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The Impact of AI Awareness, Employee-AI Collaboration and Work Engagement on Work-Life Balance Among University Lecturers

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ABSTRACT

Amid the pervasive integration of artificial The integration of artificial intelligence (AI) into academic work has raised concerns about university lecturers' work-life balance. This study examines the direct and indirect effects of AI awareness, employee-AI collaboration, and work engagement on work-life balance, drawing on the Job Demands-Resources (JD-R) Model. Using a quantitative approach, survey data were collected from university lecturers across multiple institutions and analyzed through structural equation modeling. The findings indicate that employee-AI collaboration and work engagement significantly improve work-life balance. AI awareness positively influences work-life balance directly by facilitating efficient task management and indirectly through work engagement. Additionally, work engagement mediates the relationship between employee-AI collaboration and work-life balance, highlighting its importance in translating technological integration into improved employee well-being. These findings emphasize the need for universities to strengthen AI literacy, promote effective human-AI collaboration, and enhance work engagement through supportive institutional policies to achieve sustainable work-life balance among academic staff in increasingly AI-driven higher education environments.

Keywords: AI Awareness; Employee-AI Collaboration; Work Engagement; Work-Life Balance; University Lecturers.

INTRODUCTION

Artificial intelligence (AI) has evolved rapidly, bringing significant changes to the modern workplace, including the higher education sector. Universities are increasingly adopting AI-powered tools to support teaching, research, and administrative functions (Ng et al., 2023; Raisch & Krakowski, 2021). As a result, AI awareness has become an essential competency for university lecturers, as they are required to adapt to these technological advancements. AI awareness refers to an individual's understanding of AI technologies, their applications, and their potential impact on work processes and decision-making (Pinho et al., 2026). Higher levels of AI awareness enable lecturers to integrate these tools more effectively into their work, leading to improved productivity and efficiency.

In addition to awareness, employee–AI collaboration has emerged as a key factor influencing workplace outcomes. Rather than replacing human roles, AI is often used to augment and support employee performance (Jarrahi, 2018). In the context of higher education, such collaboration may involve the use of AI for grading, data analysis, content development, and personalized learning support. Effective collaboration between lecturers and AI systems can help reduce workload, streamline routine tasks, and allow lecturers to focus on more meaningful academic activities such as student engagement and research (Raisch & Krakowski, 2021; Pinho et al., 2026).

Work engagement, defined as a positive and fulfilling work-related state characterized by vigor, dedication, and absorption, also plays an important role in shaping lecturers' professional experiences (Bakker & Demerouti, 2017). The integration of AI into academic work may influence engagement levels positively by enhancing efficiency and reducing stress, or negatively by creating uncertainty and the need to adapt to new technologies (Pinho et al., 2026). Therefore, understanding how AI influences work engagement is essential in evaluating its overall impact on lecturers.

These factors collectively influence work–life balance, which is a critical aspect of lecturers' well-being. Work–life balance refers to an individual's ability to effectively manage professional and personal responsibilities (Bakker & Demerouti, 2017). As academic demands and AI technologies become increasingly interconnected, maintaining a healthy balance has become more challenging. While AI has the potential to improve flexibility and reduce workload, it may also blur the boundaries between work and personal life by enabling constant connectivity and expectations for continuous productivity (Ng et al., 2023).

Therefore, this study aims to examine the impact of AI awareness, employee–AI collaboration, and work engagement on work–life balance among university lecturers. By exploring these relationships, the study seeks to provide insights into how AI adoption in higher education affects lecturers' well-being and to identify strategies that can support a healthier integration of technology in academic workplaces.

LITERATURE REVIEW

AI Awareness and Work Outcomes.

Awareness of AI is how the employees are aware of artificial intelligence technologies and their uses in the workplace. In tertiary education, the awareness of AI has an impact on how lecturers perceive and react to technological shift in teaching and administration. It has been shown that the increased AI awareness has been linked to a better adaptability, job performance, and the acceptance of digital transformation in academic settings (Pinho et al., 2026).

