

Analysis of Lecturer Competency and Knowledge in Technopreneurship Development of Student MSMEs in PTS

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ABSTRACT

This study looks at how technopreneurship and its consequent function in assisting the growth of student Micro, Small, and Medium Enterprises (MSMEs) at private institutions in the Banten region are impacted by the knowledge management and skills of lecturers. The goal of the study is to better understand how these elements interact to improve technology focused entrepreneurship education. Using a survey methodology and probability sampling, a quantitative approach was used to gather data from 397 students attending private universities in Banten. Version 3.0 of the Partial Least Squares (PLS) software was used to analyze the data. The findings show that: (1) knowledge management has a significant and positive impact on technopreneurship (t-statistic of 95.378 > t-table 1.649 and a P-value of 0.00 < 0.05); (2) competence has a significant and negative impact on technopreneurship (t-statistic of 7.386 > t-table 1.649 and a P-value of 0.000 < 0.05); (3) knowledge management has no significant effect on MSME development (t-statistic of 0.974 < t-table 1.649 and a P-value of 0.330 > 0.05); (4) competence similarly has no significant effect on MSME development (t-statistic of 0.639 < t-table 1.649 and a P-value of 0.523 > 0.05); and (5) technopreneurship has a significant positive effect on MSME development (t-statistic of 34.058 > t-table 1.649 and a P-value of 0.000 < 0.05).

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1. INTRODUCTION

The Indonesian government through Presidential Regulation (Perpres) Number 2 of 2022 has a target that by 2024 there will be 1 million new entrepreneurs created [1]. One of the initiatives of the Ministry of Education, Culture, Research and Technology (Kemendikbudristek) is Independent Entrepreneurship, which is part of the Independent Campus program of the Indonesian Ministry of Education, Culture, Research and Technology [2]. This program gives students the opportunity to learn and develop into aspiring entrepreneurs through off-campus activities. The Independent Entrepreneurship Program collaborates with Program Implementing Universities to develop entrepreneurial learning that is able to hone the entrepreneurial spirit, encourage increased entrepreneurial experience and increase students employability abilities [3]. Private Universities (PTS) in Banten consist of various choices ranging from universities, institutes, high schools, polytechnics and

academies. These private campuses offer their own advantages. According to the Indonesian Statistics report, there will be 116 private universities in Banten in 2023, consisting of 21 universities, 2 institutes, 59 STIEs, 4 polytechnics and 30 academics [4].

Students are provided with entrepreneurship courses, and with this course it is hoped that they will be able to awaken the spirit of entrepreneurship, independence, work and develop the national economy [5]. A high quality graduate is really needed in building an entrepreneur so that he or she is able to create jobs with the provision of the entrepreneurship education they studied at the university. The university is responsible for providing education, including entrepreneurship education, as well as providing motivation so as to foster an entrepreneurial spirit in students [6]. Along with technological developments, new technopreneurship has emerged in various fields, and in order to be able to compete with today businesses [7], developing MSMEs for students must be accompanied by technology. Technopreneurship is a person ability to develop an entrepreneurial spirit by utilizing technology both in the manufacturing and marketing processes. in accordance with their respective skill competencies [8].

Competence is an important factor in increasing entrepreneurship in facing business competition. Competence is one of the keys to success in entrepreneurship. Various business development problems result from inadequate entrepreneurial competence, especially technical skills and managerial abilities [9, 10]. Likewise with Knowledge Management, students in running their entrepreneurial business need knowledge and skills, where the role of a lecturer is needed in providing knowledge and entrepreneurship education, one of which is Knowledge Management. show that human resource management capabilities are positively related to knowledge management capabilities that turn into innovation [11]. With knowledge management, innovation will automatically grow by itself. Based on the background and phenomena that occurred above, the author is interested in conducting research entitled "Analysis of the Influence of Lecturer Knowledge Management, and Competence on Technopreneurship in the Development of Student MSMEs in PTS in the Banten Region".

Although technopreneurship has been widely discussed in various global contexts, its integration within educational institutions remains underexplored. This study addresses this gap by focusing on the Banten region, offering a model that could be adapted for other regions. Furthermore, this research highlights the importance of aligning academic competencies with practical entrepreneurial applications, providing insights for global technopreneurship education [12].

2. LITERATURE REVIEW

In the field of technopreneurship, the role of knowledge management has become increasingly significant in aligning academic frameworks with entrepreneurial outcomes[13]. Knowledge management facilitates the systematic capture, sharing, and application of information, thereby enabling organizations to adapt to technological advancements and dynamic market conditions. As educational institutions strive to integrate entrepreneurship into their curricula, understanding how knowledge management impacts technopreneurial competencies among lecturers is crucial. This section explores the concept of knowledge management and its influence on lecturers as key enablers of technopreneurship within academic settings [14].

2.1. Knowledge Management Lecturer

The role of knowledge management in technopreneurship is fundamental, as it bridges the gap between theoretical understanding and practical application of entrepreneurial skills in technology driven contexts [7]. In academic settings, effective knowledge management ensures that educators are equipped with the tools and resources necessary to foster innovation and entrepreneurship among students. By systematically capturing, sharing, and utilizing knowledge, institutions can create a dynamic learning environment that supports the development of technopreneurial competencies. This section delves into the principles of knowledge management and examines its impact on lecturers, who play a pivotal role in shaping the entrepreneurial mindset within the academic ecosystem [15].

