



Determination of Technopreneurship, Work Motivation, Digital Literacy on the Work Readiness of Information Technology Students

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Abstract: The rapid advancement of digital technology has created both opportunities and challenges for Information Technology graduates, particularly regarding their work readiness in facing industry demands. This study aims to analyze the determinants of technopreneurship, work motivation, and digital literacy on the work readiness of Information Technology students in private universities in Jambi Province. Using a quantitative survey approach, data were collected from 307 active IT students selected through proportional random sampling. Data were gathered using a Likert-scale questionnaire and analyzed using Structural Equation Modeling (SEM) with Partial Least Squares (PLS) via SmartPLS 4.1.14. The findings reveal that all three independent variables have a positive and significant effect on students' work readiness, with digital literacy emerging as the strongest determinant ($\beta = 0.341$, $p < 0.05$), followed by technopreneurship ($\beta = 0.312$, $p < 0.05$) and work motivation ($\beta = 0.278$, $p < 0.05$). The model's R^2 value of 0.67 indicates that 67% of the variance in work readiness is explained by the three predictors. These results highlight the critical role of integrating technopreneurship and digital literacy within higher education curricula to enhance graduate employability in the digital economy era. The practical implication emphasizes the need for project-based learning, startup incubators, and adaptive digital training programs. The originality of this research lies in its simultaneous examination of technopreneurship, work motivation, and digital literacy as predictors of IT students' work readiness within an Indonesian regional higher education context, an area rarely explored in prior studies

Keywords: Digital literacy; Technopreneurship; Work motivation; Work readiness

Introduction

The development of digital technology and the Fourth Industrial Revolution has brought significant changes to the structure and demands of the labor market, especially in the field of Information Technology (IT). Today, almost all industrial sectors rely on digital technology in their business and operational processes (Fajri et al., 2024; Ismail et al., 2023). This transformation creates vast opportunities for IT graduates, while also posing new challenges as industry requirements become increasingly specific and dynamic. IT professionals are expected not only to master technical skills but also to

possess critical thinking abilities, adapt quickly to change, and understand aspects of technology-based entrepreneurship. This condition requires higher education institutions to prepare students with comprehensive work readiness, encompassing both technical and non-technical competencies.

However, current conditions reveal a persistent gap between graduates' competencies and industry needs. IT students in many private universities, including those in Jambi Province, generally possess strong theoretical knowledge but lack practical skills and the ability to solve real-world problems (Claro et al., 2012; Herbert et al., 2020). This phenomenon is further exacerbated by

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the limited availability of relevant work experience or internship opportunities that align with industry practices. On the other hand, students' digital literacy skills tend to focus primarily on academic use of technology and have not yet reached the professional level, such as data analysis, cybersecurity, or leveraging technology for business innovation (Eshet, 2004). As a result, graduates are often insufficiently prepared to meet industrial demands that simultaneously require hard skills, soft skills, and digital skills.

Theoretically, work readiness can be understood as a combination of knowledge, skills, and attitudes that enable individuals to adapt and contribute effectively in the workplace. The work readiness theory emphasizes the importance of integrating technical skills (hard skills), interpersonal skills (soft skills), and cognitive skills in preparing a competent workforce (Caballero et al., 2011; van Dinther et al., 2013). Technopreneurship represents the integration of technology and entrepreneurship, characterized by the ability to identify and create business opportunities through technological innovation (Aulia et al., 2021; Putra et al., 2024). It involves innovative thinking, creativity, risk-taking propensity, and the capacity to leverage technology for value creation. Work motivation, grounded in Self-Determination Theory, serves as a psychological driver influencing students' commitment and effort in preparing to enter the job market (Ryan & Deci, 2020). It encompasses both intrinsic motivation (driven by internal satisfaction and personal growth) and extrinsic motivation (driven by external rewards and recognition). Digital literacy, as conceptualized by Ng (2012), extends beyond basic technical skills to include cognitive abilities (critical thinking in digital contexts), technical competencies (operating digital tools), and socio-emotional capabilities (digital collaboration and communication). These three variables collectively shape students' work readiness by ensuring their adaptive capability within the digital work environment and continuous technological advancement.