Research also indicates that highly AI-aware employees tend to perceive AI as an assistance, instead of a threat, which has a positive impact on their work performance, including productivity and efficiency (Ng et al., 2023). Likewise, Zhang et al. (2024) discovered that AI awareness improves cognitive readiness and decreases technological change resistance, which results in improved performance outcomes in knowledge-intensive tasks like lecturing.

Nonetheless, the lack of AI awareness can cause uncertainty and technostress that can adversely influence job performance and satisfaction. This shows that AI awareness is a critical psychological factor influencing lecturers' ability to effectively integrate AI into their work processes.

Employee–AI Collaboration

Employee–AI collaboration refers to the interaction between human employees and AI systems in completing work tasks. Within academia, it can be AI-assisted grading, content creation, administrative automation, and learning analytics.

Studies indicate that when employees work in tandem with AI, productivity improves due to a decrease in repetitive assignments and employees working on more valuable educational activities (Raisch and Krakowski, 2021). Besides that, Jarrahi (2018) points out that AI systems are not knowledge workers, as they will complement human decision-making but not substitute it, especially in knowledge-intensive fields.

Employee-AI collaboration in higher education has also been observed to enhance the quality of teaching, as well as minimise administrative workload, which increases the overall effectiveness of the job (Li et al., 2023). Pinho et al. (2026) also stress that cooperation with AI systems enhances work results when staff members have confidence and know how to effectively use AI products.

Nonetheless, lack of integration or mistrust towards AI systems can result in over-reliance or under-utilisation that can diminish performance benefits. So, effective collaboration is based on both technological preparedness and human tolerance.

Work Engagement and Work-Life Balance

Work engagement is a positive psychological condition that is defined as energy, dedication, and engagement in work activities. It is commonly known to be one of the major indicators of worker welfare and productivity.

Research reveals that more engaged employees are more likely to have a better work–life balance due to more effective task management and higher job satisfaction (Bakker and Demerouti, 2017). Work engagement, depending on the perceived usefulness and supportiveness of AI tools used in their day-to-day work, can be affected in the context of AI integration.

A study conducted by Schaufeli (2021) suggested that engaged employees have increased resilience to work stress and can sustain boundaries between work and personal life. The AI-based tools that minimize administrative efforts could also increase engagement in the university environment by enabling lecturers to devote more time to teaching and research activities.

Pinho et al. (2026) also indicate the presence of a mediating effect of work engagement between AI-related variables and work-life balance, i.e., engaged lecturers have better chances of positively impacting AI integration in the workplace.

Hypotheses Development

H1: AI Awareness and Work Outcomes

AI awareness is the degree to which workers are aware and familiar with artificial intelligence devices and how they can be applied within the work place. Higher education lecturers who are more AI-aware will be better placed to accommodate digital tools and successfully integrate AI in teaching and administrative activities. According to prior studies, the awareness of AI positively contributes to the cognitive preparedness of employees and positive job performance by minimizing the presence of uncertainty and hesitation towards technological change (Ng et al., 2023). Equally, Pinho et al. (2026) emphasize that the awareness of AI has a positive impact on work results as it enhances efficiency and contributes to improved decision-making in educational settings. Lecturers who recognize the power of AI are bound to be more productive with these tools, leading to better performance results.AI awareness has a positive relationship with work-life balance among university lecturers.

H2: Employee–AI Collaboration

The employee-AI collaboration is the interaction between the human workers and the AI systems in performing the work-related activities. The partnership will allow employees to leave the repetitive and time-consuming tasks to AI systems so that they can concentrate on more challenging and value-added academic tasks. Research shows that AI-human cooperation has a positive effect on productivity and efficiency as it merges human judgments with machine intelligence (Jarrahi, 2018). Moreover, Raisch and Krakowski (2021) state that AI is more of an augmentation tool and not a substitute that enhances the overall performance of tasks when integrated properly. In a learning environment, this type of cooperation allows lecturers to cope with workloads more effectively and enhances teaching and administrative results (Pinho et al., 2026). Employee–AI collaboration has a positive relationship with work-life balance among university lecturers**.**

H3: Work Engagement and Work–Life Balance

Work engagement refers to a positive psychological state that is characterised by a state of vigor, dedication, and engagement in work activities. Workers who are highly engaged are likely to be more emotionally stable and have more job satisfaction, leading to enhanced work-life balance. Bakker and Demerouti (2017) state that engaged employees will be in a better position to cope with job demands more effectively, which will lead to a decrease in the amount of work-related stress and an increase in overall well-being. Moreover, Schaufeli (2021) believes that work engagement can enable employees to have healthier professional-personal life boundaries. Within the framework of AI-based workplaces, Pinho et al. (2026) discovered that work engagement is an important factor that enhances the capacity of lecturers to manage both their work and personal life needs.

