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From Students To Talent: Orchestrating Human Capital For The Technopreneurial University Transformation

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Abstract

This research focuses on testing the effectiveness of the Student-HRM framework—Competency Development, Incentive Support, and Innovation-based Assessment—in influencing multidimensional transformation of student technopreneurship (Culture, Digital Readiness, and Innovation Ecosystem) in higher education institutions. Based on a quantitative explanatory design, data were obtained from 100 undergraduate students who are actively involved with digital entrepreneurship programs through a purposive sampling technique. The conceptual model was tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 4 to assess the measurement model and evaluate the structural path coefficients by a bootstrapping procedure using 5,000 subsamples. The structural model shows significant predictive power (R2 > 0.70). The results highlighted a surprising paradox: Competency Development Support did not contribute significantly to transformation in any dimension, therefore questioning the ingrained belief that training alone leads to readiness. On the other hand, Incentive and Appreciation Support emerged as the stronger predictor and significantly affected all three dimensions. Innovation-based Assessment, however, was effective only in shaping the Technopreneurship Culture but proved ineffective in improving Digital Readiness or Ecosystem engagement.

Keywords: *Student-HRM, Technopreneurship Transformation, PLS-SEM, Social Exchange Theory, Higher Education Policy*

Abstrak

Penelitian ini berfokus pada pengujian efektivitas kerangka kerja Student-HRM—Pengembangan Kompetensi, Dukungan Insentif, dan Penilaian berbasis Inovasi—dalam memengaruhi transformasi multidimensi technopreneurship mahasiswa (Budaya, Kesiapan Digital, dan Ekosistem Inovasi) di institusi pendidikan tinggi. Berdasarkan desain eksplanatori kuantitatif, data diperoleh dari 100 mahasiswa program sarjana yang terlibat aktif dalam program kewirausahaan digital melalui teknik purposive sampling. Model konseptual diuji menggunakan Partial Least Squares Structural Equation Modeling (PLS-SEM) melalui SmartPLS 4 untuk menilai model pengukuran dan mengevaluasi koefisien jalur struktural dengan prosedur bootstrapping menggunakan 5.000 subsampel. Model struktural menunjukkan kekuatan prediksi yang signifikan (R^2 > 0,70). Hasil penelitian menyoroti

sebuah paradoks: Dukungan Pengembangan Kompetensi tidak berkontribusi secara signifikan terhadap transformasi dalam dimensi apa pun, sehingga mempertanyakan keyakinan mendalam bahwa pelatihan saja menghasilkan kesiapan. Di sisi lain, Dukungan Insentif dan Apresiasi muncul sebagai prediktor yang lebih kuat dan memengaruhi ketiga dimensi secara signifikan. Namun, Penilaian berbasis Inovasi hanya efektif dalam membentuk Budaya Teknopreneurship, tetapi terbukti tidak efektif dalam meningkatkan Kesiapan Digital atau keterlibatan Ekosistem.

Kata kunci: Student-HRM, Transformasi Technopreneurship, PLS-SEM, Teori Pertukaran Sosial, Pendidikan Tinggi.

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INTRODUCTION

The role of higher education institutions has fundamentally transformed from that of merely storing knowledge to that of engines of economic growth in the Fourth Industrial Revolution (Nicotra et al., 2021; Schnurbus et al., 2022). Universities are now expected to produce graduates who are not only employable but also capable of navigating complex economic landscapes and creating jobs driven by technology. As a result, higher education institutions around the world are rushing to support this new mandate by transforming their ecosystems, digital readiness, and campus culture (Audretsch and Belitski, 2022; Miller et al., 2021). Digital entrepreneurial competencies are actively cultivated in innovation ecosystems, where this shift necessitates moving beyond traditional knowledge transfer to become transformative drivers (Secundo et al., 2020).

However, despite significant investments in incubation centres and digital infrastructure, many universities struggle to implement this transformation. A recurring productivity paradox exists where the availability of advanced technology does not linearly translate into technopreneurial output. Human-ware is frequently the source of the bottleneck instead of hardware. While a great deal of research has been done on the role of faculty and leadership in the shift toward entrepreneurial universities, very few studies have looked at students as the primary source of human capital in this setting. Traditionally, neoliberal models of higher education have framed students merely as customers to be satisfied (Bunce et al., 2017; Tomlinson, 2017; Gupta et al., 2025). According to recent research (Lackéus, 2020; Pettersen et al., 2020; Morland et al., 2021), it is necessary to manage students as talent or intellectual assets who actively contribute to the creation of value within the innovation ecosystem as opposed to merely consuming educational services.