2.1.1. Understanding Knowledge Management

Technopreneurship, a combination of technology and entrepreneurship, refers to the process of creating value through technological innovation in business ventures. It emphasizes leveraging technology for competitive advantage in entrepreneurial activities. Competency, on the other hand, is defined as a set of characteristics encompassing knowledge, skills, and attitudes that enable individuals to perform tasks effectively.

In the context of technopreneurship, competency must align with technological and entrepreneurial demands to drive innovation and business success [16].

According to Abubakar defines Knowledge Management as any process (either formal policy or informal personal methods) that facilitates the capture, distribution, creation and application of knowledge for decision making [17, 18]. Meanwhile, according to Worsley said Knowledge is information that changes something or someone [19]. This occurs when the information becomes the basis for action, or when the information enables a person or institution to take previous action. knowledge as dynamic, because knowledge is created through social interaction between individuals and organizations. Knowledge is specific in a particular context, depending on time and place [20, 21]. And further according to Raziq [22] states that knowledge management is a management function that creates knowledge, manages the flow of knowledge and ensures that knowledge is effectively and efficiently used for the long-term interests of the organization. So it can be concluded that knowledge management is an activity that aims to find and utilize intellectual resources in an organization.

2.1.2. Knowledge Management Goals

The objectives of knowledge management, as outlined by Cummings, highlight its critical role in ensuring organizational efficiency, adaptability, and innovation. By fostering a structured approach to managing knowledge, organizations can not only reduce operational costs and time but also enhance employee competence and organizational adaptability. This aligns with the broader strategic goal of leveraging knowledge as a competitive advantage in dynamic business environments. Furthermore, increased productivity through the reuse and development of existing knowledge underscores the transformative potential of effective knowledge management in driving sustainable growth and maintaining a competitive edge. There are objectives of knowledge management put forward by Cummings [23], which are as follows:

- Time and cost savings. By having a well-structured source of knowledge, it will be easy for companies to use this knowledge in other contexts, so that companies will be able to save time and costs [24, 25].
- Increased knowledge assets. Sources of knowledge will make it easy for every employee to utilize them, so that the process of utilizing knowledge in the company environment will increase, ultimately the creativity and innovation process will be encouraged more widely and every employee can increase their competence.
- Adaptability. Companies will be able to easily adapt to changes in the business environment that occur.
- Increased productivity. Existing knowledge can be reused for processes or products to be developed, so that the company productivity will increase.

The objectives outlined above underscore the multifaceted benefits of implementing robust knowledge management practices within an organization. By focusing on time and cost savings, companies can streamline their processes and allocate resources more efficiently. The enhancement of knowledge assets ensures that employees have access to valuable information, fostering an environment of creativity and continuous innovation. Adaptability, as another key goal, positions organizations to navigate dynamic market conditions effectively, ensuring resilience amidst change. Lastly, the drive for increased productivity highlights the strategic value of reusing and refining existing knowledge to optimize workflows and output. Collectively, these goals emphasize the strategic importance of knowledge management in achieving operational excellence and maintaining a competitive edge.

2.1.3. Elements of Knowledge Management

The three elements of knowledge management people, process, and technology are interdependent pillars for successful implementation. People act as agents who create, share, and utilize knowledge. Processes align knowledge activities with organizational goals, embedding them in business workflows. Technology supports the efficient collection, storage, and dissemination of knowledge. Together, these elements integrate knowledge management into operations, fostering innovation and adaptability, as highlighted by Lee [26].

First and foremost, people are the key drivers of knowledge management. Their willingness to share, learn, and apply knowledge determines the overall success of the system. Processes ensure that knowledge flows seamlessly within the organization, integrating with business workflows to achieve strategic objectives. Lastly, technology enhances the speed and accuracy of knowledge management activities, offering tools like

databases, analytics, and collaboration platforms to streamline the process. When these elements are effectively integrated, organizations can harness the full potential of their knowledge resources, enabling better decision-making and sustained competitive advantage.

2.1.4. Knowledge Management Indicators

The indicators of knowledge management play a vital role in assessing the effectiveness of knowledge related activities within an organization. These indicators ensure that knowledge is not only created but also utilized and shared effectively to achieve organizational goals. By focusing on the use, sharing, reflection, and identification of knowledge, organizations can develop a comprehensive understanding of how knowledge flows and contributes to their success. These indicators provide measurable benchmarks that guide organizations in evaluating and improving their knowledge management practices. According to knowledge management [27] indicators are Use of Knowledge, Sharing knowledge, Reflection of knowledge, Identify knowledge.

By addressing these four indicators, organizations can create a robust knowledge management system that fosters continuous improvement, collaboration, and adaptability in a competitive business environment.

