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THE IMPACT OF COMPREHENSIVE QUALITY OF STUDENTS AND DEVELOP SKILLS AS THE MARKET DEMANDS ON PERFORMANCE OF STUDENTS: A STUDY OF THE MEDIATING ROLE OF MANAGEMENT INNOVATION

O IMPACTO DA QUALIDADE INTEGRAL DOS ALUNOS E DO DESENVOLVIMENTO DE COMPETÊNCIAS CONFORME AS EXIGÊNCIAS DO MERCADO NO DESEMPENHO DOS ESTUDANTES: UM ESTUDO SOBRE O PAPEL MEDIADOR DA INOVAÇÃO EM GESTÃO

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Abstract
This study explores the impact of Comprehensive Quality of Students and Development of Skills as the Market Demands on Student Performance, with a focus on the mediating role of Management Innovation. A quantitative research approach was adopted, and data were collected through questionnaires from 300 samples of students in higher education institutions across major Chinese cities. The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the hypothesized relationships. The results provide valuable implications for educational institutions and policymakers. For institutions, integrating management innovation into educational strategies can optimize the cultivation of comprehensive quality and market-demanded skills, thereby boosting student performance. For policymakers, promoting management innovation in education systems can enhance the effectiveness of talent development and bridge the gap between education and industry requirements in an increasingly competitive knowledge economy.

Keywords: Student Performance. Comprehensive Student Quality. Market-Oriented Skills. Management Innovation. PLS-SEM Analysis.

Resumo
Este estudo explora o impacto da qualidade integral dos alunos e do desenvolvimento de competências exigidas pelo mercado no desempenho dos alunos, com foco no papel mediador da inovação em gestão. Foi adotada uma abordagem de pesquisa quantitativa, e os dados foram coletados por meio de questionários aplicados a uma amostra de 300 alunos de instituições de ensino superior nas principais cidades chinesas. Os dados coletados foram analisados utilizando o modelo de equações estruturais por mínimos quadrados parciais (PLS-SEM) para testar as relações hipotéticas. Os resultados fornecem implicações valiosas para instituições de ensino e formuladores de políticas. Para as instituições, integrar a inovação em gestão às estratégias educacionais pode otimizar o desenvolvimento da qualidade integral e das competências exigidas pelo mercado, impulsionando assim o desempenho dos alunos. Para os formuladores de políticas, promover a inovação em gestão nos sistemas educacionais pode aumentar a eficácia do desenvolvimento de talentos e preencher a lacuna entre a educação e as exigências da indústria em uma economia do conhecimento cada vez mais competitiva.

Palavras-chave: *Desempenho do aluno. Qualidade Abrangente do Aluno. Habilidades*

Orientadas para o Mercado. Inovação em Gestão. Análise PLS-SEM.

1 INTRODUCTION

This study explores the relationships between students' comprehensive quality, acquisition of market-oriented skills, and academic performance, with special attention to the mediating role of management innovation within educational institutions.

Universities act as bridges between academic learning and professional practice. Understanding how comprehensive student development and skill training linked to market needs affect performance can inform strategies to strengthen educational effectiveness and graduate employability. Comprehensive quality includes academic excellence, critical thinking, communication, and adaptability, while market-demanded skills focus on digital literacy, teamwork, problem-solving, and innovation. Management innovation—new administrative methods, teaching techniques, and technology integration—can play a vital mediating role.

Clarifying these relationships offers valuable guidance for optimizing university programs, enhancing student learning, and improving institutional competitiveness, all crucial for continuous advancement in education amid rapid technological and economic change.

1.1 Research background

Educational technology and pedagogical innovation have transformed student development in higher education globally (Al-Fraihat *et al*., 2020). The approaches to developing comprehensive quality and market-demanded skills have evolved considerably with these innovations (Rashid & Asghar, 2016). Institutions increasingly recognize the value of combining comprehensive development with market-oriented training to improve learning outcomes and employability.

This study analyzes how management innovation mediates the integration of comprehensive quality development with market-demanded skills training and their

collective impact on student performance. By examining implementation barriers (Brunetti *et al*., 2020), this research aims to provide insights into practical challenges.

Comprehensive quality includes academic achievement, critical thinking, communication skills, and adaptability—all essential in today's job market (Succi & Canovi, 2020). Market-demanded skills encompass employer-sought competencies like digital literacy and problem-solving capabilities (Hora *et al*., 2020). Management innovation serves as a critical mediating factor enhancing the effectiveness of these development initiatives.

1.2 Statement problem

Bridgstock (2009) highlighted the importance of comprehensive quality development and skill acquisition for students to improve employability outcomes. Applying innovative pedagogical approaches and effective competency-based education are becoming critical elements for the performance of students, which contributes to economic development and workforce readiness (Tomlinson,2017). Integrating comprehensive quality development and market-demanded skills allows a change from traditional educational methods into adaptive learning patterns which could significantly boost student performance (Hora *et al*., 2018). Through innovative educational strategies institutions can implement frameworks for developing student competencies while decreasing skill gaps (Hora *et al*., 2018; Succi & Canovi, 2020). However, the integration of comprehensive quality development and market-demanded skill training remains underexplored.