The pedagogical aspects of entrepreneurship, such as curriculum design and teaching methods, have been the primary focus of the existing literature. Students may possess cognitive knowledge about startups, yet lack the cultural agility, technical readiness, and ecosystem engagement required to execute digital ventures (Liu, 2025; Maslacki et al., 2025). This suggests that managerial rather than educational barriers to transformation exist. Research that examines students through the lens of Human Resource Management (HRM) is rare. If students are a university's primary talent, then the processes for managing, motivating, and developing them should be modelled after high-performance organizations' strategic HRM practices.

The student-HRM framework is proposed in this study to fill this void. Competency Development Support: Providing targeted training (Human Capital); Incentive and Appreciation Support: Offering rewards and safety nets (Motivation); and Innovation-based

Assessment: Institutionalizing innovation metrics (Performance Management), according to our argument, must be adopted by universities to drive technopreneurship transformation. The central premise is that transforming a university requires orchestrating student behaviour through strategic HRM practices. This study investigates three crucial levers: Innovation-based Assessment Support (X3), which represents the opportunity and structural legitimacy; Incentive and Appreciation Support (X2), which represents the motivation to take risks; and Competency Development Support (X1).

This study's primary objective is to empirically examine the effectiveness of these Student-HRM practices in driving a multidimensional technopreneurship transformation, with a particular focus on the Innovation Ecosystem, Technopreneurship Culture, and Digital Readiness. This research seeks to answer a crucial question: Which university support mechanisms truly drive student transformation? Is it the pressure (assessment), motivation (incentives), or instruction (competency)? These support factors are frequently examined separately in existing studies, which results in inconsistent and fragmented findings regarding the most efficient mechanisms for encouraging entrepreneurial behaviour. For instance, a substantial amount of research suggests that training that is competency-based is necessary for fostering entrepreneurial intention and skills. Conversely, other scholars contend that without extrinsic incentives and structural reform in academic assessment, training alone remains ineffective, as it fails to address the underlying institutional barriers and lack of motivation (Munari et al., 2016).

By simultaneously examining the impact of these three HRM dimensions on the university's holistic transformation—Technopreneurial Culture (Y1), Digital Readiness (Y2), and the Innovation Ecosystem (Y3)—this study seeks to resolve this controversy. This study provides a comprehensive analysis of how universities can engineer a technopreneurial transformation by integrating Expectancy Theory and the AMO (Ability, Motivation, and Opportunity) Framework. It is anticipated that this study's findings will provide university administrators with an evidence-based plan for moving from a traditional pedagogical model to a talent-management model, thereby expediting the realization of the technopreneurial campus. By bridging the fields of human resource management and entrepreneurship education, this study adds to the existing body of knowledge. By examining institutional pressures (Institutional Theory) and behavioral and motivational drivers (Social Exchange Theory) in the context of Gen-Z students, it challenges the conventional training-centric perspective. The findings provide policymakers at universities with concrete advice on how to improve the effectiveness of their support systems.

METHODOLOGY

The purpose of this study is to investigate the direct connections that exist between the transformation of technopreneurship and student-centred human resource management practices using a quantitative approach and an explicatory research design. At a single point in time, a cross-sectional survey was used to collect data. The purpose of this design was to capture the immediate effect that the current support mechanisms for universities have on student behaviour and the formation of ecosystems.

This study's participants are undergraduate students at an Indonesian private university who are actively participating in digital entrepreneurship programs. To ensure that respondents had sufficient experience with the university's support system, a purposive sampling method was used. After a rigorous data cleaning process to remove incomplete responses and outliers, the final sample size consists of 100 valid respondents. While this sample size is relatively modest, it meets the requirements for Partial Least Squares Structural Equation Modelling (PLS-SEM). According to the 10-times rule (Memon, 2020), the minimum sample size should be ten times the maximum number of structural paths directed at a

particular construct. In this model, the maximum number of predictors is three; thus, a sample of 100 is well above the minimum threshold of 30, ensuring sufficient statistical power.