2.2. Competence

Competence is a fundamental attribute that plays a critical role in effective and superior performance. It involves knowledge, skills, and attitudes that enable individuals to meet the demands of their roles. Competence forms the foundation for achieving organizational goals and supports the development of various professional and personal capacities.

2.2.1. Understanding Competency

Competency is a characteristic in individual behavior that is related to effective reference criteria and/or superior performance in a job or situation [28]. According to Winterton [29, 30], competency is an individual ability to carry out a job correctly and excel based on knowledge, skills, and attitudes. Competence is a person characteristic linked to effective and/or superior performance in specific work situations [31].

Meanwhile, Kusnandar [32] defines competence as the ability possessed by individuals, applied through creativity and innovation. Therefore, competency can be concluded as the capacity within a person that allows them to fulfill organizational demands, achieving expected results.

2.2.2. Competency Characteristics

There are five competency characteristics as indicators to measure competency [33]:

- **Motive:** Something a person consistently thinks or desires that causes an action.
- **Traits:** Physical characteristics and consistent responses to situations or information.
- **Self-concept:** A person attitudes, values, or self-image.
- **Knowledge:** Information that people possess in a specific field.
- **Skills:** The ability to perform certain physical or mental tasks.

2.2.3. Competency Indicators

Competency dimensions/indicators are based on behavior which refers to applicable legislation [34], namely:

- **Knowledge:** Formal learning or training in the relevant work field.
- **Expertise (Skill):** Mastery in the work field, including problem-solving and efficiency.
- **Attitude:** Upholding organizational ethics, friendliness, politeness, and professionalism.

3. TECHNOPRENEURSHIP

Technopreneurship involves a combination of technology and entrepreneurship, emphasizing innovation and technological advancements as drivers for business and economic growth. It enables the creation of high value products and services, leveraging technology for market competitiveness.

3.1. Understanding Technopreneurship

Technopreneurship is a combination of Technology and Entrepreneurship, defined as forming new businesses involving technology to create strategies and innovations for economic development [35]. It is the process of commercializing less valuable technological products into high-value ones [36].

Technopreneurship is a collaboration between technology and business that creates job opportunities and fosters economic growth.

3.1.1. Technopreneurship Development

Developing technopreneurship requires several concepts[31] including the following:

- **Business Skills:** Essential for achieving entrepreneurial goals and include knowledge in entrepreneurship, marketing, pricing, and promotion.
- **Technology Skills:** Managerial skills in mastering technological advancements, such as innovation, intellectual property rights, and industrial design.

3.1.2. Technopreneurship Indicators

Technopreneurship indicators according to Soomro [37] states that the indicators of technopreneurship are as follows:

- Conceptual abilities in technology marketing.
- Recognizing weaknesses in technology products.
- Interest in technopreneurship.
- The desire to create jobs and start businesses.

3.2. MSME Development

MSME (Micro, Small, and Medium Enterprises) development focuses on improving small businesses ability to adapt to market challenges and leverage new technologies for growth. Competence plays a significant role in enabling MSMEs to address challenges effectively and remain competitive.

3.2.1. Understanding MSME Development

MSMEs are defined in Indonesian Law No. 20 of 2008 as trading businesses managed by individuals engaged in productive economic activities. Business development requires creativity and motivation [38] and is influenced by factors such as capital, marketing, labor, and technology.

MSME development involves advancing MSMEs to adapt better to technology and market changes, improving their ability to meet rapid transformations and challenges.

3.2.2. MSME Development Concept

Key factors influencing MSME development include internal and external elements :

- **Internal Factors:** Capital, managerial skills (management, production, marketing, human resources).
- **External Factors:** Issues arising from MSME supervisors, such as lack of monitoring or overlapping programs.

3.2.3. Business Development Indicators

Business development indicators according to Crăciun [39] include:

- **Motive Changes:** Ability to adapt to new business conditions.
- **Opportunity to Grow:** Utilizing opportunities to expand business reach.
- **Need for External Coaching:** The level of reliance on external training to improve performance.

To elaborate, businesses must identify and seize growth opportunities while adapting to market and technological changes. External coaching plays a critical role in enhancing managerial and operational capabilities, ensuring businesses remain competitive in dynamic environments.

4. RESEARCH METHOD

This study employed a quantitative approach to analyze the impact of Management Knowledge, Innovation, and Competence on Technopreneurship in the context of Student MSMEs development in Private Higher Education Institutions (PTS) within the Banten region. The primary data collection method utilized was a survey research method. For data analysis, the research adopted the Structural Equation Modeling (Smart-PLS) analysis technique.

In terms of the population and sample, the study focused on undergraduate students enrolled in PTS within the Banten region. According to Waskom [40], this population comprised 54,431 students. The research employed a Probability Sampling Method, specifically a random sampling method. This approach ensured that every student at PTS in the Banten area had an equal chance of being selected as a sample member.

The sample size was determined using the Slovin Population formula. The formula is expressed as:

$$n = \frac{N}{1 + N(e)^2}$$

where:

- n is the number of samples.
- e represents the standard error (set at 5% or 0.05).
- N is the population.
- 1 is a constant.