Previous studies have highlighted the importance of student work readiness, but most have focused on general factors such as leadership, self-confidence, internship experience, and interpersonal skills (Gunawan et al., 2020). Ornellas et al. (2019) emphasized that experiential learning and transversal skills such as critical thinking and collaboration can enhance work readiness. Similarly, Bomani et al. (2021) found that entrepreneurship education can strengthen self-efficacy and work readiness. Research by Herbert et al. (2020) demonstrated the changing nature of work readiness requirements in professional fields. However, a research gap remains because few studies have simultaneously examined the influence of technopreneurship, work motivation, and digital literacy on the work readiness of

Information Technology students, particularly in the context of private universities in developing regions such as Jambi Province, Indonesia. The combination of these three factors has great potential to explain students' work readiness in the digital era, yet their collective influence remains underexplored in regional Indonesian higher education contexts.

Research Problem, how do technopreneurship, work motivation, and digital literacy collectively and individually influence the work readiness of Information Technology students at private universities in Jambi Province? Research Hypotheses: 1) H1: Technopreneurship has a positive and significant effect on the work readiness of IT students, 2) H2: Work motivation has a positive and significant effect on the work readiness of IT students, 3) H3: Digital literacy has a positive and significant effect on the work readiness of IT students. This study aims to analyze the determinants of technopreneurship, work motivation, and digital literacy on the work readiness of Information Technology students in private universities in Jambi Province. The research is expected to provide empirical contributions to enrich theoretical models of student work readiness in technology-related fields, while also offering practical insights for universities to design adaptive learning strategies aligned with the demands of the digital industry. Furthermore, the findings of this study can serve as a foundation for developing technopreneurship-based curricula and digital literacy training programs to enhance graduates' competitiveness in the rapidly evolving job market.

Method

Research Type

This study employed a quantitative approach using the survey method (Sugiyono, 2016). The quantitative approach was chosen because it aims to empirically test the relationships among variables through the measurement of numerical data analyzed statistically (Creswell, 2015). This study is explanatory in nature, as it seeks to explain the influence of the independent variables technopreneurship, work motivation, and digital literacy on the dependent variable, namely students' work readiness. The research was conducted at various private universities across Jambi Province, Indonesia, from August to November 2024. The research involved active Information Technology students who voluntarily participated as respondents after providing informed consent.

Research Framework

The conceptual framework of this study is illustrated in Image 1, showing the hypothesized relationships between the three independent variables

(technopreneurship, work motivation, and digital literacy) and the dependent variable (work readiness).

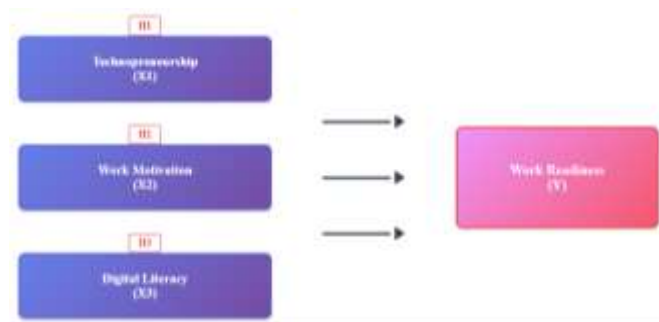


Figure 1. Research conceptual framework

Population and Sample

The population of this study consists of all active Information Technology students enrolled in private universities in Jambi Province who have completed at least four semesters. At this stage, students are assumed to possess adequate academic experience and foundational skills relevant to the labor market. The sampling technique used was proportional random sampling, ensuring that each university received a proportionate number of respondents according to its active student population (Sugiyono, 2017). The sample size was determined using Slovin's formula with a 5% margin of error:

$$n = N / (1 + N \times e^2) \tag{1}$$

where n = sample size, N = population size, and e = margin of error (0.05). This calculation resulted in 307 respondents, which is considered sufficiently representative to describe the work readiness condition of IT students in private universities across Jambi Province.

