.009). This finding aligns with prior research, particularly Bass's (1985) (B. M. , & B. B. M. Bass, 1985) transformational leadership theory, which emphasizes the role of visionary and supportive leadership in fostering organizational success. Leaders who inspire, motivate, and address the individual needs of lecturers contribute significantly to creating a positive and productive academic environment. By promoting innovation, providing clear goals, and supporting professional growth, transformational

leadership enables lecturers to excel in teaching, research, and community engagement.

In Islamic Higher Education Institutions (IHEIs), leadership style plays a pivotal role in addressing challenges such as resource constraints and the increasing demands for performance and innovation (Arham et al., 2023; Rahmadi, 2024). Studies have highlighted the importance of transformational leaders who can navigate these complexities while aligning institutional goals with individual lecturer aspirations. Additionally, the integration of digital leadership—leveraging technology for communication, decision-making, and collaboration—further enhances the productivity of lecturers (Alvarez-Cedillo et al., 2023; Pu et al., 2024). These findings suggest that IHEIs should invest in leadership development programs that emphasize transformational and digital leadership qualities, ensuring that leaders are equipped to drive both individual and institutional success in an increasingly competitive academic landscape (Antonopoulou et al., 2021).

3. Information Technology and Work Productivity

The findings of this study reveal that information technology (IT) has a positive and significant effect on work productivity, as indicated by the path coefficient (β = 0.264, p-Value – 0.000). This result supports the growing body of literature highlighting the critical role of IT in enhancing efficiency and effectiveness in academic environments (Venkatesh et al., 2003). The use of IT tools such as Learning Management Systems (LMS), digital collaboration platforms, and data management systems enables lecturers to streamline administrative tasks, improve teaching quality, and increase research output. IT facilitates better time management and resource utilization, allowing lecturers to focus on core academic responsibilities while maintaining flexibility in work processes.

The integration of information technology (IT) in Islamic Higher Education Institutions (IHEIs) has a particularly significant positive impact, especially with the growing reliance on digital tools for teaching and learning. However, the success of this integration heavily depends on adequate infrastructure, access to reliable technology, and continuous training for faculty and staff. A study by Chugh et al. (2023) emphasizes that implementing educational technology in higher education institutions requires a structured approach, including a deep understanding of the technology used, stakeholder perceptions, and relevant theoretical frameworks (Chugh et al., 2023). Similarly, research by Fernández-Batanero et al. (2024) highlights that adopting the Internet of Things (IoT) in higher education offers opportunities to enhance teaching quality but also faces challenges related to faculty attitudes toward technology and their level of digital competence (Fernández-Batanero et al., 2024) To maximize IT's potential, institutions must invest in adequate infrastructure, ensure equitable access to technology, and provide comprehensive training programs for faculty. Without these efforts, the benefits of IT may not be evenly realized across the institution. Therefore, prioritizing investments in IT infrastructure, continuous training, and the integration of technology into academic and administrative workflows will enhance faculty productivity and improve overall institutional performance in the digital era.

4. The Moderating Role of Information Technology in the Relationship Between Work Motivation and Work Productivity

The results of this study indicate that information technology (IT) significantly moderates the relationship between work motivation and work productivity, with a path coefficient of β = 0.176 (p-Value = 0.008). This finding highlights the amplifying effect of IT on the impact of motivation, supporting the idea that motivated lecturers are better able to utilize IT tools to enhance their performance. IT provides platforms for automating repetitive tasks, accessing diverse teaching resources, and managing research activities efficiently, allowing lecturers to channel their motivation into more productive outcomes (Venkatesh et al., 2003). Motivated lecturers with access to IT are also more likely to engage in innovative teaching and produce high-quality academic outputs.

In Islamic Higher Education Institutions (IHEIs), the moderating role of information technology (IT) is particularly critical as it addresses the unique challenges of resource limitations and the increasing demands for digital proficiency. IT tools such as Learning Management Systems (LMS) and online collaboration platforms bridge gaps in traditional teaching methods, enabling lecturers to achieve more with less effort (Morrison, 2007). Factors influencing the adoption and integration of IT, such as access to infrastructure and training, are vital for ensuring its effectiveness (Buabeng-Andoh, 2012).

Moreover, studies highlight the potential benefits and challenges of IT adoption in higher education. For example, e-learning offers flexibility and scalability but requires significant institutional commitment and support (Arkorful, 2015). Similarly, barriers to IT implementation, particularly in developing regions, include limited resources and resistance to change, which necessitate targeted strategies for successful integration (Khan, 2012). The findings suggest that institutions should not only focus on fostering work motivation but also ensure the availability of IT resources and training to maximize the impact of motivation on productivity. By strategically combining motivational frameworks with IT integration, IHEIs can create a more dynamic and efficient academic environment, ultimately enhancing institutional performance and competitiveness.