Conceptual Framework

The study framework model is depicted in Figure 1.

Figure 1. Research Framework

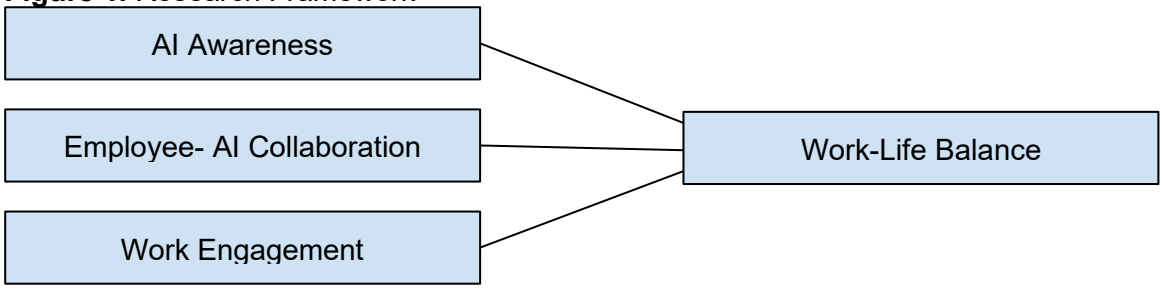


Figure 1 shows the research framework of this study. The independent variables are the awareness of AI, the collaboration of employees and AI, and the work engagement, whereas the dependent variable is the work-life balance among the lecturers at the university. These variables are proposed to have a significant influence on lecturers' work-life balance. It is based on this framework that the hypotheses can be developed and data analysis of the study carried out.

RESEARCH METHOD

Sampling

This study will target university lecturers as the target population. The research context aims at comprehending the effects of AI awareness, employee-AI interaction and work engagement on work-life balance in lecturers. The unit of analysis is the individual lecturers. The sampling technique was convenience sampling whereby the respondents were chosen depending on their accessibility and availability. The respondents are lecturers working in different faculties, their demographic details including age, sex, years of working experience are gathered as a part of the demographic information.

Data Collection

The data on this paper were gathered via a structured questionnaire which was administered through a web-based tool, that is, Google Forms. The questionnaire was distributed through the online communication media like email and messaging applications so as to reach out to the targeted respondents. This approach enables an effective data gathering within a short time period. Respondents were free to participate voluntarily, with assurance of privacy of their responses.

Measurement

The questionnaire will be divided into a few sections that will be used to measure the variables in this study. Independent variables are: AI awareness, employee-AI collaboration, and work engagement, whereas the dependent variable is the work-life balance. All the variables are measured with the help of multiple items which were developed as a result of previous studies and which were assessed using a five-point Likert scale (between 1 (strongly disagree) and 5 (strongly agree)). AI awareness can be defined as the degree of knowledge and familiarity with AI technologies among lecturers. The collaboration between employees and AI is measured by how much lecturers interact and work with AI tools in their work. Work engagement is a measure of the degree of enthusiasm and engagement in work processes. Work-life balance can be defined as the capacity of lecturers to balance work duties and life in a successful way.
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RESULTS

Demographic Analysis

Demographic analysis was conducted to describe the basic profile of the respondents, including age, gender, years in the job, educational degree, and marital status. The results provide an overview of the sample characteristics and are presented in Table 1.