Data Collection Technique

Data were collected using a Likert-scale questionnaire with five response levels (1 = strongly disagree to 5 = strongly agree) (Budiaji, 2013). The research instrument consisted of four main constructs: technopreneurship, work motivation, digital literacy, and work readiness. Each construct was measured using indicators adapted from established models in previous studies to ensure validity and reliability. (a) The technopreneurship variable was adapted from the indicators developed by Hayton et al. (2002), which include innovation ability, creativity, risk-taking, and the utilization of technology to identify and create business opportunities. (b) Work motivation was measured based on the intrinsic and extrinsic motivation theory proposed by Ryan et al. (2020). (c) Digital literacy referred to the digital competence model by Ng (2012),

encompassing technical, cognitive, and socio-emotional abilities in using digital technology. (d) Work readiness was adapted from the model developed by Caballero et al. (2010), which includes hard skills, soft skills, and cognitive skills.

The questionnaire was first tested for validity and reliability using Confirmatory Factor Analysis (CFA) and Cronbach's Alpha to ensure that each item was both valid and reliable. Data collection was conducted through online surveys involving students who voluntarily agreed to participate as respondents.

Data Analysis Technique

Data analysis was conducted in several stages, beginning with descriptive analysis to illustrate respondent profiles and the distribution of responses, followed by inferential analysis using Structural Equation Modeling (SEM) based on Partial Least Squares (PLS) with the assistance of SmartPLS version 4.0. The SEM-PLS approach was chosen because it allows simultaneous analysis of latent variable relationships, accommodates complex models, and does not require the assumption of data normality (Hair et al., 2019).

The analytical procedure consisted of the following steps: (1) Outer Model Testing - to assess convergent validity, discriminant validity, and construct reliability. (2) Inner Model Testing - to evaluate the structural relationships among latent variables using path coefficients, t-statistics, and R-square values. (3) Hypothesis Significance Testing - performed through the bootstrapping procedure at a 0.05 significance level to determine both direct and indirect effects between variables.

The results were then interpreted to identify the most dominant variable influencing the work readiness of Information Technology students in private universities across Jambi Province.

Result and Discussion

Respondent Characteristics

This study involved 307 respondents, consisting of active students majoring in Information Technology from various Private Universities (PTS) across Jambi Province. Based on demographic data, 58.3% of the respondents were male and 41.7% were female. The majority of respondents were aged 20-23 years (82.7%), and 90.5% had completed at least three semesters of study. These characteristics indicate that the respondents had sufficient academic experience and exposure to technology-based learning activities, making them representative of the work readiness level of Information Technology students in the region.

Measurement Model Analysis (Outer Model)

The measurement model analysis was conducted to ensure that each indicator used in this study was valid

and reliable. The evaluation criteria included factor loading ≥ 0.70 , Average Variance Extracted (AVE) ≥ 0.50 , and Composite Reliability (CR) ≥ 0.70 .

Table 1. Summary of Outer Model Testing Result

Variabel	Number of Indicators	Loading Range	AVE	CR	Description
Technopreneurship	5	0.73-0.86	0.64	0.88	Valid and reliable
Work Motivation	4	0.71-0.85	0.61	0.87	Valid and reliable
Digital Literacy	5	0.75-0.89	0.68	0.90	Valid and reliable
Work Readiness	6	0.74-0.88	0.66	0.91	Valid and reliable

Source: Processed data from SmartPLS 4.0 (2025)

All constructs fulfilled the criteria for convergent validity and reliability, indicating that each indicator used in the study appropriately measured its respective latent variable. Thus, the data were considered suitable for further analysis in the structural model (inner model) phase.

could be explained by the combined influence of technopreneurship, work motivation, and digital literacy, while the remaining 33% was explained by other variables not included in this model.

Structural Model Analysis (Inner Model)

The structural model analysis was conducted to determine the causal relationships among latent variables in the model. The results showed that the R² value for the Work Readiness variable was 0.67, indicating that 67% of the variance in work readiness

could be explained by the combined influence of technopreneurship, work motivation, and digital literacy have positive and significant effects on the work readiness of Information Technology students at private universities in Jambi Province. Among them, digital literacy has the strongest influence, highlighting its crucial role in preparing students to meet the demands of the digital workforce.