A structured questionnaire with a 5-point Likert scale from "Strongly Disagree" to "Strongly Agree" served as the research instrument. Independent Variables (Student-HRM) were used to model all constructs, including Innovation-based Assessment Support (X3), Incentive and Appreciation Support (X2), and Competency Development Support (X1). Technopreneurship Culture (Y1), Digital Readiness (Y2), and the Innovation Ecosystem (Y3) are all dependent variables (Transformation). SmartPLS 4 and partial least squares structural equation modelling (PLS-SEM) were utilized for the analysis of the data. PLS-SEM was chosen over CB-SEM for two primary reasons: (1) its high efficiency with smaller sample sizes and non-normal data distributions (Hair et al., 2019); and (2) its primary focus on maximizing the explained variance (R2) of the dependent variables, which is in line with the study's predictive objective.

RESULTS AND DISCUSSION

A. ***Measurement Model Assessment***

The assessment of the measurement model began by evaluating individual indicator reliability through outer loadings. According to Hair et al. (2019), a measurement item is considered reliable if its outer loading exceeds the threshold of 0.708. This threshold implies that the construct explains more than 50% of the indicator's variance. As presented in Table 1 (Outer Loadings), the results demonstrate that all items across the six constructs (X1, X2, X3, Y1, Y2, and Y3) successfully met the required criterion. The outer loadings ranged from 0.705 to 0.941.

The highest loading was observed in item Y2.2 (0.941), demonstrating strong indicator reliability for the Digital Readiness construct. Conversely, the lowest loading was recorded for item X1.2 (0.705). Although this value is marginally below the 0.708 threshold, it was retained because the Average Variance Extracted (AVE) for the Competency Development Support (X1) construct is 0.634 as presented in Table 2 (Construct Reliability), which remains well above the required minimum of 0.50. Thus, all indicators were deemed reliable and were preserved for further analysis.

Table 1. Outer Loadings

	X1	X2	X3	Y1	Y2	Y3
X1.1	0.814					
X1.2	0.705					
X1.3	0.767					
X1.4	0.861					
X1.5	0.817					
X1.6	0.802					
X2.1		0.854				
X2.2		0.887				
X2.3		0.807				
X2.4		0.885				
X3.1			0.909			
X3.2			0.869			
X3.3			0.920			
X3.4			0.935			

Y1.1				0.887		
Y1.2				0.859		
Y1.3				0.894		
Y1.4				0.883		
Y1.5				0.895		
Y2.1					0.924	
Y2.2					0.941	
Y2.3					0.894	
Y2.4					0.939	
Y2.5					0.863	
Y3.1						0.880
Y3.2						0.918
Y3.3						0.920
Y3.4						0.934

Source: Author, 2026

After confirming indicator reliability, the study assessed the internal consistency reliability and convergent validity of the constructs. Internal consistency was evaluated using both Cronbach's Alpha and Composite Reliability (rho_c). Values ranging between 0.70 and 0.95 are considered satisfactory according to Hair et al. (2019).

As detailed in Table 2, the results demonstrate high internal consistency for all constructs. The Cronbach's Alpha coefficients ranged from 0.881 (Incentive Support/X2) to 0.950 (Digital Readiness/Y2). Similarly, the Composite Reliability values were robust, ranging from 0.912 to 0.961, significantly exceeding the 0.70 threshold. These figures indicate that the items used to measure the constructs are highly consistent.

Furthermore, Convergent Validity was examined using the Average Variance Extracted (AVE). To establish convergent validity, the AVE should be 0.50 or higher, indicating that the construct explains more than 50% of the variance of its indicators. The analysis shows that the AVE values ranged from 0.634 (Competency Support/X1) to 0.834 (Innovation Ecosystem/Y3). Since all AVE values are well above 0.50, the convergent validity of the measurement model is fully established.

Table 2. Construct Reliability Test

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
X1	0.884	0.889	0.912	0.634
X2	0.881	0.892	0.918	0.738
X3	0.929	0.929	0.950	0.825
Y1	0.930	0.931	0.947	0.781
Y2	0.950	0.951	0.961	0.833
Y3	0.934	0.935	0.953	0.834

Source: Author, 2026

Structural Model Assessment

Structural model test is the next stage to evaluate the inner model by examining the Coefficient of Determination (R^2) and the path coefficients. To test the proposed hypotheses, a bootstrapping procedure with 5,000 subsamples was conducted. The significance of the path coefficients was determined using T-statistics (> 1.96 for a two-tailed test) and P-values (< 0.05). The results of the path analysis are detailed in Figure 1 (Structural Model) and Table 3 (Path Coefficients).