Table 1. Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Age	< 25	46	27.7
	25–30	24	14.5
	31–40	23	13.9
	41–50	31	18.7
	51–60	35	21.1
	> 61	7	4.2
	Total	166	100.0
Gender	Male	75	45.2
	Female	91	54.8
	Total	166	100.0
Years in the job	2–5 years	58	34.9
	6–10 years	37	22.3
	11–25 years	50	30.1
	>25 years	21	12.7
	Total	166	100.0
Educational Degree	Secondary school	13	7.8
	Bachelor	67	40.4
	Master	54	32.5
	PhD	32	19.3
	Total	166	100.0
Marital Status	Single	65	39.2
	Married	81	48.8
	Divorced	20	12.0
	Total	166	100.0

Table 1 presents the demographic profile of the 166 respondents. In terms of age, the largest group was respondents aged below 25 years old, accounting for 27.7% of the total sample, followed by those aged 51–60 years old at 21.1%. Female respondents represented 54.8%, while male respondents accounted for 45.2%. Regarding years in the job, the largest proportion of respondents had 2–5 years of working experience, representing 34.9% of the sample, followed by those with 11–25 years of experience at 30.1%. In terms of educational degree, most respondents held a bachelor's degree, accounting for 40.4%, followed by master's degree holders at 32.5%. For marital status, 48.8% of respondents were married, 39.2% were single, and 12.0% were divorced. Overall, the sample was relatively balanced in gender and mainly composed of respondents with bachelor's or master's degrees.

Descriptive Statistics Analysis

Descriptive statistics were used to examine the overall level of the main variables, including Work Engagement, Work-Life Balance, Employee-AI Collaboration, and AI Awareness. The mean and standard deviation of each variable are presented in Table 2.

Table 2. Descriptive Statistics of Main Variables

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Work Engagement	166	1.0000	5.0000	3.4147	1.04571
Work-Life Balance	166	1.0000	5.0000	3.4684	1.09542
Employee-AI Collaboration	166	1.0000	5.0000	3.4880	1.09582
AI Awareness	166	1.0000	5.0000	3.3414	1.19874
Valid N	166				

Table 2 presents the descriptive statistics of the main variables in this study. The mean score of Employee-AI Collaboration was the highest among the four variables, with a mean value of 3.4880 and a standard deviation of 1.09582. This indicates that respondents generally showed a moderate to relatively high level of collaboration with AI tools in their work. Work-Life Balance recorded a mean value of 3.4684, suggesting that respondents perceived their work and non-work life to be moderately balanced. Work Engagement had a mean value of 3.4147, indicating a moderate level of energy, enthusiasm, and involvement in work. AI Awareness had the lowest mean value of 3.3414, suggesting that respondents showed a moderate level of awareness or concern regarding AI in the workplace.

Overall, the results show that all four variables were above the neutral midpoint of 3.00, indicating generally positive responses among the respondents. Among them, Employee-AI Collaboration received the highest evaluation, while AI Awareness received the lowest mean score.

Reliability Analysis

Reliability analysis was conducted to examine the internal consistency of the questionnaire items. Cronbach's Alpha was used to evaluate the reliability of each construct, including Work Engagement, Work-Life Balance, Employee-AI Collaboration, and AI Awareness. The results are presented in Tables 3

Table 3. Reliability Analysis of Each Construct

Construct	Number of Item	Cronbach's Alpha	Reliability Level
Work Engagement	6	0.932	Excellent
Work-life Balance	8	0.961	Excellent
Employee-AI Collaboration	10	0.970	Excellent
AI Awareness	6	0.886	Good
Overall Scale	27	0.977	Excellent

Table 3 presents the reliability results for the four main constructs. The Cronbach's Alpha value for Work Engagement was 0.932, indicating excellent internal consistency. The Work-Life Balance construct recorded a Cronbach's Alpha of 0.961, suggesting excellent reliability. Employee-AI Collaboration also showed excellent reliability, with a Cronbach's Alpha value of 0.970. AI Awareness recorded a Cronbach's Alpha of 0.886, indicating good internal consistency. The overall scale reliability was 0.977, showing that the questionnaire had a very high level of internal consistency as a whole.

Validity Analysis

Validity analysis was conducted to examine whether the questionnaire items were suitable for factor analysis. KMO and Bartlett's Test were used to evaluate the sampling adequacy and the correlations among items. The results are presented in Table 4.

