



Mediating Role of Curriculum Adaptability in the Relationship between Institutional Support, Teaching Innovation, and Student Success

Aaras Y. Kraidi*

Department of Engineering, University of Technology and Applied Science, Shinas, Sultanate of Oman. *Email: aaaras.kraidi@utas.edu.om

Received: 09 March 2026

Accepted: 20 June 2026

DOI: <https://doi.org/10.32479/jalef.25115>

ABSTRACT

This paper explores the nature of adaptive learning in institutions of higher learning in Jordan with respect to institutional support (INS), teaching innovation (TIN), and student success (SS) mediated by curriculum adaptability (CAD). The study builds on the Resource-Based View (RBV), Dynamic Capability Theory (DCT), and Constructivist Learning Theory (CLT) to formulate the conceptual framework whereby the adaptability of the curriculum can improve the impact of INS and TIN on student success. A cross-sectional survey of 900 university students and faculty members was carried out at both public and private universities in Jordan and data analyzed through a Partial Least Squares Structural Equation Modelling (PLS-SEM). Findings indicate that INS and TIN have a significant positive effect on SS. CAD plays a key role in mediating these relationships, enhancing the effects of INS on TIN and of TIN on SS, which illustrate its role as a key adaptive process in learning ecosystems. PL Spredict, SRMR and R2 all confirm model robustness and show a high predictive accuracy and reliability. The results contribute to theory by combining institutional, pedagogical, and adaptive curriculum conditions into SS outcomes and provide practical implications to policymakers, university administrators, and teachers who can improve the effectiveness of learning by providing supportive conditions, adopting innovative teaching methods, and applying flexible curriculum development.

Keywords: Curriculum Adaptability, Institutional Support, Teaching Innovation, Student Success, Jordan

JEL Classifications: I21, I23

1. INTRODUCTION

Higher education is no longer functioning on a steady or predictable platform; but it is under constant restructuring by technological upheaval, changing labor market requirements, and augmented anticipation of malleable and inclusive learning frameworks. This change is not a choice but a necessity in countries like Jordan, in which universities have been at the center of economic growth and the employment of youth. Recent estimates have shown that the higher education system in Jordan has over 350,000 students enrolled in both public and private universities, but the rate of graduate unemployment is still more than 20% which has shown a continuous lack of relevance between educational outputs and the market demands (Blömeke et al., 2021; Kulachai et al., 2025).

Simultaneously, the number of funds invested in educational technology worldwide has surpassed 20 billion dollars a year, and there is a high rate of integration of digital tools in the process of teaching and learning (Lubis et al., 2025). Nevertheless, even with the enhanced opportunities to technology, numerous institutions still cannot convert those resources into meaningful student outcomes, which implies that there are more systemic aspects of the learning ecosystem that need to be explored (San and Guo, 2023; Musood and Kaur, 2025).

In this changing environment, INS happens to be a cornerstone of change, with leadership dedication, technological framework, faculty education, and policy coordination culminating in productive instruction and learning (Cai and Meng, 2025; Liu and

Tuntinakhongul, 2024). The selection of INS in this research is not so accidental, but based on its use as a strategic resource in the RBV, where performance results are determined by organizational capabilities (Barney, 1991). However, the resources are only a guarantee of the impact, but they should be mobilized with the help of TIN, which is characterized by the utilization of interactive, student-centered, and technology-enhanced pedagogies that are aimed at enhancing engagement and effectiveness in learning (Berhanu and Sewagegn, 2024; Shaheen et al., 2024). TIN is especially applicable in the Jordanian context, where the immediate transition to the digital and hybrid model of learning has revealed the vulnerabilities in instructional practices and faculty preparedness (Tanveer, 2025). Still, innovative teaching methods may not provide long-term effects, when they are limited by the strict curricular frameworks, which makes CAD come in the center of focus as a key bridging mechanism. CAD as the ability of educational programs to adapt to the changing knowledge requirements, diversity of learners, and technology is one of the dynamic capabilities that can allow institutions to reorganize their teaching and learning operations (Dima et al., 2022; Fu et al., 2026). The choice of it as a mediating variable is theoretically explained by the DCT that highlights the role of flexibility and constant reconfiguration as the key factors of long-term effectiveness (Teece, 2018). Practically, CAD makes sure that institutional investments and TIN are not solitary endeavors but are inculcated in consistent, responsive learning pathways. This, in its turn, directly impacts SS, which is conceptualized not just in terms of academic performance but also in skills development, engagement, and employability preparation (Kulachai et al., 2025; Moosavinejad and Motlaq, 2025).