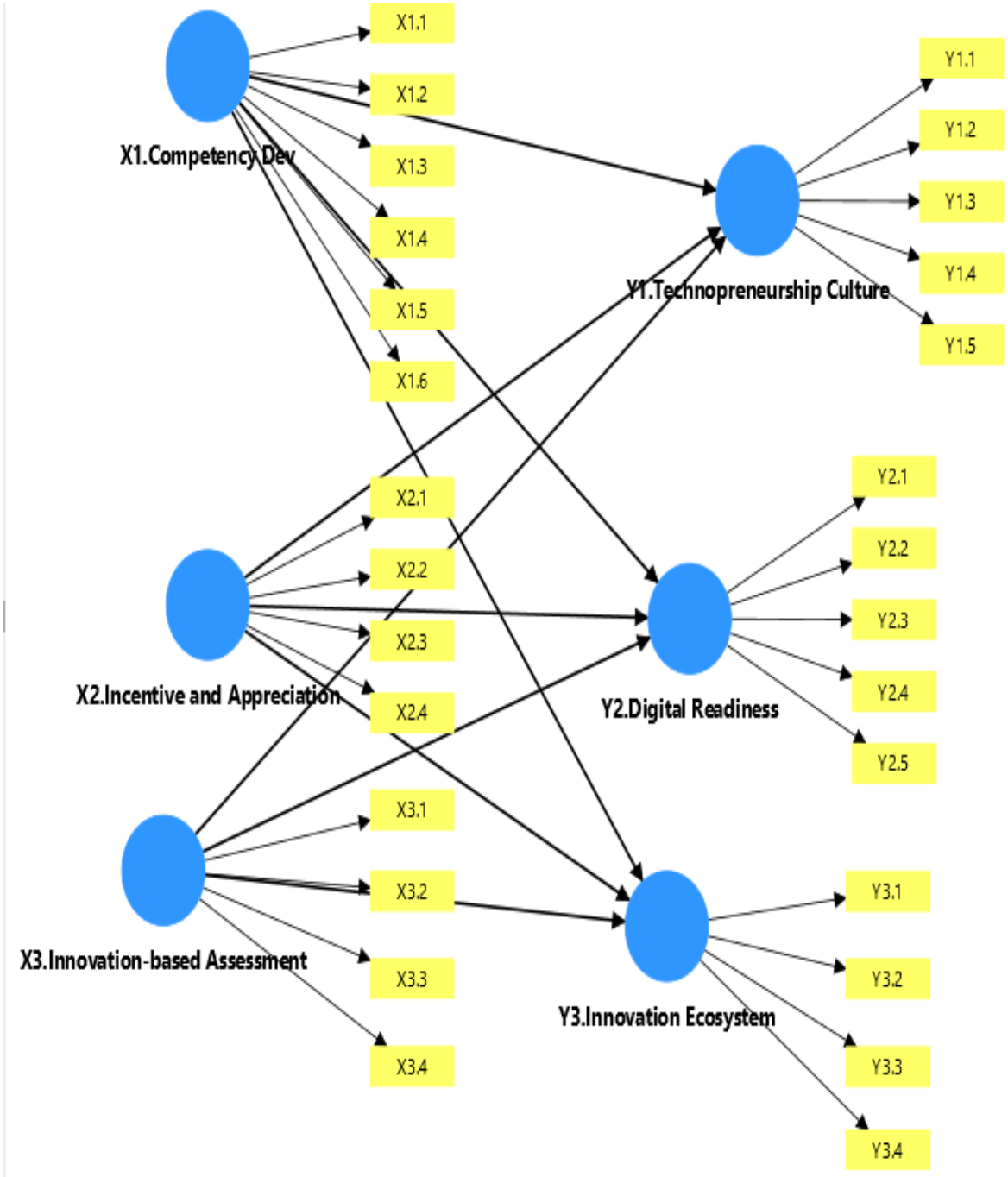

Figure 1. Structural Model

Table 3. Path Coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
X1-> Y1	-0.014	-0.012	0.189	0.075	0.940
X1-> Y2	0.184	0.198	0.156	1.181	0.238
X1-> Y3	0.243	0.255	0.161	1.512	0.131
X2-> Y1	0.576	0.577	0.162	3.567	0.000
X2-> Y2	0.512	0.513	0.124	4.123	0.000
X2-> Y3	0.398	0.399	0.142	2.797	0.005
X3-> Y1	0.357	0.355	0.157	2.275	0.023
X3-> Y2	0.215	0.201	0.144	1.496	0.135
X3-> Y3	0.244	0.233	0.155	1.578	0.115