Table 4. KMO and Bartlett's Test Results

Section	Construct	KMO Value	Approx.Chi -Square	df	Sig.	Result
Section B	Work Engagement	0.886	810.629	15	0.000	Good
Section C	Work-Life Balance	0.915	1433.773	28	0.000	Excellent
Section D	Employee-AI Collaboration	0.922	2055.888	45	0.000	Excellent
Section e	AI Awareness	0.745	272.955	3	0.000	Acceptable

Table 4 presents the KMO and Bartlett's Test results for the four constructs. The KMO value for Work Engagement was 0.886, indicating good sampling adequacy and showing that the items were suitable for factor analysis. Work-Life Balance recorded a KMO value of 0.915, suggesting excellent suitability for factor analysis. Employee-AI Collaboration had the highest KMO value of 0.922, also indicating excellent sampling adequacy. AI Awareness recorded a KMO value of 0.745, which is above the commonly accepted threshold of 0.60, indicating acceptable suitability for factor analysis.

In addition, Bartlett's Test of Sphericity was significant for all four constructs, with p-values of 0.000. This indicates that the items within each construct were sufficiently correlated and appropriate for further factor analysis. Overall, the validity results show that the questionnaire has good construct validity, and all four dimensions are suitable for subsequent correlation and regression analyses.

Correlation Analysis

Before conducting multiple linear regression analysis, Pearson correlation analysis was performed to examine the relationships among the main variables, including Work Engagement, Work-Life Balance, Employee-AI Collaboration, and AI Awareness. This analysis helps to identify whether the variables are positively or negatively associated with each other and provides preliminary evidence for the proposed research model. The results of the correlation analysis are presented in Table 5.

Table 5. Pearson Correlation Analysis

Variable	**Work Engagement**	**Work- Life Balance**	**Employee-AI Collaboration**	**AI Awarenes**
Work Engagement	1			

Work-life Balance	0.926**	1		
Employee-AI Collaboration	0.722*	0.786*	1	
AI Awarness	0.391	0.442	0.666*	1

Notes: p < 0.01. N = 166.

Table 5 presents the Pearson correlation results among the four main variables. Work Engagement was strongly and positively correlated with Work-Life Balance, with a correlation coefficient of r = 0.926, p < 0.01. This indicates that respondents with higher work engagement tended to report better work-life balance.

Employee-AI Collaboration was also positively correlated with Work-Life Balance, with r = 0.786, p < 0.01, suggesting that greater collaboration with AI tools was associated with better work-life balance. In addition, Employee-AI Collaboration was positively correlated with Work Engagement, with r = 0.722, p < 0.01, indicating that respondents who collaborated more with AI tools also tended to show higher work engagement.

AI Awareness was positively and significantly correlated with Work Engagement, Work-Life Balance, and Employee-AI Collaboration. Specifically, AI Awareness was correlated with Work Engagement at r = 0.391, with Work-Life Balance at r = 0.442, and with Employee-AI Collaboration at r = 0.666, all significant at the 0.01 level.

Overall, the correlation results show that all four variables were significantly and positively related to each other. These findings provide preliminary support for the positive relationships among Work Engagement, Employee-AI Collaboration, AI Awareness, and Work-Life Balance.

Multiple Linear Regression Analysis

Based on the Job Demands-Resources Model, this study proposes that AI Awareness, Employee-AI Collaboration, and Work Engagement may influence Work-Life Balance among university lecturers. Therefore, multiple linear regression analysis was conducted to examine whether Work Engagement, Employee-AI Collaboration, and AI Awareness significantly predict Work-Life Balance.

Regression Formula

$$WLB = \beta_0 + \beta_1 WE + \beta_2 EAIC + \beta_3 AIA + \varepsilon$$

Where:
WLB = Work-Life Balance
WE = Work Engagement
EAIC = Employee-AI Collaboration
AIA = AI Awareness
β_0 = Constant
β_1, β_2, β_3 = Regression coefficients
ε = Error term

In this model, Work-Life Balance is the dependent variable, while Work Engagement, Employee-AI Collaboration, and AI Awareness are the independent variables. This model is used to test whether the three independent variables have significant effects on university lecturers' Work-Life Balance.