1.3 Research gap

This research aims to address this gap by examining relationships between comprehensive quality development, market-demanded skills, management innovation, and student performance in higher education. By gathering empirical evidence from students, the study will provide insights into practical applications and challenges institutions face when implementing comprehensive quality development (Mason *et al*., 2009). Developing an integrated educational model based on management innovation

could transform how institutions operate, enabling more effective and competitive programs that maintain excellence in an increasingly dynamic job market (Yorke, 2006).

1.4 Research question

- How to quantify the specific impact of comprehensive quality development and market-demanded skill training on the performance of students across different academic disciplines and educational levels in higher education institutions?
- What is the role of management innovation in connecting comprehensive quality development, market-demanded skills and student performance, especially whether it plays an intermediary role?

1.5 Research objective

- To quantify the specific impact of comprehensive quality development and market-demanded skill training on the performance of students across different academic disciplines and educational levels in higher education institutions.
- To examine the mediating role of management innovation in the relationship between comprehensive quality development, market-demanded skills, and student performance.

2 LITERATURE REVIEW

2.1 Underpinning theories

Three primary theories support this research: Resource-Based View, Human Capital Theory, and Innovation Management Theory.

The Resource-Based View suggests that valuable, rare, inimitable, and non-substitutable resources enable sustained competitive advantage and superior institutional performance (Barney, 1991; Peteraf & Barney, 2003). In education, intangible resources like educational culture and teaching capabilities serve as strategic assets, while tangible

resources provide only temporary benefits (Grant, 1991). This framework has been extensively used to examine drivers of educational performance outcomes (Teece, 2007).

Human Capital Theory addresses an institution's ability to develop, integrate, and enhance student competencies to meet changing market demands (Becker, 1964). This perspective explains how educational institutions sustain competitive advantages by aligning resources with evolving industry requirements (Schultz, 1961). Studies show that comprehensive quality enhancement, skill adaptability, and competency leadership improve institutional sustainability and effectiveness (Mincer, 1974).

Innovation Management Theory emphasizes the need for educational institutions to proactively identify and implement innovative approaches for long-term sustainability (Tidd & Bessant, 2018; Dodgson *et al*., 2008). Effective educational innovation management integrates pedagogical considerations into strategic planning, curriculum design, and instruction.

Together, these theories provide valuable insights into the complex mechanisms underlying student performance in today's dynamic educational environment.

2.2 Comprehensive quality of students

Present literature shows comprehensive student quality as multidimensional, encompassing academic achievement, cognitive skills, interpersonal abilities, and personal development (Römgens *et al*., 2020). Modern educational research emphasizes holistic, competency-based frameworks for measuring and enhancing student quality (Tymon *et al*., 2023; Pang *et al*., 2022).

Current studies identify four key dimensions of comprehensive quality: academic proficiency, critical thinking & problem-solving, communication & teamwork, and personal attributes (Römgens *et al*., 2020; Tymon *et al*., 2023). Academic proficiency covers knowledge mastery and evidence-based reasoning; critical thinking dimensions assess analytical abilities and innovation in various contexts (van Laar *et al*., 2020); communication and teamwork skills enable effective collaboration in multicultural environments (Pang *et al*., 2022); and personal attributes like adaptability and resilience help students manage challenges and pursue continuous improvement (Cheng *et al*., 2022).

The increased focus on employability has prompted universities to adopt multidimensional frameworks that integrate market-demanded competencies into curricula (Pang *et al*., 2022; Tymon *et al*., 2023), ensuring students develop not just academic excellence but also readiness for professional environments and lifelong learning.

2.3 Develop skills as the market demands

Present literature identifies market-demanded skill development as crucial for ensuring graduate employability and institutional competitiveness (Wickramasinghe & Perera, 2010). This market-oriented approach helps bridge the gap between academic learning and industry requirements.

Research highlights four key dimensions of market-demanded skills: technical competencies, soft skills, digital literacy, and adaptability capabilities (Succi & Canovi, 2020; Andrews & Higson, 2008; Osmani *et al*., 2015). Technical competencies encompass job-specific knowledge measured through professional certifications and specialized expertise. Soft skills reflect interpersonal abilities valued by employers, including critical thinking, teamwork, leadership, and problem-solving, developed through experiential learning and collaborative projects (Robles, 2012). Digital literacy covers technology proficiency, data analysis capabilities, and digital communication skills essential for digitized workplaces. Adaptability capabilities measure flexibility and continuous learning orientation needed for navigating changing market conditions.