Applying this formula to the total population of 54,431 students, the sample size was calculated to be approximately 397. Therefore, the study was conducted with a sample of 397 students from PTS in the Banten area, providing a representative cross section for analyzing the influence of key factors on Technopreneurship in student run MSMEs.

4.1. Data source

Data refers to information related to a research subject.

- Main Sources of Data

Primary data sources are those directly obtained from the original source through observation and recording for the first time. Primary data sources are the initial point where data is generated.

- Sources of Secondary Data

In contrast, secondary data refers to information not directly collected from the original source but acquired from a second party. This type of data supports the primary data held by the researcher and is tailored to meet the specific needs of the research.

4.2. Data Collection Techniques

The data collection method utilized in this study is a questionnaire, which involves gathering information by distributing a list of questions to the respondents.

4.3. Data Analysis Techniques

This study employs Partial Least Squares (PLS) to analyze the relationships among variables due to its flexibility in handling complex models with latent variables. PLS is particularly suitable for exploratory studies in educational research, where the sample size and data normality assumptions may vary. This method offers robust insights into the causal relationships between knowledge management, competency, and technopreneurship.

Primary data were collected through structured questionnaires distributed to students, capturing their perceptions of lecturers knowledge management and competency. Secondary data, derived from institutional reports and academic publications, complemented the primary data by providing contextual and theoretical background for the study.

4.4. Measurement Model (Outer Model)

The measurement model (outer model) is used to evaluate the validity and reliability of the research instrument. Validity testing in this study involves both convergent validity and discriminant validity. Convergent validity is assessed through the measurement model with reflective indicators, which are evaluated based on the correlation between the component/item scores and the construct scores calculated using PLS. If the correlation exceeds 0.70 with the intended construct, the reflective indicator is considered to have high validity. For preliminary research, an outer loading value between 0.5 and 0.6 is considered acceptable.

Discriminant validity, on the other hand, is assessed by comparing the square root of the average variance extracted (AVE) with other values. For adequate validity, the AVE value should exceed 0.5. The formula for AVE is:

$$AVE = \frac{\lambda_i^2}{\lambda_i^2 + \text{var}(\varepsilon_i)}$$

Furthermore, for composite reliability, the recommended value should be above 0.6.

4.5. Structural Model (Inner Model)

Structural models are employed to predict causal relationships between latent variables. These models are evaluated by examining the percentage of variance explained, as indicated by the R^2 value of the dependent variable. The structural equation model is expressed as:

$$N = \beta_0 + \beta_\eta + \eta\epsilon + \zeta$$

Where η describes the vector of endogenous (dependent) latent variables, and ϵ is a vector of residual variables. Each dependent latent variable of the latent variable can be specified as follows:

$$pc = \sum_i \beta_{ji} \eta_i + \sum_i \gamma_{jb} \epsilon_b + \zeta_j$$

Where β_{ji} and γ_{jb} are the path coefficients that connect the endogenous predictor and the exogenous latent variables η and ϵ along the index range i and b , and ζ is the inner residual variable. If the results produce an R^2 value greater than 0.2, it can be interpreted that the latent predictor has a large structural level influence.

The following is an image of the research structural model:

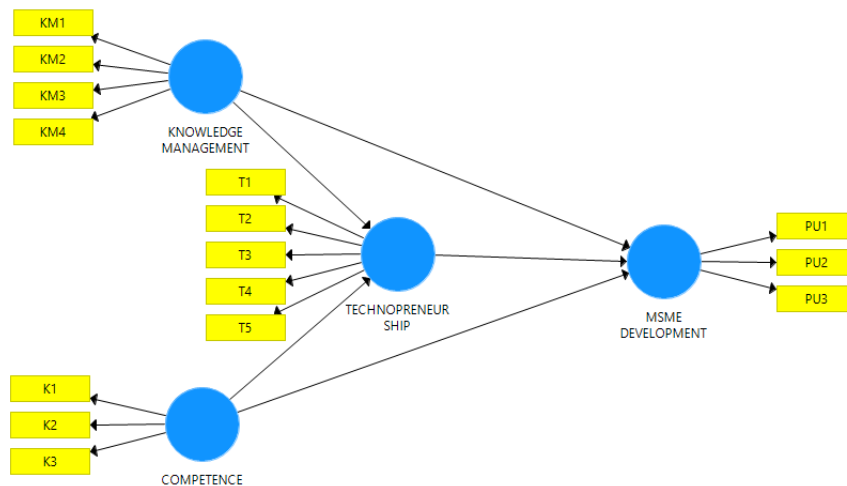


Figure 1. Research Model

4.6. Hypothesis test

Hypothesis testing (β , γ , and λ) was carried out using the bootstrap resampling method. The significance measure of hypothesis support can be determined by comparing the t table and t statistic values based on the following decision-making criteria:

- If t statistic $> t$ table and p values $< \text{sig } 0.05$, then H_a is accepted, and H_0 is rejected.
- If t statistic $\leq t$ table and p values $\geq \text{sig } 0.05$, then H_a is rejected, and H_0 is accepted.