Source: Author, 2026

Contrary to theoretical expectations, the results indicate that Competency Development Support (X1) does not have a significant influence on any of the transformation dimensions. Specifically, X1 failed to predict Technopreneurship Culture (β = -0.014, p = 0.940), Digital Readiness (β = 0.184, p = 0.238), and the Innovation Ecosystem (β = 0.243, p = 0.131). Consequently, the hypotheses associated with X1 are rejected.

In contrast, Incentive and Appreciation Support (X2) emerged as the most dominant driver in the model. The analysis confirms a strong positive and significant relationship between X2 and Technopreneurship Culture (β = 0.576, p = 0.000), Digital Readiness (β = 0.512, p = 0.000), and the Innovation Ecosystem (β = 0.398, p = 0.005). Thus, all hypotheses regarding X2 are fully supported.

The results for Innovation-based Assessment (X3) present a partial influence. X3 was found to have a significant positive impact on Technopreneurship Culture (β = 0.357, p = 0.023). However, its influence on Digital Readiness (β = 0.215, p = 0.135) and the Innovation Ecosystem (β = 0.244, p = 0.115) was statistically insignificant. Therefore, the hypothesis for X3 is partially supported.

Discussion

The goal of this study was to find out how student-centred human resource management practices influenced the evolution of student entrepreneurship. The proposed model explains 77.0 percent of the variance in Technopreneurship Culture, 75.6 percent in Digital Readiness, and 70.7 percent in the Innovation Ecosystem, according to statistical analysis. The fact that these R^2 values are higher than the 0.67 cutoff indicates that the incorporation of HRM practices into the student context is a reliable framework for predicting outcomes in digital entrepreneurship (Esposito Vinzi et al., 2022). The path analysis, on the other hand, reveals a nuanced and unexpected reality regarding the practices that drive this transformation.

Table 3.a Path Coefficient X1

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
X1-> Y1	-0.014	-0.012	0.189	0.075	0.940
X1-> Y2	0.184	0.198	0.156	1.181	0.238
X1-> Y3	0.243	0.255	0.161	1.512	0.131

Source: Author, 2026

The non-significant impact of Competency Development Support (X1) – as seen in Table 3.a - on all three dimensions [0.940 for X1→Y1, 0.238 for X2→Y2, 0,131 for X3→Y3] of technopreneurship transformation ($p > 0.05$) is one of this study's most intriguing findings. The Human Capital Theory which postulates that investment in education and training translates linearly into improved performance and economic outcomes (Kholifah et al., 2025), is challenged by this empirical evidence, which explicitly rejects H1. This relationship appears to be decoupled in the setting of student technopreneurship. We propose three theoretical explanations for this competency paradox.

First, the university may be able to successfully deliver competency programs (high input), but the transfer to the actual technology entrepreneurship ecosystem (output) is hindered. The decontextualization of the provided training is probably to blame for this obstruction. The support might be primarily focused on theoretical classroom learning or standardized workshops, which do not have the same level of environmental fidelity as digital startups, which are chaotic and agile (Wibowo et al., 2023; Hasan et al., 2024). As a result, students have the cognitive competence (also known as knowing that), but they lack the situated cognition (also known as knowing how) necessary to transform this competence into digital readiness or cultural change.

Second, it is possible that competency support has evolved into a "Hygiene Factor" rather than a "Motivator" in contemporary higher education. As digital natives, students may view access to competency development, such as coding workshops and business seminars, as a standard facility that the university must provide in the digital age. Although its presence prevents dissatisfaction, it does not inherently inspire them to alter their culture or behaviour. In contrast, the significant impact of incentives (X2) suggests that motivators, such as recognition and rewards, are the actual drivers of transformation, while competence is merely a passive requirement.