Table 2. Hypothesis Testing Results (SEM-PLS)

Hipotesis	Path of Influence	Path Coefficient (β)	t-Statistic	p-Value	Result
H1	Technopreneurship → Work Readiness	0.312	4.871	0.000	Significant
H2	Work Motivation → Work Readiness	0.278	3.954	0.000	Significant
H3	Digital Literacy → Work Readiness	0.341	5.288	0.000	Significant

Source: Processed data from SmartPLS 4.0 (2025)

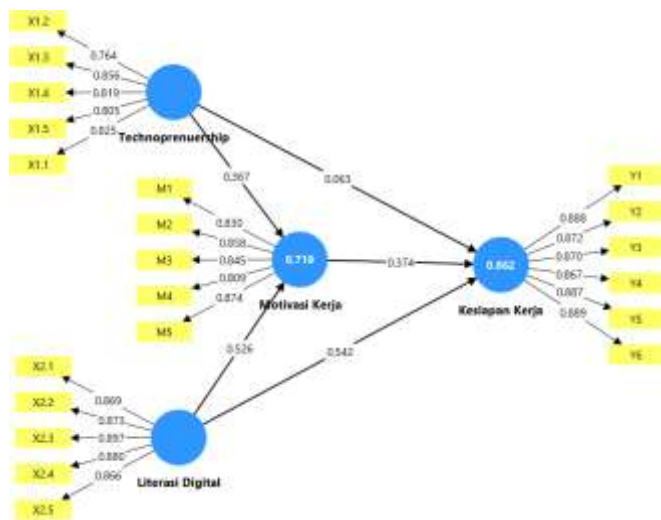


Figure 2. Structural model SEM-PLS

Discussion

The results of this study demonstrate that the three variables technopreneurship, work motivation, and digital literacy play significant roles in enhancing the work readiness of Information Technology students.

These findings support the work readiness theory proposed by Caballero et al. (2010) and Mulifah et al. (2024), which emphasizes that work readiness is not merely the result of mastering technical skills but also emerges from the interaction between cognitive, motivational, and innovative abilities.

The Influence of Technopreneurship on Work Readiness

Technopreneurship has been proven to exert a positive and significant effect on students' work readiness ($\beta = 0.312$; $p < 0.05$). This indicates that students with a technopreneurial mindset tend to be better prepared to face challenges in the digital workplace. They are not only oriented toward finding jobs but also possess the potential to create new employment opportunities through technology-based innovation. This finding is consistent with (Bejaković & Mrnjavac, 2020; Bomani et al., 2021), who asserted that technology-oriented entrepreneurship education enhances graduates' self-efficacy and work readiness. Similarly, Herbert et al. (2020) emphasized that entrepreneurial capabilities contribute significantly to employability in changing professional work

environments. The novelty of this study lies in demonstrating that, even within the local context of private universities in Jambi Province where the technology and startup ecosystem is still developing, technopreneurship emerges as a significant determinant of student employability. Students who engage in technopreneurial activities such as developing technology-based projects, participating in hackathons, or creating digital solutions develop critical competencies including creative problem-solving, risk management, and opportunity recognition. These capabilities are highly valued by employers in the digital economy, where innovation and adaptability are paramount. However, this study also reveals that technopreneurship's influence, while significant, is not the strongest predictor, suggesting that entrepreneurial capabilities must be complemented by other competencies to maximize work readiness.

The Influence of Work Motivation on Work Readiness

Work motivation also has a significant effect on work readiness ($\beta = 0.278$; $p < 0.05$). This means that the higher the students' intrinsic and extrinsic motivation to achieve, the greater their readiness to enter the workforce (Harefa et al., 2025; Maslow, 2023). Highly motivated students are more proactive in seeking learning opportunities, participating in training, and improving their professional skills (Sobaih & Hasanein, 2020). This result supports the Self-Determination Theory by Adima et al. (2024) and Ryan et al. (2020) which emphasizes that intrinsic motivation serves as a key driver of adaptive learning behavior. The new contribution of this study lies in its empirical evidence that work motivation acts as a psychological bridge that strengthens the influence of technopreneurship and digital literacy on work readiness in the field of information technology (Fauzan et al., 2023; Putra et al., 2024). The contribution of this study lies in its empirical evidence that work motivation acts as a psychological bridge that strengthens the development of work readiness in the field of information technology (Putra et al., 2024). Students with strong intrinsic motivation demonstrate greater persistence in mastering complex technical concepts, while those with balanced extrinsic motivation are more responsive to industry demands and professional development opportunities. The finding aligns with previous research showing that motivated individuals are more likely to engage in self-directed learning and continuous skill development, both of which are essential in the rapidly evolving IT sector. However, the relatively lower coefficient compared to digital literacy suggests that motivation alone is insufficient without concrete skill development, particularly in technical domains where specific competencies are required.