5. RESULT AND DISCUSSION

The empirical analysis of this study illustrates distinct contributions from each of the three pivotal indicators: Knowledge Management, Competence, and Technopreneurship, towards the development of student MSMEs in private universities in the Banten region. Firstly, Knowledge Management emerges as a critical catalyst, where the lecturers ability to effectively manage and disseminate knowledge significantly fosters entrepreneurial skills among students, evidenced by a strong positive correlation in promoting Technopreneurship. This encompasses not only the dissemination of existing knowledge but also the creation and application of new insights, which collectively nurture an innovation-driven entrepreneurial mindset. Secondly, the role of Competence, paradoxically, showed a negative influence on Technopreneurship, suggesting that mere possession of skills and knowledge without their proper application or alignment with entrepreneurial needs may not suffice or could even be counterproductive. It underscores the need for a nuanced approach in fostering competencies that are directly relevant and supportive of entrepreneurial activities. Lastly, Technopreneurship itself, as an educational outcome, stands out with a robust positive impact on MSME Development, signifying that entrepreneurial skills, when integrated with technology and innovation, can significantly amplify the growth and sustainability of student led enterprises.

The findings align with studies conducted in Southeast Asia, which emphasize the critical role of knowledge dissemination in entrepreneurial success. However, the negative correlation between competency and technopreneurship suggests that skills and knowledge must be strategically aligned with entrepreneurial goals to avoid inefficiencies. This highlights the importance of tailored competency frameworks in educational contexts.

5.1. Outer Model Analysis

The outer model testing is conducted to identify the relationship specifications between latent variables and their manifest variables. This process includes evaluations of convergent validity, discriminant validity, and reliability.

Convergent validity is achieved when a correlation has a loading value greater than 0.7. The results indicate that the loading factor exceeds the recommended threshold of 0.7. However, during the research scale development phase, a loading value of 0.60 is still considered acceptable. Therefore, the indicators utilized in this study fulfill the requirements for convergent validity.

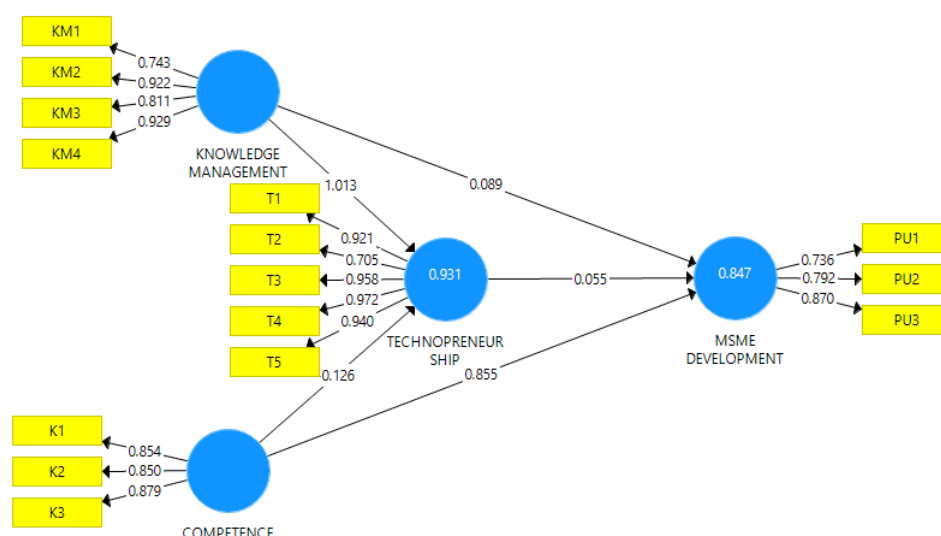


Figure 2. Output Structural Equation Model (SEM)

The Figure 2 represents a structural model analyzed using SmartPLS, illustrating the relationships between the latent variables. Knowledge Management (KM) and Competence (C) influence Technopreneurship (T), which, in turn, impacts MSME Development (PU). The path coefficients show that Knowledge Management has a strong positive and significant effect on Technopreneurship (1.013), while Competence negatively impacts Technopreneurship (-0.126). Furthermore, Technopreneurship positively and significantly influences MSME Development (0.855). The R-square values indicate that 93.1% of the variance in Technopreneurship is explained by Knowledge Management and Competence, while 84.7% of the variance in MSME Development is explained by Technopreneurship. The outer loadings highlight the contribution of individual indicators, with valid indicators showing values above 0.7, such as KM4 (0.929) for Knowledge Management and T4 (0.972) for Technopreneurship. This model underscores the critical role of Knowledge Management and Technopreneurship in supporting the development of student MSMEs.

Table 1. Outer Loading

	Knowledge Management	Competence	Technopreneurship	MSME Development
K1		0.854		
K2		0.85		
K3		0.879		
KM1	0.743			
KM2	0.922			
KM3	0.811			
KM4	0.929			
PU1				0.736
PU2				0.792
PU3				0.87
T1			0.921	
T2			0.705	
T3			0.958	
T4			0.972	
T5			0.94	

Source: Smart PLS Program Output 3.0, 2023.