Third, the non-significance may be indicative of decoupling from an Institutional Theory perspective (Katou & Kafetzopoulos, 2025). The competency programs at the university might be supply-driven rather than demand-driven in that they are designed primarily to meet administrative accreditation requirements. The competency support becomes obsolete upon delivery if the curriculum and training modules lag the industry's rapid technological shifts. Students may disengage from the formal support system when they realize this gap, rendering the variable statistically insignificant in predicting their readiness or engagement with the ecosystem.

Table 3.b Path Coefficients X2

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
X2-> Y1	0.576	0.577	0.162	3.567	0.000
X2-> Y2	0.512	0.513	0.124	4.123	0.000
X2-> Y3	0.398	0.399	0.142	2.797	0.005

Source: Author, 2026

According to the empirical findings in Table 3.b, Incentive and Appreciation Support (X2) is the most potent driver in the student-HRM framework. It has a significant positive impact on all three dependent variables—the Innovation Ecosystem, Digital Readiness, and Technopreneurship Culture—with a p value of less than 0.05. The widespread effect of this variable suggests that students' transformation into technopreneurs is more than just a learning process; it is also a high-stakes decision about how to allocate resources. We use three distinct theoretical explanations to look at this dominance.

First, technopreneurship necessitates a significant investment of time, mental effort, and frequently financial resources, which competes directly with academic responsibilities, such as: maintaining a GPA. Technopreneurship has perceived opportunity cost is high without incentives. The findings suggest that Incentive Support (X2) works as a crucial risk-reduction mechanism. Examples of this include seed funding, priority for scholarships, or turning startup activities into academic credits. By creating a safety net, these incentives lower the entry barrier. Students are more willing to invest their resources in developing digital readiness and participating in the ecosystem when the university takes on some of the risk—whether financial or academic.

Second, although the guiding principles of Social Exchange Theory (SET) tend to underscore the importance of the principle of reciprocity in social structures, modern breakthroughs indicate that within intricate business ecologies, such as technopreneurial institutions of higher learning, these transactions ascend into more intricate and innovative relationships (Madison et al., 2025). In this research, SET is strengthened by the strong influence of X2. In contrast to competency support (X1), which is frequently thought of as a one-to-one service delivery, Incentive and Appreciation support creates a psychological contract between the two parties. A social exchange is started when the university shows its appreciation in a tangible way, such as through awards or public recognition. Students feel obligated to demonstrate greater commitment in return for this institutional investment. Extra-role behaviours such as actively contributing to the innovation ecosystem (Y3) and internalizing the technopreneurial culture (Y1), are manifestations of this reciprocity. According to the data, there is a strong transactional relationship between high support and high performance in the context of student innovation.

Third, technopreneurship can be viewed as an extra-curricular activity in an academic setting that is frequently dominated by grades and research as traditional metrics. The university sends a strong signal of legitimacy by instituting Appreciation Support (X2). The incentives send a message to the student body that innovation is more than just a hobby at the school. Incentives serve a symbolic purpose beyond their material value (Dang & Nguyen

Viet, 2021). Students who receive this validation are more likely to adopt the Technopreneur Identity (Culture) and improve their readiness to join the institution's valued hierarchy. X2 effectively transforms technopreneurship from a sideline activity to a major academic endeavour.

Table 3.c Path Coefficients X3

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
X3-> Y1	0.357	0.355	0.157	2.275	0.023
X3-> Y2	0.215	0.201	0.144	1.496	0.135
X3-> Y3	0.244	0.233	0.155	1.578	0.115

Source: Author, 2026

A striking functional dichotomy is revealed by the Innovation-based Assessment Support (X3) findings. Even though this variable has a significant impact on Technopreneurship Culture (Y1, $p < 0.05$), it has no significant impact on Digital Readiness (Y2) namely $p = 0.135$ (in Table 3. c) or the Innovation Ecosystem (Y3) with $p = 0.115$ (in Table 3. c). This partial success suggests that higher education assessment systems are effective as tools for cultural engineering but fail to build capacity.

Through the lens of Institutional Theory, specifically the idea of Coercive Isomorphism, it is possible to explain the significant impact that Assessment has had on Culture (Y1) In the university, assessment systems represent the game rules. Students are subjected to formal pressure when the educational establishment incorporates innovation metrics into grading schemes (for example, evaluating creativity, novelty, or risk-taking). Students are compelled to adopt the institution's values and mindsets to maintain academic survival (grades). As a result, the Technopreneurship Culture that is being observed here is probably the result of rational compliance. Students internalize the culture not because they have the skills, but rather because the assessment structure requires them to be innovative to succeed.