By implementing industry partnerships, internships, and real-world projects, educational institutions can enhance market responsiveness, potentially improving graduate employment outcomes and strengthening institutional reputation in the competitive education landscape.

2.4 Management innovation

Present literature defines management innovation as novel management practices, organizational processes, and administrative techniques that enhance organizational effectiveness (Birkinshaw *et al*., 2008). It serves as a critical driver for organizational adaptation and competitive advantage in dynamic environments.

Research identifies four key dimensions of management innovation: process innovation, structural innovation, strategic innovation, and cultural innovation (Damanpour & Aravind, 2012; Mol & Birkinshaw, 2009; Hamel, 2006). Process innovation enhances operational efficiency through workflow redesign, improved decision-making procedures, and communication systems. Structural innovation focuses on organizational design through new organizational forms, reporting relationships, and authority distribution (Armbruster *et al*., 2008). Strategic innovation encompasses planning methodologies, resource allocation approaches, and performance measurement systems that help organizations navigate competitive landscapes. Cultural innovation transforms organizational values, beliefs, and behavioral norms.

By implementing change management programs, leadership development initiatives, employee engagement practices, and knowledge sharing systems, organizations can foster innovative cultures that enhance adaptability and improve performance in rapidly changing environments.

2.5 Performance of students

Present literature describes student performance as combining academic achievement, skill development, and personal growth outcomes (Kuh *et al*., 2006). Comprehensive assessment frameworks are considered essential for effectively measuring and evaluating student performance.

Research identifies four key dimensions of student performance: academic achievement, skill acquisition, personal development, and career readiness (York *et al*., 2015; Pascarella & Terenzini, 2005; Astin, 1993). Academic achievement measures learning outcomes through grade point average, course completion rates, and standardized test scores. Skill acquisition assesses competency development in critical

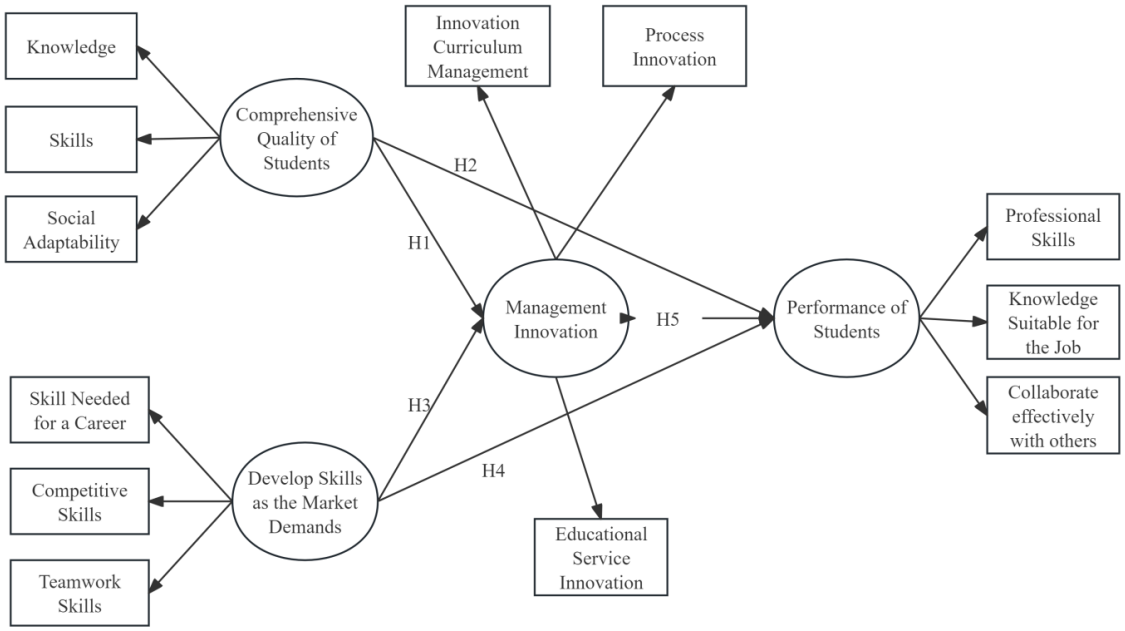
thinking, problem-solving, communication, and technical proficiencies through experiential learning and applied knowledge demonstrations (Arum & Roksa, 2011). Personal development tracks self-efficacy, motivation, social integration, and psychological well-being to indicate holistic growth. Career readiness evaluates preparation for professional success and lifelong learning.

By implementing internship programs, career counseling, professional development workshops, and industry engagement initiatives, educational institutions can enhance employment outcomes, potentially improving graduate career prospects and strengthening institutional reputation in competitive higher education markets.

2.6 Conceptual framework

Figure 1

Conceptual Framework



2.7 Hypothesis

H1: The Comprehensive Quality of Students has a significant positive effect on Management Innovation.