Based on the data in Table1, it can be seen that the lowest outer loading value in the outer model test results of this research is 0.705 which is in the T2 indicator. Refers to the previously determined outer loading limit, namely 0.7. So these results indicate that the model meets the assumption of convergent validity because the lowest outer loading value is $0.705 > 0.7$.

Table 2. Construct Validity and Reliability

Indicators	Cronbach Alpha	rho_A	Composite Reliability	AVE
Knowledge Management	0.875	0.895	0.915	0.73
Competence	0.826	0.827	0.896	0.742
Technopreneurship	0.941	0.945	0.957	0.819
MSME Development	0.72	0.74	0.843	0.642

Source: Smart PLS Program Output 3.0, 2023.

The data in Table 2 above shows that the lowest AVE value of the 4 variables is 0.642 for the MSME Development variable. These results show that the 4 research variables have met the assumptions discriminant validity because the lowest AVE value obtained is more than 0.5. Meanwhile, in the Cronbach alpha and composite reliability results, it is known that the lowest values are 0.720 and 0.843 for the MSME Development variable. Thus, these results also prove that all variables meet the construct reliability assumptions because the lowest Cronbach alpha and composite reliability values > 0.7 .

The findings of this research show that knowledge management and lecturer competence have a significant impact on technopreneurship, which in turn influences the development of MSMEs by students at private universities in the Banten region. The practical implications of these findings are very relevant for curriculum development and practice of entrepreneurship education at universities. First, universities need to better integrate knowledge and competency management modules that are relevant to market needs and technopreneurship in their curricula. This will help students not only understand theory but also apply this knowledge in real contexts to develop MSMEs.

Second, these findings suggest that lecturers must be provided with adequate resources and training to improve their competence in teaching and transferring knowledge. This is important so they can facilitate effective learning and support students in developing entrepreneurial and technopreneurship skills.

Finally, universities must expand and, if necessary, revise their teaching approaches and curricula to ensure that they provide knowledge and skills that are relevant to market needs and can support students in developing MSMEs. This may include collaboration with industry, government and other stakeholders to ensure that education is provided in line with current market trends and needs

5.2. Inner Model Testing

After testing the outer model, it is necessary to evaluate the final structural equation model (inner model). The inner model test for this research was carried out by looking at the path coefficient and R square values as follows:

Table 3. R Square

Indicators	R Square	R Square Adjusted
Technopreneurship	0.931	0.931
MSME Development	0.847	0.846

Based on table 3, it shows that the value R Square for the Technopreneurship variable it is 0.931, this result explains that the percentage of Technopreneurship is 93.1%. This means that the Knowledge Management and Competency variables influence Technopreneurship by 93.5% and the remaining 6.5% is influenced by other variables, while the R Square for the MSME Development variable is 0.847. This result explains that the percentage of MSME Development is 84.7%. This means that the Technopreneurship variable influences MSME development by 84.7% and the remaining 15.3% is influenced by other variables.

Table 4. Inner Model Test Results

Indicators	Original Sample (O)	Sample Mean (M)	STDEV	T Statistics	P Values
Knowledge Management → Technopreneurship	1.013	1.014	0.011	95.378	0.000
Competence → Technopreneurship	-0.126	-0.126	0.017	7.386	0.000
Knowledge Management → MSME Development	0.089	0.087	0.092	0.974	0.330
Technopreneurship → MSME Development	0.055	0.057	0.087	0.639	0.523
Competence → MSME Development	0.855	0.855	0.025	34.058	0.000

Source: Smart PLS Program Output 3.0, 2023.

The Table 4 reveals that Knowledge Management has a significant positive impact on Technopreneurship, as evidenced by a path coefficient of 1.013. This indicates that effective dissemination and application of knowledge play a crucial role in enhancing entrepreneurial activities. In contrast, Competence negatively

affects Technopreneurship, with a path coefficient of -0.126, suggesting that increasing competencies without aligning them to entrepreneurial needs may impede the development of Technopreneurship.

Meanwhile, Knowledge Management has a slight positive but insignificant effect on MSME Development, with a path coefficient of 0.089, and Competence shows an even weaker and insignificant influence at 0.055. These findings suggest that neither factor directly drives MSME growth. However, Technopreneurship emerges as a key contributor to MSME Development, showing a significant positive influence with a path coefficient of 0.855. This underscores the vital role of Technopreneurship as a bridge, translating academic knowledge and skills into meaningful and measurable business outcomes.

5.3. Hypothesis Testing

This study includes five hypotheses formulated as research questions that require validation. Hypothesis testing is conducted using the t-test, which involves comparing the t-statistic values obtained through bootstrapping with the critical t-table value of 1.649 at a 5% (0.05) significance level. The results of the hypothesis testing are presented as follows:

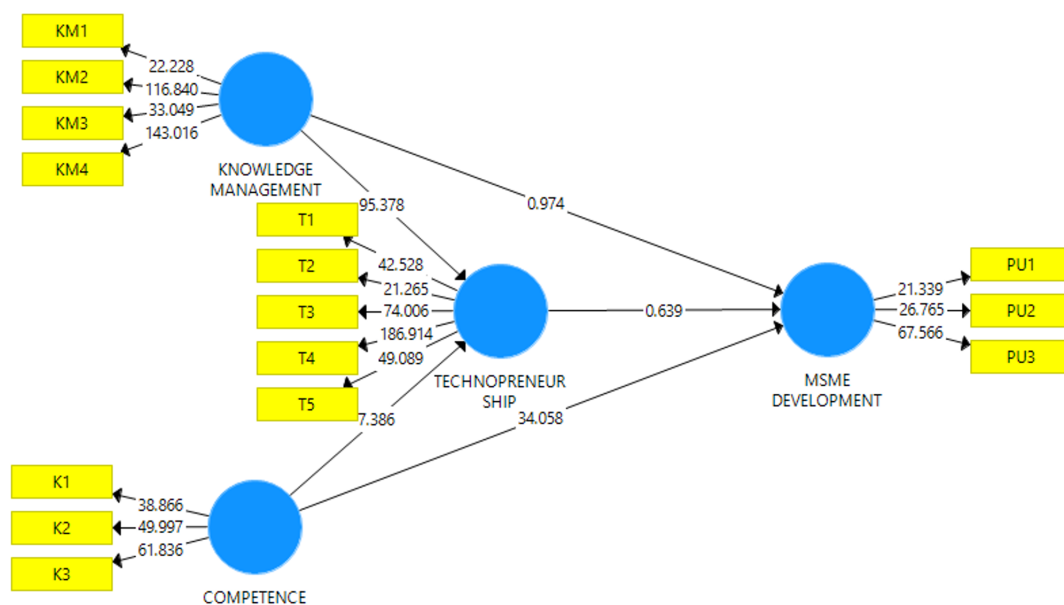


Figure 3. Inner Model of Bootstrapping Testing

This study meticulously examined the influence pathways from Knowledge Management and Competence to Technopreneurship and MSME Development. The positive and significant impact of Knowledge Management on Technopreneurship underlines the pivotal role of information dissemination and application in nurturing an entrepreneurial mindset and innovative practices among students. Such findings suggest that effective knowledge management by lecturers cultivates a conducive learning environment that encourages and accelerates the assimilation of entrepreneurial competencies among students, fostering their technopreneurial endeavors.

Conversely, the observed negative relationship between Competence and Technopreneurship warrants a nuanced interpretation. It suggests that while competencies are inherently valuable, their alignment with entrepreneurial objectives and contexts is critical. This finding indicates that mere acquisition of skills without their strategic application towards entrepreneurial innovation may hinder rather than promote technopreneurship. It underscores the importance of contextually relevant and applied competencies that synergize with entrepreneurial aspirations and technological acumen.

Moreover, the non significant impacts of Knowledge Management and Competence on MSME Development prompt a reconsideration of the direct applicability of these educational inputs on business outcomes. This suggests the necessity for an intermediary, possibly Technopreneurship, which was found to significantly foster MSME Development, indicating that entrepreneurial activities enhanced by technology are crucial mediators that translate academic competencies and knowledge into tangible business growth and sustainability.

Table 5. Direct Effect Test Results

Indicators	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values	Note
Knowledge Management → Technopreneurship	1.013	1.014	0.011	95.378	0.000	Accepted
Competence → Technopreneurship	-0.126	-0.126	0.017	7.386	0.000	Accepted
Knowledge Management → MSME Development	0.089	0.087	0.092	0.974	0.330	Rejected
Technopreneurship → MSME Development	0.055	0.057	0.087	0.639	0.523	Rejected
Competence → MSME Development	0.855	0.855	0.025	34.058	0.000	Accepted

Source: Smart PLS Program Output. 3.0, data processed by the author in 2023.

Based on the PLS output (bootstrapping test) presented in Table 5, the results reveal significant insights into the relationships between the variables. The H1 confirms that Knowledge Management positively and significantly impacts Technopreneurship, with a relationship strength of 101.3% (t-statistic = 95.378, P-value < 0.05). This indicates that effective knowledge management fosters technopreneurial capabilities among students. Conversely, the H2 shows that Competency negatively and significantly affects Technopreneurship, with a relationship strength of -12.6% (t-statistic = 7.386, P-value < 0.05), suggesting that the misalignment or ineffective application of competencies may hinder technopreneurial growth.

For MSME Development, the H3 finds that Knowledge Management has no significant impact (t-statistic = 0.974, P-value > 0.05), and the H4 concludes that Competency also has no significant influence (t-statistic = 0.639, P-value > 0.05). However, the H5 highlights that Technopreneurship has a strong positive and significant effect on MSME Development, with a relationship strength of 85.5% (t-statistic = 34.058, P-value < 0.05). These findings emphasize the critical role of Technopreneurship as a mediator, translating knowledge and competencies into tangible MSME growth and sustainability.

This research offers new insights into the influence of knowledge management and lecturer competence on technopreneurship and the development of MSMEs by students at private universities in the Banten region. While previous research has recognized the importance of these factors in the context of entrepreneurship in general, our research specifically highlights how these two factors interact in the context of higher education and contribute to students technology entrepreneurial capabilities.