The failure of Assessment to influence Digital Readiness (Y2) underlines a basic limitation of performance measurement. Assessment is a thermometer, not the medicine. In terms of the Input-Process-Output model, assessment is generally a lagging indicator as it measures the result of learning after it has taken place. The act of measuring a student's digital potential does not enhance that potential. Without effective training in place (which was found lacking in X1) or resources, high-stakes assessment may reveal gaps in digital readiness without offering the scaffolding to close them. While students may value innovation (Culture) because assessment places pressure on them to do so, they are technically unprepared in terms of Readiness because the assessment system demands output without supplying the necessary input.

A misalignment in the unit of analysis can be seen in the Assessment on the Innovation Ecosystem (Y3)'s lack of significance. Individualistic assessments (such as individual GPAs and assignments) make up most traditional academic assessments. Boundary-spanning, collaboration, and network density are required in an ecosystem. A Silo Effect is created when the assessment metrics emphasize individual achievement rather than collective impact or external networking. Instead of participating in the larger, frequently messy collaborative work required to build an ecosystem, students focus on improving their own grades. This

suggests that the design of the current assessment is too focused on the inside to encourage the external connectivity that is necessary for an ecosystem to thrive.

The findings bring actionable insights for university administrators seeking to create a technopreneurial campus. The insignificance of competency support (X1) is a wake-up call to reassess the effectiveness of existing training programs. Universities need to shift away from a quantity-based approach-in terms of the number of seminars conducted-to a quality-impact approach. More importantly, the study calls for a strategic reallocation of resources. Given the overwhelming influence of Incentives (X2), administrators need to focus more on developing reward mechanisms, such as converting key startup milestones into academic credits or offering competitive grants, over traditional classroom-based training. Furthermore, while Innovation Assessment (X3) is helpful in driving culture, it needs to be supplemented by pragmatic mentoring and external networking programs that ensure the culture leads to real readiness and ecosystem engagement.

CONCLUSION

The purpose of this study was to investigate the effectiveness of the student-HRM framework in promoting technological entrepreneurship in higher education. Over 70% of the variation in student culture, readiness, and ecosystem engagement can be attributed to the structural model assessment's significant predictive power. This study's overall conclusion is that motivation is more important than instruction. Incentive and Appreciation Support (X2) emerged as the primary driver among the three support mechanisms, successfully influencing all transformation dimensions. Competency Development Support (X1), on the other hand, was found to be ineffective and had no significant impact. In contrast, Innovation-based Assessment (X3) serves primarily as a cultural enforcer but does not have the capacity to construct ecosystem networks or technical readiness.

Theoretically, the application of Human Capital Theory to student entrepreneurship is fundamentally corrected by this study. The knowing-doing gap in digital transformation cannot be bridged by simply providing knowledge assets (competency training), as shown by our empirical evidence. Instead, the findings strongly support Signalling Theory and Social Exchange Theory, indicating that students respond more actively to institutional signals (appreciation) and risk-mitigation mechanisms (incentives) than to educational inputs alone. This suggests a paradigm shift, namely student technopreneurship is more about a lack of motivation than a deficit in learning.

For university policymakers, the ‘more training is better’ mantra needs to be retired now. This means resources should, therefore, be used judiciously and shifted away from generic seminars and workshops to setting up appropriate Incentive Systems. We recommend that universities should give seed funding and conversion to academic credit to reduce the opportunity cost for students; While innovation-based grading is necessary to shape culture, it needs to be complemented by universities’ practical mentoring, not mere scoring, to guarantee skill readiness; and at last, competency programs need to be industry-driven to avoid irrelevance, as seen in this study.

This study has some limitations, despite its contributions. First, we are unable to infer causality over time due to the cross-sectional design; a longitudinal study would better capture the progression of student transformation. Second, the study was carried out within a specific cultural setting; in future studies, this model should be tested in a variety of nations to determine its generalizability. Finally, future research should investigate the role of informal mentoring or peer-learning as potential alternative mediators that might be more effective than formal training considering the failure of formal competency support.

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