H2: The Comprehensive Quality of Students has a significant positive impact on the Performance of Students.

H3: Developing Skills according to Market Demand has a significant positive influence on Management Innovation.

H4: Developing Skills according to Market Demand has a significant positive effect on the Performance of Students.

H5: Management Innovation has a significant positive impact on the Performance of Students.

3 METHODOLOGY

3.1 Research instrument and data

In this research, cross-sectional research with quantitative study is employed to investigate the factors influencing performance of students. This type of observation design describes the general situation at one point in time among targeted population.

3.2 Measures

This field survey captures current educational management practices and student development approaches across Chinese higher education institutions. The data will be analyzed using partial least squares structural equation modeling to examine conceptual framework relationships.

The survey uses validated measures from prior research: The Comprehensive Quality of Students construct employs items from Douglas *et al*. (2015), assessing academic competence, critical thinking, and holistic development. Develop Skills as the Market Demands incorporates scales from Wickramasinghe and Perera (2010), evaluating alignment between educational programs and industry requirements. Management Innovation combines metrics from Birkinshaw *et al*. (2008), measuring institutions' capacity for pedagogical innovation, administrative reform, and strategic adaptation. Performance of Students metrics are adapted from Kuh *et al*. (2006), measuring academic achievement, skill acquisition, and career readiness. The mediating

role assessment uses validated approaches from Baron and Kenny (1986) to examine indirect effects.

By using these validated scales aligned with research objectives, the measurement approach ensures reliability and validity in examining relationships between student quality development, market-oriented training, management innovation, and performance outcomes.

4 DATA ANALYSIS AND RESULT

The empirical analysis was conducted utilizing SmartPLS 4.0 software through the application of Partial Least Squares Structural Equation Modeling (PLS-SEM) methodology and blindfolding techniques to examine the proposed hypotheses. The analytical approach encompassed both measurement model evaluation and structural model examination. Additionally, the model's forecasting accuracy was validated through the implementation of PLSpredict analytical procedures.

4.1 Assessment of the measurement model

Tables 1 and 2 present an assessment of internal consistency reliability and convergent validity for first-order and second-order constructs. Cronbach's alpha values ranged from 0.876 to 0.900 (first-order) and 0.895 to 0.901 (second-order), while composite reliability values ranged from 0.876 to 0.900 (first-order) and 0.812 to 0.823 (second-order). All values exceed the recommended 0.70 threshold, indicating satisfactory internal consistency reliability.

Average Variance Extracted values ranged from 0.668 to 0.714 (first-order) and 0.591 to 0.608 (second-order), all above the recommended 0.50 level for establishing convergent validity. Factor loadings were all above 0.70, with first-order loadings ranging from 0.807 to 0.851 and second-order loadings from 0.748 to 0.806, further demonstrating convergent validity (Nunnally & Bernstein 1994; Hair *et al* 2019).

Among first-order constructs, Process Innovation showed the highest reliability ($\alpha = 0.900$, CR = 0.900, AVE = 0.714), while Competitive Skills achieved the highest AVE (0.706). For second-order constructs, Develop Skills as the Market Demands

exhibited the strongest reliability (α = 0.901, CR = 0.822), while Comprehensive Quality of Students demonstrated the highest AVE (0.608).

These results confirm that both measurement models possess adequate reliability and convergent validity for structural equation modeling analysis.

Table 1

Reliability and Convergent Validity of First Order Variables

First Order Constructs	Items	Loadings	Cronbach's alpha	CR (rho_a)	AVE
Knowledge (KN)	KN1	0.817	0.876	0.876	0.668
	KN2	0.815			
	KN3	0.812			
	KN4	0.832			
	KN5	0.809			
Skills (SK)	SK1	0.835	0.885	0.886	0.686
	SK2	0.808			
	SK3	0.832			
	SK4	0.828			
	SK5	0.837			
Social Adaptability (SA)	SA1	0.807	0.886	0.887	0.687
	SA2	0.827			
	SA3	0.842			
	SA4	0.828			
	SA5	0.841			
Skills Needed for a Career (SNC)	PW2	0.839	0.892	0.892	0.697
	PW3	0.837			
	PW4	0.832			
	PW5	0.848			
	SNC1	0.842			
	SNC2	0.842			
	SNC3	0.826			
	SNC4	0.832			
	SNC5	0.833			
Competitive Skills (CS)	CS1	0.848	0.896	0.896	0.706
	CS2	0.850			
	CS3	0.817			
	CS4	0.842			
	CS5	0.842			
Teamwork Skills (TS)	TS1	0.830	0.879	0.879	0.673
	TS2	0.813			
	TS3	0.819			
	TS4	0.826			
	TS5	0.813			
Innovation Curriculum Management (ICM)	ICM1	0.829	0.876	0.877	0.669
	ICM2	0.808			
	ICM3	0.825			
	ICM4	0.817			
	ICM5	0.811			
Process Innovation (PI)	PI1	0.846	0.9	0.900	0.714
	PI2	0.848			
	PI3	0.837			