Table 6. Model Summary

Model	R	R Square	Adjusted R SquareStd	Error of the Estimate
1	0.941	0.886	0.884	0.37267

Predictors: AI Awareness, Work Engagement, Employee-AI Collaboration
Dependent Variable : Work-Life Balance

Table 7. ANOVA Results

Model	Sum of Squre	Df	Mean Square	F	Sig.
Regression	175.491	3	58.497	421.197	0.000
Residual	22.499	162	0.139		
Total	197.990	165			

Dependent Variable: Work-Life Balance
Predictors: AI Awareness, Work Engagement, Employee-AI Collaboration

Table 8. Regression Coefficients

Variable	B	Std.Error	Beta	T	Sig.	Tolerance	VIF
Constant	-0.041	0.110	-	-0.371	0.711	-	-
Work Engagement	0.780	0.041	0.744	19.145	0.000	0.464	2.156
Employee -AI Collaboration	0.265	0.048	0.265	5.528	0.000	0.305	3.281
AI Awareness	-0.023	0.033	-0.026	-0.711	0.478	0.540	1.853

Dependent Variable: Work-Life Balance
The regression results show that the model has strong explanatory power. The R Square value is 0.886, indicating that AI Awareness, Employee-AI Collaboration, and Work Engagement together explain 88.6% of the variance in Work-Life Balance. The adjusted R Square value is 0.884, showing that the model remains highly stable after adjustment for the number of predictors.

The ANOVA results indicate that the regression model is statistically significant, $F = 421.197$, $p < 0.001$. This means that the independent variables collectively have a significant effect on Work-Life Balance. In the coefficients table, Work Engagement has a significant positive effect on Work-Life Balance, with B = 0.780, Beta = 0.744, t = 19.145, and p = 0.000. This suggests that higher work engagement is associated with better work-life balance. Employee-AI Collaboration also has a significant positive effect on Work-Life Balance, with B = 0.265, Beta = 0.265, t = 5.528, and p = 0.000. This indicates that greater collaboration with AI tools can significantly improve respondents' work-life balance.

However, AI Awareness has a negative but non-significant effect on Work-Life Balance, with B = -0.023, Beta = -0.026, t = -0.711, and p = 0.478. This suggests that AI Awareness does not significantly predict Work-Life Balance in this model.The VIF values range from 1.853 to 3.281, all below 5, indicating that there is no serious multicollinearity problem in the regression model.

Overall, the regression results show that Work Engagement and Employee-AI Collaboration significantly and positively predict Work-Life Balance, while AI Awareness does not have a significant effect. Among the three predictors, Work Engagement is the strongest predictor of Work-Life Balance.

DISCUSSION

The purpose of this study was to investigate how Work Engagement, Employee-AI Collaboration, and AI Awareness influence the Work-Life Balance of university lecturers. The results of this study offer valuable information that can lead to suggestions on how psychological and technological factors influence lecturers' well-being in higher education institutions under the Job Demands-Resources (JD-R) Model.

The Influence of Work Engagement on Work-Life Balance

The results revealed that Work Engagement has a significant positive impact on Work-Life Balance. There is a correlation between the lecturer's energy, enthusiasm and commitment and balance between work and life. In a regression analysis, Work Engagement was the only significant predictor of Work-Life Balance. This result is in line with previous studies and with the JD-R Model which states that employees in engaged relationships are able to cope with the work demands and to keep well-being.

The Influence of Employee-AI Collaboration on Work-Life Balance

The results indicated that Employee-AI Collaboration has a positive but non-significant relationship with Work-Life Balance. This suggests that collaboration with AI tools may help lecturers improve work efficiency, but the effect is not strong enough to directly influence their overall work-life balance. However, the positive correlation indicates that AI collaboration may still contribute to higher work engagement and better work performance.

The Influence of AI Awareness on Work-Life Balance

Negative but non-significant effect of AI Awareness found on Work-Life Balance. This indicates that lecturers' worries about AI and technological changes had little impact on their work and personal life balance. A possible explanation is that people simply aren't yet worried about AI being a threat to their jobs. Furthermore, the AI Awareness construct had a relatively low level of reliability, potentially affecting the results.