In contrast to previous research which may only emphasize one aspect, such as competence or management knowledge separately, our findings show how the interaction between these two factors can significantly influence technopreneurship, which is an important key for the development of MSMEs by students. This research is also unique because it focuses on the PTS context in the Banten region, providing a specific geographic context that has not been studied much before. Our conclusion that management knowledge has a positive and significant influence on technopreneurship, while competence has a negative influence, provides new insight into the dynamics that influence the development of entrepreneurship among students. Furthermore, the positive influence of technopreneurship on the development of MSMEs confirms the important role of technopreneurship in this context, broadening our understanding of the factors that drive the success of MSMEs among students.

Therefore, this research not only adds to the existing literature by providing empirical evidence from an underexplored area but also by highlighting the complex interactions between knowledge management, competence, and technopreneurship in the development of MSMEs by students.

These findings show that knowledge management and lecturer competence have a significant effect on technopreneurship, which then has an impact on the development of MSMEs by students. Although knowledge

management shows a strong positive influence on technopreneurship, competence, in contrast, shows a negative influence. The practical implications of these findings are very important for improving entrepreneurship education strategies and programs in higher education.

In the educational context, universities can develop curricula and teaching methods that are more integrated with market needs and the latest technology, encourage direct involvement of students in entrepreneurial projects, and provide more resources to support student innovation and entrepreneurship. Furthermore, universities can work together with industry players and the government to ensure that the entrepreneurship education provided is relevant to the needs of the job market and can support the growth of MSMEs.

For MSME developers, this research emphasizes the importance of integrating the latest knowledge and technology in developing businesses, highlighting the expansion of entrepreneurship training and education that focuses not only on increasing technical competence but also on managing and applying knowledge in entrepreneurial practice. To enhance technopreneurship education, universities should integrate experiential learning modules, such as industry collaborations and live entrepreneurial projects, into their curricula. Policy-makers must also promote initiatives that connect academia with industry to facilitate the practical application of knowledge and skills. Additionally, lessons learned from this study can be adapted by institutions in other regions, fostering a global exchange of best practices in technopreneurship education.

6. MANAGERIAL IMPLICATIONS

The findings of this study provide valuable insights for stakeholders in private Higher Education Institutions (PTS), particularly in the Banten region, to enhance entrepreneurial outcomes and foster MSME development among students. First, Knowledge Management emerges as a critical driver for developing technopreneurship. Therefore, universities should invest in training programs that empower lecturers to effectively manage, disseminate, and apply knowledge. Establishing knowledge-sharing platforms and incorporating real world case studies into the curriculum can enhance students understanding of entrepreneurship and its application in technology driven businesses.

The negative relationship between Competency and Technopreneurship suggests the need for a more nuanced approach to competency development. Institutions must ensure that the competencies being developed align closely with the practical demands of entrepreneurial ventures. This alignment can be achieved by collaborating with industry partners to identify key skill gaps and designing targeted competency-building programs. Workshops, internships, and experiential learning opportunities focused on marketing, technological innovation, and business management can better prepare students for entrepreneurial success.

The significant positive influence of Technopreneurship on MSME development underscores the importance of integrating technology into entrepreneurial education. Universities should focus on equipping students with the necessary digital tools and resources to innovate and scale their ventures. Establishing partnerships with technology providers and incubators can provide students with hands on experience and access to advanced tools. Additionally, encouraging students to actively participate in tech oriented entrepreneurial activities, such as hackathons and startup competitions, can further enhance their ability to create sustainable MSMEs. By implementing these strategies, PTS can not only improve the quality of entrepreneurial education but also contribute to the broader development of MSMEs, ultimately supporting regional economic growth and advancing Indonesia's entrepreneurial ecosystem.

7. CONCLUSION

Based on the research findings, it is evident that Knowledge Management significantly and positively influences Technopreneurship in Private Higher Education Institutions (PTS) in the Banten region. This demonstrates the pivotal role of effective knowledge dissemination and management in fostering entrepreneurial capabilities. However, the findings reveal a negative and significant relationship between Competency and Technopreneurship, suggesting that merely possessing skills without proper alignment with entrepreneurial objectives may impede progress. This underscores the need for tailored competency development that aligns with the demands of technopreneurial initiatives.

The study further highlights that Knowledge Management does not directly impact the development of student MSME, nor does Technopreneurship itself influence MSME growth in PTS. Nevertheless, the significant positive effect of Technopreneurship on MSME development indicates that technology-driven entrepreneurial activities are crucial mediators in translating educational inputs into tangible business out-

comes. These results emphasize the importance of integrating Technopreneurship into educational frameworks to bridge the gap between academic knowledge and entrepreneurial success.

In light of these conclusions, it is recommended that entrepreneurial students in PTS effectively leverage technology for marketing to enhance sales and income. Additionally, fostering student competencies in marketing, knowledge, and technological skills is crucial for improving their ability to grow their MSME products. Institutions should focus on curriculum enhancement and industry collaboration to provide practical, technology oriented education that empowers students to innovate and succeed in the competitive entrepreneurial landscape.

8. DECLARATIONS

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8.2. Author Contributions

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8.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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8.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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