	PI4	0.842			
	PI5	0.851			
	ESI1	0.822			
Educational Service Innovation (ESI)	ESI2	0.825			
	ESI3	0.814	0.882	0.883	0.680
	ESI4	0.832			
	ESI5	0.829			
	PS1	0.825			
Professional Skilled (PS)	PS2	0.819			
	PS3	0.834	0.882	0.882	0.678
	PS4	0.829			
	PS5	0.811			
	KSJ1	0.827			
Knowledge Suitable for the Job (KSJ)	KSJ2	0.832			
	KSJ3	0.833	0.887	0.888	0.690
	KSJ4	0.823			
	KSJ5	0.836			
	CEO1	0.845			
Collaborate Effectively with Others (CEO)	CEO2	0.814			
	CEO3	0.821	0.887	0.887	0.688
	CEO4	0.829			
	CEO5	0.838			

Table 2

Reliability and Convergent Validity of Second Order Variables

Second Order Constructs	Items	Loadings	Cronbach's alpha	CR (rho_a)	AVE
Comprehensive Quality of Students (CQS)	KN	0.761			
	SK	0.806	0.899	0.823	0.608
	SA	0.771			
Develop Skills as the Market Demands (DSMD)	SNC	0.790			
	CS	0.780	0.901	0.822	0.606
	TS	0.766			
Management Innovation (MAIN)	ICM	0.778			
	PI	0.774	0.895	0.812	0.591
	ESI	0.753			
Performance of Students （PEST）	PS	0.748			
	KSJ	0.796	0.899	0.822	0.607
	CEO	0.792			

The Fornell-Larcker criterion requires that the square root of average variance extracted (AVE) for each construct should exceed its highest correlation with any other construct in the model (Fornell & Larcker, 1981).

Table 3 displays this as bolded diagonal elements representing square roots of average variance extracted for each construct while off-diagonal elements represent correlations among them. The square root of AVE values ranged from 0.817 to 0.845 across all constructs, with Process Innovation (PI) showing the highest value (0.845) and Knowledge (KN) displaying the lowest value (0.817). The highest inter-construct correlation was observed between Skills (SK) and Knowledge Suitable for the Job (KSJ) at 0.456, while the lowest correlation was found between Process Innovation (PI) and Collaborate Effectively with Others (CEO) at 0.350. Results showed that every construct in Table 3 had a greater square root of average variance extracted than its highest correlation with other constructs in the model, suggesting adequate discriminant validity within the measurement model. For instance, the Skills construct (SK) had a square root of AVE of 0.828, which exceeded its highest correlation of 0.456 with KSJ, and similarly, all other constructs demonstrated the same pattern, confirming that each construct shares more variance with its own indicators than with any other construct in the model.

Table 3

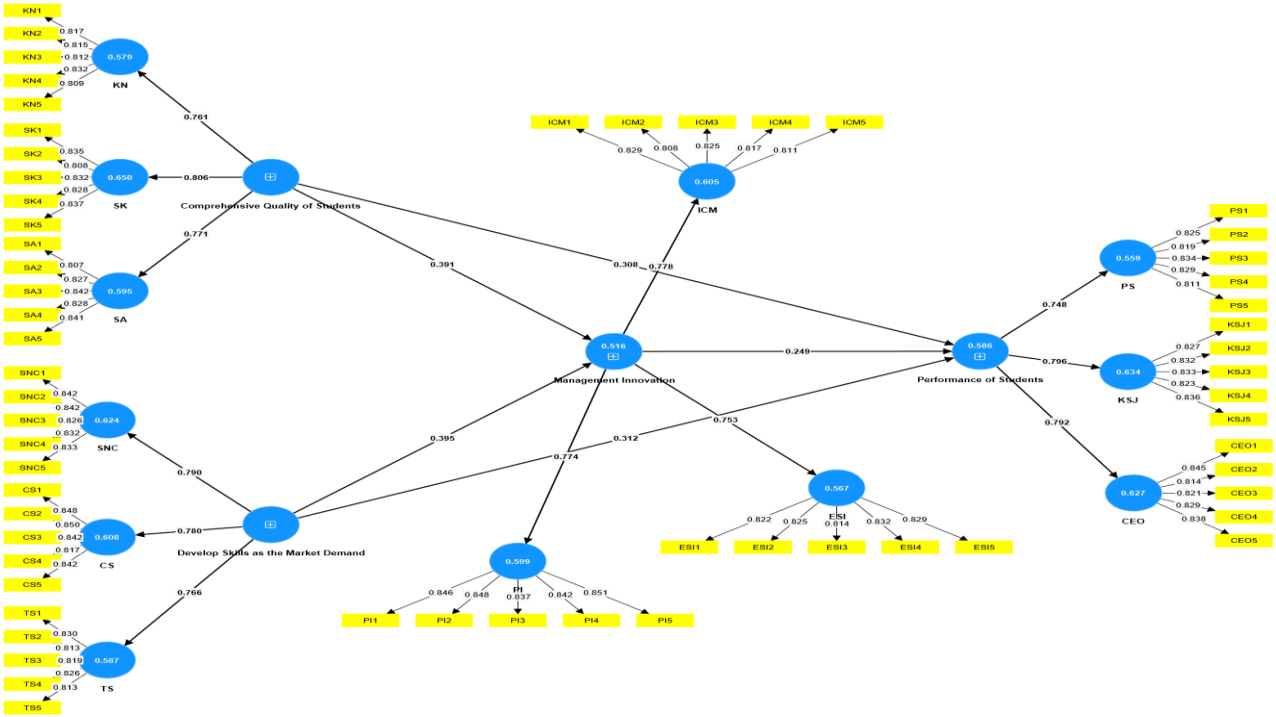
Discriminant Validity - Fornell-Larcker Criterion