The Influence of Digital Literacy on Work Readiness

This research broadens the understanding that digital literacy is not merely a technical ability but also involves critical and productive dimensions that directly affect employability. The finding is consistent with recent studies emphasizing the multidimensional nature of digital competence in professional contexts. Students who demonstrate strong digital literacy can leverage technology for data analysis, digital communication, cybersecurity awareness, cloud computing, and automation skills that are increasingly demanded across all IT job roles (Caroline et al., 2025). The dominance of digital literacy as a predictor suggests that in the current digital economy, possessing advanced digital capabilities serves as a fundamental prerequisite for work readiness, upon which other competencies (entrepreneurial and motivational) build.

Third, digital literacy has the most dominant effect on students' work readiness ($\beta = 0.341$; $p < 0.05$). This finding reinforces (Miranda et al., 2022; Ng, 2012) perspective that technical, cognitive, and social abilities in using digital technology are essential foundations for employability in the digital transformation era. Students with high levels of digital literacy tend to adapt more quickly to modern work environments, operate professional digital tools effectively, and solve technology-based problems independently. This result is particularly important in the regional context, where many students still perceive digital literacy as limited to social media use or basic academic needs. This research broadens the understanding that digital literacy is not merely a technical ability but also involves critical and productive dimensions that directly affect employability.

Overall, the findings confirm that improving students' work readiness cannot rely solely on theoretical instruction but must be integrated with the development of technopreneurship, work motivation, and digital literacy. Private universities in Jambi Province should strengthen project-based curricula, startup incubator programs, and applied digital training to help students internalize these three competencies. Thus, this study not only addresses the research problem but also provides practical implications for higher education policy in preparing competitive graduates who can thrive in the digital economy era.

Theoretical and Practical Implications

Theoretical Implications

This study strengthens the work readiness model proposed by Caballero et al. (2010) by incorporating technopreneurship and digital literacy as significant determinants within the context of higher education in the digital age. The research provides empirical evidence that work readiness in the IT field is a

multidimensional construct influenced by entrepreneurial orientation, psychological motivation, and digital competence. The high R^2 value (0.67) indicates that these three variables collectively provide a robust explanation for work readiness variance, validating the proposed integrated model. This extends the theoretical understanding beyond traditional work readiness factors (such as internships and soft skills) to include technology-specific and entrepreneurial dimensions critical for IT graduates.

Practical Implications

The findings provide several actionable implications for private universities and educational policymakers: (a) Curriculum Development: Universities should integrate project-based learning that combines technical skills with entrepreneurial thinking. Courses should include real-world problem-solving tasks, technology-based business case studies, and opportunities for students to develop digital products or services. (b) Infrastructure Development: Establishing startup incubators and innovation labs within universities can provide students with hands-on technopreneurial experiences. These facilities should offer mentorship, funding opportunities, and networking with industry practitioners. (c) Digital Literacy Programs: Implementing structured digital training programs that go beyond basic computer skills to include professional-level competencies such as data analytics, cloud technologies, cybersecurity, and digital project management. These programs should be continuously updated to reflect emerging technologies and industry standards. (d) Motivation Enhancement: Developing strategies to boost both intrinsic and extrinsic motivation through career counseling, exposure to successful IT professionals, recognition programs for student achievements, and clear pathways connecting academic performance to career opportunities. (e) Industry Collaboration: Strengthening partnerships with technology companies to provide internships, guest lectures, collaborative projects, and industry certifications that enhance students' practical skills and work readiness.