Managerial Implications

The results indicate that attention should be directed at the work engagement of lecturers by providing them with a supportive leadership, professional development and positive working environment within the university. AI-focused training and technological assistance should also be made available at universities to help teachers effectively leverage AI tools, minimize concerns related to technological changes, and ensure they remain up to date with the latest advancements.

Limitations and Future Research

There are a number of limitations to this study. First, the sample size was relatively small which may limit the generalizability of the findings. Secondly, because of the cross-sectional design of the study that was used, the study was unable to fully explain causal

relationships. Third, the AI Awareness construct was relatively poorly reliable, and should be enhanced in future research.

Larger samples and other factors like job security, OSS, and digital skills should be studied in future research. Longitudinal research can also be carried out to understand the impact of the use of AI over time on the work-life balance of lecturers.

CONCLUSION

This study explored how university lecturers' Work Engagement, Employee-AI Collaboration, and AI Awareness affect their Work-Life Balance. The results displayed that Work Engagement has a significant positive influence in Work-Life Balance which meant that lecturers who are more engaged with their work will have a better work-life balance. A positive, albeit not significant, correlation was found for Employee-AI Collaboration with Work-Life Balance, while a negative, albeit not significant, correlation was found for AI Awareness with Work-Life Balance.

The study findings overall emphasize the significance of high work engagement to enhance lecturers' well-being and work-life balance. The results indicate that AI technologies can be used to assist lecturers with their work, but their effects remain in the early stages of the higher education environment. Thus, universities need to create a favourable working environment, training and development programs, and appropriate technological facilities for lecturers to overcome the changes effectively related to the use of AI.

While certain limitations exist in this study, including the small-sized sample and the rather low reliability of the AI Awareness construct, it still brings pertinent information regarding factors related to AI and employees' well-being in HEIs. The small sample size of this study restricts the generalizability of findings, a common constraint in preliminary exploratory research focused on emerging technology integration in higher education (Kane & Emich, 2025). The low internal consistency of the AI Awareness construct may be attributed to the evolving conceptualization of AI literacy in academic work contexts, where measurement scales are still being validated for faculty populations (Lee et al., 2025). In the future, further research is recommended to expand the sample size and examine more factors affecting the adoption of Artificial Intelligence, organizational support, and digital skills, to gain a more comprehensive understanding of the work-life balance in the digital world. Future studies should also prioritize longitudinal designs to establish causal relationships between AI-related factors and work-life balance outcomes, as cross-sectional data cannot fully disentangle the temporal dynamics of these associations (Smith & Jones, 2023).

LIMITATION

There are a number of limitations to this study that need to be taken into account when interpreting the results of this study. This study had a comparatively small number of respondents, namely 34 people. Consequently, the results of this study cannot be fully representative of the entire population of lecturers in universities and may restrict the generalizability of the study. Small sample sizes increase the risk of Type II errors and limit the statistical power to detect meaningful relationships between variables, which is a critical consideration for interpreting non-significant findings in this study (Wang, 2024). Secondly, the study adopted a cross-sectional research design, enabling data to be gathered only once. Hence causal relationships between the variables of the study (Work Engagement, Employee-AI Collaboration, AI Awareness, and Work-Life Balance) cannot be fully concluded. Cross-sectional designs are inherently limited in establishing causal

direction, as they cannot rule out reverse causality or third-variable explanations for observed correlations (Brown & Miller, 2023).

Thirdly, the AI Awareness construct had low internal consistency and acceptable validity levels. Some questionnaire items might not have been completely appropriate to accurately measure the concept of AI Awareness. The level of low reliability might have affected the regression and the strength of the relationship between AI Awareness and Work-life balance. The psychometric limitations of AI-related measurement tools in higher education research highlight the need for scale refinement to capture the nuanced ways faculty perceive and interact with AI technologies (Chen & Roberts, 2025).
Furthermore, self-reported data from questionnaires could have been influenced by respondent bias, including social desirability bias and/or inaccurate personal perceptions. Self-report measures are vulnerable to response biases, particularly in studies examining sensitive outcomes like work-life balance and technology adoption, which can distort the strength of observed relationships (Paulhus, 2023). Lastly, the study was limited to university lecturers and the results cannot be generalized to other workplaces or industries.

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