	CEO	CS	ESI	ICM	KN	KSJ	PI	PS	SA	SK	SNC	TS
CEO	0.830											
CS	0.454	0.840										
ESI	0.426	0.392	0.824									
ICM	0.399	0.404	0.395	0.818								
KN	0.392	0.438	0.388	0.377	0.817							
KSJ	0.452	0.419	0.391	0.411	0.399	0.830						
PI	0.350	0.418	0.354	0.408	0.367	0.425	0.845					
PS	0.386	0.444	0.397	0.333	0.371	0.392	0.397	0.824				
SA	0.391	0.404	0.366	0.378	0.377	0.448	0.393	0.396	0.829			
SK	0.443	0.449	0.429	0.418	0.430	0.456	0.415	0.416	0.428	0.828		
SNC	0.423	0.410	0.390	0.378	0.406	0.429	0.413	0.394	0.373	0.430	0.835	
TS	0.435	0.393	0.395	0.398	0.396	0.370	0.347	0.350	0.349	0.424	0.426	0.820

4.2 Assessment of structural model

Figure 2

Structural Model Results



Tables 4 and 5 illustrate significant direct and indirect effects in the hypothesis testing results. For direct effects, Comprehensive Quality of Students positively impacts Performance of Students (β=0.308, p<0.001) and Management Innovation (β=0.391, p<0.001), supporting H1 and H2. Develop Skills as the Market Demand similarly shows positive effects on Management Innovation (β=0.395, p<0.001) and Performance of Students (β=0.312, p<0.001), supporting H3 and H4. Management Innovation positively affects Performance of Students (β=0.249, p<0.001), supporting H5.

These findings demonstrate that both comprehensive student quality development and market-oriented skill development enhance student performance by facilitating management innovation within educational institutions. Management innovation serves as a crucial mediating mechanism linking quality development and market-oriented training to improved student performance outcomes.

Table 4

Hypothesis Test - Direct Effects

	Hypothesis	Original sample (O)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
H1	Comprehensive Quality of Students -> Management Innovation	0.391	0.036	10.815	0.000	Accepted
H2	Comprehensive Quality of Students -> Performance of Students	0.308	0.038	8.189	0.000	Accepted
H3	Develop Skills as the Market Demand -> Management Innovation	0.395	0.037	10.796	0.000	Accepted
H4	Develop Skills as the Market Demand -> Performance of Students	0.312	0.039	8.050	0.000	Accepted
H5	Management Innovation -> Performance of Students	0.249	0.038	6.470	0.000	Accepted

Table 5

Hypothesis Test - Mediating Effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Comprehensive Quality of Students -> Management Innovation -> Performance of Students	0.097	0.097	0.017	5.687	0.000
Develop Skills as the Market Demand -> Management Innovation -> Performance of Students	0.098	0.098	0.018	5.484	0.000

According to Hair *et al*. (2019), R^2 values of 0.75, 0.50, and 0.25 represent substantial, moderate, and weak explanatory power respectively for endogenous latent variables.

Table 6 shows that Performance of Students has an R^2 of 0.586, indicating that its exogenous constructs (Comprehensive Quality of Students, Develop Skills as the Market Demand, and Management Innovation) explain 58.6% of variance - demonstrating moderate to substantial explanatory power. Management Innovation has an R^2 value of 0.516, showing that 51.6% of its variance is explained, indicating moderate explanatory power.

The adjusted R^2 values (0.584 for Performance of Students and 0.515 for Management Innovation) are very close to the original R^2 values, suggesting the models are not overfitted and maintain stable predictive accuracy. These results confirm that the

structural model has good explanatory power, particularly for student performance outcomes.