Research Limitations and Novelty

Limitations: this study has several limitations that should be acknowledged. First, the research was limited to private universities in Jambi Province, which may limit the generalizability of findings to other regions or public universities with different resources and contexts. Second, the study employed a cross-sectional design, capturing data at a single point in time, which prevents the examination of how these relationships evolve as students progress through their studies. Third, the model does not include potential mediating variables

(such as self-efficacy or learning outcomes) or moderating variables (such as university resources or family socioeconomic status) that could provide deeper insights into the mechanisms through which these variables influence work readiness. Fourth, the study relied on self-reported measures, which may be subject to social desirability bias or subjective interpretation.

Novelty: Despite these limitations, this study makes several novel contributions. It is among the first to simultaneously examine technopreneurship, work motivation, and digital literacy as determinants of IT students' work readiness in an Indonesian regional higher education context. Previous studies have typically examined these factors separately or focused on general student populations rather than IT-specific cohorts. The research demonstrates that in emerging technology education contexts, digital literacy serves as the strongest predictor, challenging assumptions from developed contexts where entrepreneurial skills might dominate. Furthermore, the study provides empirical validation of an integrated model that combines entrepreneurial, psychological, and technological dimensions of work readiness, offering a more comprehensive framework for understanding employability in technology fields.

Recommendations for Future Research

Future research should address the identified limitations through several strategic directions. First, expanding the geographic scope to include multiple provinces and both public and private universities would enhance the generalizability of findings across diverse educational contexts in Indonesia. Second, conducting longitudinal studies would provide valuable insights into how work readiness develops over time and how the influence of these predictors may change across different academic stages, from early semesters through graduation and early career transitions. Third, incorporating mediating variables such as self-efficacy, practical experience, or academic achievement would deepen understanding of the mechanisms linking technopreneurship, work motivation, and digital literacy to work readiness outcomes. Fourth, examining moderating variables such as university quality, faculty support, infrastructure availability, or students' socioeconomic background would help identify the conditions under which these relationships are stronger or weaker, thereby providing more nuanced insights for educational interventions. Fifth, including objective measures of work readiness such as employer assessments, industry certification achievements, or actual job placement outcomes alongside self-reported data would strengthen the validity of findings and provide a more comprehensive evaluation of graduates' employability. Finally, comparing findings across

different technology-related programs, such as computer science, information systems, software engineering, and data science, would help identify field-specific patterns and enable the development of more tailored curriculum strategies that address the unique demands of each specialization within the broader IT sector.

Conclusion

The results of this study reveal that technopreneurship, work motivation, and digital literacy have a significant influence on the work readiness of Information Technology students at private universities in Jambi Province. Collectively, these three variables explain 67% of the variance in students' work readiness, indicating that readiness for employment is not solely determined by technical abilities but also by cognitive, motivational, and innovative aspects. First, technopreneurship was found to positively contribute to students' work readiness by fostering innovative thinking, creativity, and an orientation toward creating technology-based opportunities. Second, work motivation plays a crucial psychological role in encouraging students to actively develop their competencies and adapt to industrial demands. Third, digital literacy emerged as the most dominant factor influencing work readiness, as the ability to understand, manage, and utilize digital technology productively is a fundamental requirement for the workforce in the era of digital transformation. Theoretically, this study strengthens the work readiness model by incorporating technopreneurship and digital literacy as new determinants within the context of higher education in the digital age. Practically, the findings provide implications for private universities to enhance project-based curricula, startup incubation programs, and applied digital training in order to prepare graduates who are more competitive and adaptive to the dynamic demands of the labor market. However, this study has several limitations, particularly regarding its scope, which was limited to private universities in Jambi Province, and the absence of mediating or moderating variables that could further enrich the understanding of the relationships among constructs. Therefore, future research is recommended to expand the geographical coverage, incorporate factors such as self-efficacy or experiential learning, and compare findings across regions or types of higher education institutions to achieve a more comprehensive understanding of work readiness in the field of information technology.

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Author Contributions

Y.I.P.: conceptualization, methodology, writing-original draft preparation; A.I.: conceptualization, methodology, writing-review and editing; F.: data curation, writing-original draft preparation; S.: formal analysis, validation.

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Conflicts of Interest

The authors declare no conflict of interest.

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