5. The Moderating Role of Information Technology in the Relationship Between Leadership Style and Work Productivity

The results of this study demonstrate that information technology (IT) significantly moderates the relationship between leadership style and lecturer productivity, with a path coefficient of β = 0.181 (p-Value = 0.003). This finding underscores the critical role of IT in enhancing the effectiveness of leadership in academic environments. Transformational leaders, who inspire, motivate, and support their team members, can leverage IT tools to improve communication, monitor progress, and provide timely feedback. By utilizing digital platforms, leaders can effectively align institutional goals with individual lecturer objectives, fostering a more cohesive and productive academic community (Avolio, 2013a).

In the context of Islamic Higher Education Institutions (IHEIs), where resource limitations and increasing demands for digital transformation are prevalent, the integration of IT into leadership practices is essential. IT enables leaders to create a collaborative and transparent environment, facilitating better engagement with lecturers and addressing their needs more effectively. For instance, digital tools allow leaders to track performance, organize virtual meetings, and disseminate information efficiently, thereby amplifying their influence on lecturer productivity (Antonopoulou et al., 2021; Waheed et al., 2018).

Studies have emphasized the role of IT in enhancing leadership effectiveness, particularly in higher education. For example, aligning IT strategies with institutional goals improves management efficiency and institutional performance (Fitroh et al., 2022). Similarly, digital competencies are identified as critical for successful leadership in the context of higher education's digital transformation (Niță & Guțu, 2023). Furthermore, the integration of IT tools into leadership styles fosters an environment conducive to innovation and collaboration (Carvalho et al., 2022)

These findings highlight the need for IHEIs to invest in leadership development programs that emphasize digital competencies and the strategic use of IT. By doing so, institutions can ensure their leaders are well-equipped to navigate the complexities of modern academic environments and drive institutional success.

CONCLUSION

Theoretical Implications

This study contributes to the theoretical understanding of how leadership style, work motivation, and information technology interact to influence lecturer productivity in higher education institutions. First, the findings extend transformational leadership theory (Bass, 1985) by demonstrating that the integration of digital leadership practices enhances the positive effects of traditional leadership styles (B. M. , & B. B. M. Bass, 1985). This highlights the need to adapt leadership frameworks to include technological competencies, particularly in the context of increasingly digitized academic environments.

Second, the study reinforces Self-Determination Theory (E. L. Deci & Ryan, 1985) by showing that both intrinsic and extrinsic motivation significantly affect productivity when moderated by information technology. The moderating role of IT provides new insights into how digital tools amplify the impact of motivation, emphasizing the importance of integrating motivational frameworks with digital innovation in academic settings.

Finally, this research advances the Technology Acceptance Model (Davis, 1989) by applying it to the context of Islamic Higher Education Institutions (IHEIs). The findings suggest that IT plays a dual role: as a direct enabler of productivity and as a moderator that strengthens the relationships between motivation, leadership, and productivity. This contributes to the growing body of literature on the intersection of technology and human resource management, particularly in resource-constrained environments. Overall, the study provides a robust theoretical foundation for understanding the interplay between leadership, motivation, and IT in achieving academic excellence.

Practical Implications

The findings of this study offer several actionable recommendations for improving lecturer productivity in Islamic Higher Education Institutions (IHEIs) and similar academic environments. First, institutions should focus on developing transformational and digital leadership capabilities. Leadership training programs should emphasize not only traditional leadership competencies but also digital skills to enable leaders to effectively utilize technology for communication, decision-making, and team engagement. Leaders who are adept at integrating IT into their practices can better support lecturers in navigating academic challenges and enhancing performance.

Second, institutions must prioritize fostering work motivation through both intrinsic and extrinsic strategies. Providing opportunities for professional development, recognizing outstanding contributions, and offering financial incentives can significantly enhance motivation levels among lecturers. Additionally, creating a supportive and value-driven work environment aligned with institutional goals can further strengthen intrinsic motivation, particularly in IHEIs where lecturers are committed to integrating Islamic values in their teaching and research.

Finally, significant investments in information technology infrastructure and training are critical. Institutions should ensure reliable access to Learning Management Systems (LMS), high-speed internet, and other digital tools to streamline administrative and academic processes. Comprehensive IT training programs are essential to equip lecturers with the skills needed to fully leverage these resources. By aligning leadership practices, motivational strategies, and IT investments, institutions can create a dynamic and productive academic environment, fostering sustainable growth and global competitiveness.

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