Table 6

Regression

	R-square	R-square adjusted
Performance of Students	0.586	0.584
Management Innovation	0.516	0.515

Table 7 shows effect size (f^2) values for exogenous latent variables, with Cohen's (1988) benchmarks of 0.02, 0.15, and 0.35 representing small, medium, and large effects respectively.

Comprehensive Quality of Students demonstrates medium effects on Management Innovation (f^2=0.147) and Performance of Students (f^2=0.107). Similarly, Develop Skills as the Market Demand shows medium effects on Management Innovation (f^2=0.15) and Performance of Students (f^2=0.109). Management Innovation has a small to medium effect on Performance of Students (f^2=0.072).

These results indicate substantial practical significance of both Comprehensive Quality of Students and Develop Skills as the Market Demand in predicting outcomes, while Management Innovation provides a meaningful but smaller contribution. The consistent medium effect sizes demonstrate that the model's structural relationships are practically significant and contribute meaningfully to explaining variance in the endogenous constructs.

Table 7

The Value of f^2

	Management Innovation	Performance of Students
Comprehensive Quality of Students	0.147	0.107
Develop Skills as the Market Demand	0.15	0.109
Management Innovation		0.072

5 DISCUSSION AND CONCLUSION

5.1 Discussion of main findings

This study developed and tested a conceptual framework examining how comprehensive student quality and market-demanded skills influence student performance, with management innovation as a mediator. Results provide strong empirical support for the hypothesized relationships.

Comprehensive Quality of Students showed significant positive direct effects on both Performance of Students ($\beta=0.308$, $p<0.001$) and Management Innovation ($\beta=0.391$, $p<0.001$). Similarly, Develop Skills as the Market Demand demonstrated significant positive direct effects on Performance of Students ($\beta=0.312$, $p<0.001$) and Management Innovation ($\beta=0.395$, $p<0.001$). Management Innovation ($\beta=0.249$, $p<0.001$) also positively predicted Performance of Students.

Analysis confirmed the mediating role of Management Innovation, with Comprehensive Quality of Students having indirect effects on Performance of Students through Management Innovation ($\beta=0.097$, $p<0.001$) and Develop Skills as the Market Demand showing similar indirect effects ($\beta=0.098$, $p<0.001$). All hypotheses (H1-H5) were fully supported.

These findings highlight how comprehensive student quality and market-demanded skills can promote student performance both directly and indirectly through management innovation within educational institutions.

5.2 Theoretical and practical implications

The results of this research offer valuable insights for educational policymakers and institutions in the region. By demonstrating how comprehensive student quality and market-demanded skills, combined with innovative management practices, can enhance student performance and competitive advantage, the study highlights the importance of systematic quality development programs. Implementing data-driven decision-making in curriculum design and assessment can help institutions operate more efficiently and better

address student needs, potentially encouraging wider adoption of these comprehensive approaches.

Through comprehensive student quality development, this research can help institutions strengthen their preparation practices. Systematic quality assessment enables early identification of learning gaps, allowing for strategic interventions. Comprehensive quality management facilitates real-time monitoring of student progress, adaptation to changing market demands, and improved educational outcomes. Timely feedback mechanisms help educators quickly identify emerging issues, minimizing learning difficulties and providing prompt support.

5.3 Limitations and future research

Although this study offers valuable insights into how comprehensive student quality and market-demanded skills enhance student performance through management innovation, several limitations warrant consideration.

First, the cross-sectional design limits causal inference. Observed relationships may be influenced by confounding variables or reverse causation. Longitudinal studies would better capture dynamic interactions and developmental trajectories over time.

Second, the study's specific educational context and geographic region may limit generalizability. Replication across diverse educational environments, academic disciplines, and cultural settings would strengthen external validity.

Third, reliance on self-reported student surveys introduces potential common method bias and social desirability effects. Future research should incorporate multiple data sources, including objective performance measures, instructor evaluations, employer assessments, and longitudinal tracking of graduate outcomes.

Despite these limitations, this study provides an important foundation for understanding how comprehensive student quality and market-demanded skills work through management innovation to enhance student performance, offering practical guidance to educational institutions preparing students for an increasingly competitive job market.

REFERENCES

Al-Fraihat, D., Joy, M., Masa'deh, R., & Sinclair, J. (2020). Evaluating e-learning systems success: An empirical study. *Computers in Human Behavior, 102*, 67–86. https://doi.org/10.1016/j.chb.2019.08.004

Andrews, J., & Higson, H. (2008). Graduate employability, "soft skills" versus "hard" business knowledge: A European study. *Higher Education in Europe, 33*(4), 411–422. https://doi.org/10.1080/03797720802522627

Armbruster, H., Bikfalvi, A., Kinkel, S., & Lay, G. (2008). Organizational innovation: The challenge of measuring non-technical innovation in large-scale surveys. *Technovation, 28*(10), 644–657. https://doi.org/10.1016/j.technovation.2008.03.003

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.

Birkinshaw, J., Hamel, G., & Mol, M. J. (2008). Management innovation. *Academy of Management Review, 33*(4), 825–845. https://doi.org/10.5465/amr.2008.34421969

Bridgstock, R. (2009). The graduate attributes we've overlooked: Enhancing graduate employability through career management skills. *Higher Education Research & Development, 28*(1), 31–44. https://doi.org/10.1080/07294360802444347

Cheng, M., Adekola, O., Albia, J., & Cai, S. (2022). Employability in higher education: A review of key stakeholders' perspectives. *Higher Education Evaluation and Development, 16*(1), 16–31.

Damanpour, F., & Aravind, D. (2012). Managerial innovation: Conceptions, processes and antecedents. *Management and Organization Review, 8*(2), 423–454. https://doi.org/10.1111/j.1740-8784.2011.00233.x

Dodgson, M., Gann, D., & Salter, A. (2008). *The management of technological innovation: Strategy and practice*. Oxford University Press.

Douglas, J., Douglas, A., McClelland, R. J., & Davies, J. (2015). Understanding student satisfaction and dissatisfaction: An interpretive study in the UK higher education context. *Studies in Higher Education, 40*(2), 329–349.

Finch, D. J., Hamilton, L. K., Baldwin, R., & Zehner, M. (2013). An exploratory study of factors affecting undergraduate employability. *Education + Training, 55*(7), 681–704. https://doi.org/10.1108/ET-07-2012-0077

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review, 33*(3), 114–135. https://doi.org/10.2307/41166664

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(2), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hamel, G. (2006). The why, what, and how of management innovation. *Harvard Business Review, 84*(2), 72–84.

Hora, M. T., Benbow, R. J., & Smolarek, B. B. (2018). Re-thinking soft skills and student employability: A new paradigm for undergraduate education. *Change: The Magazine of Higher Learning, 50*(6), 30–37. https://doi.org/10.1080/00091383.2018.1540819

Jackson, D. (2014). Testing a model of undergraduate competence in employability skills and its implications for stakeholders. *Journal of Education and Work, 27*(2), 220–242. https://doi.org/10.1080/13639080.2012.718750

Kuh, G. D., Kinzie, J., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature*. National Postsecondary Education Cooperative.

Lowden, K., Hall, S., Elliot, D., & Lewin, J. (2011). *Employers' perceptions of the employability skills of new graduates*. University of Glasgow.

Mason, G., Williams, G., & Cranmer, S. (2009). Employability skills initiatives in higher education: What effects do they have on graduate labour market outcomes? *Education Economics, 17*(1), 1–30. https://doi.org/10.1080/09645290802028315

Mincer, J. (1974). *Schooling, experience, and earnings*. University of Chicago Press.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Pang, E., Wong, M., Leung, C. H., & Coombes, J. (2022). Competencies for fresh graduates' success at work: Perspectives of employers. *Industry and Higher Education, 36*(1), 18–29.

Peteraf, M. A., & Barney, J. B. (2003). Unraveling the resource-based tangle. *Managerial and Decision Economics, 24*(4), 309–323. https://doi.org/10.1002/mde.1126

Rashid, T., & Asghar, H. M. (2016). Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. *Computers in Human Behavior, 63*, 604–612. https://doi.org/10.1016/j.chb.2016.05.084

Robles, M. M. (2012). Executive perceptions of the top 10 soft skills needed in today's workplace. *Business Communication Quarterly, 75*(4), 453–465. https://doi.org/10.1177/1080569912460400

Römgens, I., Scoupe, R., & Beausaert, S. (2020). Unraveling the concept of employability, bringing together research on employability in higher education and the workplace. *Studies in Higher Education, 45*(12), 2588–2603.

Schultz, T. W. (1961). Investment in human capital. *The American Economic Review, 51*(1), 1–17.

Succi, C., & Canovi, M. (2020). Soft skills to enhance graduate employability: Comparing students and employers' perceptions. *Studies in Higher Education, 45*(9), 1834–1847. https://doi.org/10.1080/03075079.2019.1585420

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319–1350. https://doi.org/10.1002/smj.640

Tomlinson, M. (2017). Forms of graduate capital and their relationship to graduate employability. *Education + Training, 59*(4), 338–352. https://doi.org/10.1108/ET-05-2016-0090

Tymon, A., Eleraky, H., & Harrison, C. (2023). Can we reach a consensus on graduate attributes? *Journal of Higher Education Policy and Management, 45*(1), 96–110.

Wickramasinghe, V., & Perera, L. (2010). Graduates', university lecturers' and employers' perceptions towards employability skills. *Education + Training, 52*(3), 226–244.

Yorke, M. (2006). *Employability in higher education: What it is – what it is not*. Higher Education Academy.

Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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