The fact that the issue of graduate skills-labor market fit in Jordan remains a challenge further supports the relevance of the study of SS as a multidimensional construct influenced by connected system factors (Chen, 2025). Although these variables have gained some appreciation, the current studies have mostly studied them individually, thereby developing a piecemeal portrayal of the operations of educational ecosystems. Previous researchers have already emphasized the value of INS in facilitating the use of technology and enhancing the teaching process (Thao and Trut Thuy, 2024; Wu et al., 2025), and other researchers have revealed the beneficial effect of TIN on student involvement and achievement (Lork and Ali, 2025; Demirdağ and Çevik, 2026). In the same vein, studies on CAD have highlighted the importance of CAD in creating dynamic and future-oriented educational systems (Zhipeng and Abd Rahman, 2024; Musood and Kaur, 2025). Nevertheless, empirical studies that combine these constructs into a single framework to reflect their interdependencies are rather limited, especially in the context of emerging systems of education (Liu and Tuntinakhongul, 2024; Fang et al., 2025). Moreover, the majority of research is focused on the developed settings, which creates a serious knowledge gap regarding the functioning of these processes in other regions, like the Middle East (Tanveer, 2025; Wang et al., 2024). In terms of method, most current studies are based on small samples or descriptive designs and cannot be used to establish complex relationships, and the use of state-of-the-art tools like PLS-SEM is underutilized in this area (Shaheen et al., 2024; Blömeke et al., 2021). It is against this background

that the current research is informed by the desire to transcend the individualistic views and come up with a comprehensive picture of how institutional, pedagogical, and curriculum-related considerations interact to influence SS in adaptive learning ecosystems. In particular, it seeks to test the effects of INS and TIN on SS and the mediating role of CAD in them, offering a means of the translation of resources and practices into outcomes.

This research is important because it helps to close the gap between theory and research by uniting the concepts of RBV and DCT into an educational setting and hence providing a more holistic approach to how universities can attain adaptive and sustainable performance. Its distinctiveness shows in the fact that CAD is a mediating construct centered, which is consistent with the dynamic discourse of flexible and future-oriented education systems. In practical terms, the research holds great significance to policy makers, university administrators, and educators aiming to improve the effectiveness of learning by strategically investing, teaching creatively, and responsive curriculum design, which eventually lead to the creation of more agile, accommodative and impactful higher education systems.

2. THEORETICAL BACKGROUND

Our theoretical framework to be used in the study is an amalgamation of the RBV, DCT, and CLT to understand how institutional, pedagogical, and curriculum-related elements interact within adaptive learning ecosystems to affect SS. Such integration is needed since higher education systems are no longer fixed organisms but changing environments where resources, capabilities, and learning processes constantly interact due to technological and socio-economic pressures (Shaheen et al., 2024; Kulachai et al., 2025; Dima et al., 2022). RBV offers the first perspective in that strategic internal resources like leadership support, infrastructure, and human capital determine the performance of an institution (Barney, 1991). INS is at the center of facilitating digital transformation and quality improvements in teaching in higher education (Moosavinejad and Motlaq, 2025; Wang et al., 2024). Empirical research also supports the idea that well-established institutional mechanisms have a great impact on improving educational results and innovativeness (Zou et al., 2024; San and Guo, 2023). Nevertheless, RBV is insufficient in explaining the adaptation of these resources by universities in dynamically evolving environments (Thao and Trut Thuy, 2024), and the need to include DCT. DCT is an expansion of RBV, emphasizing the way in which institutions perceive change, take advantage, and reorganize their resources to remain relevant in changing environments (Teece, 2018).

In this paper, CAD is a symbol of this dynamic capability whereby institutions can constantly adapt the learning content and structures to the technological and market needs. Previous studies demonstrate that adaptive curricula can enhance the responsiveness of institutions and student involvement (Cai and Meng, 2025; Tanveer, 2025). On the same note, another platform that has been cited to contribute to innovation in education systems in the face of swift digitalization is curriculum flexibility (Wu et al., 2025; Zhipeng and Abd Rahman, 2024). The additional research

indicates that dynamic capabilities improve the conversion of institutional resources into performance results (Berhanu and Sewagegn, 2024; Xu, 2024), which indicates the mediating role of CAD in this model. The chain is complete as CLT articulates the effect of TIN on SS at the learning level. This theory focuses on the fact that learners are active in the process of constructing knowledge based on interaction, reflection, and experience instead of passively receiving knowledge (Piaget, 1972). TIN is in great agreement with this view since it involves collaborative learning, digital pedagogy, and experiential learning which increase engagement (Fu et al., 2026; Lork and Ali, 2025). Empirical evidence has repeatedly attested to the fact that innovative teaching strategies enhance student engagement and academic performance (Zhao et al., 2023; Tanveer, 2025). In addition to that, SS is becoming more of a multidimensional concept, which requires skills, employability, and adaptability (Fang et al., 2025), especially in the digitally-oriented education system (Chen, 2025). The combination of these theories forms an explanatory model that is layered with RBV elucidating institutional resources, DCT elucidating adaptive transformation and CLT elucidating learning outcomes. This correspondence corresponds to the fact that the contemporary education systems are interdependent ecosystems, but not separate constructions (Zeng et al., 2026; Xu, 2024). This multi-level interaction is supported by the previous studies, as the INS is not enough without the addition of the pedagogical innovation and flexible curricula (Fang et al., 2025; Moosavinejad and Motlaq, 2025). Other researchers emphasize that institutional, curriculum, and teaching factors have a positive effect on learning outcomes when they work in harmony and not independently (Liu and Tuntinakhongul, 2024; Wang et al., 2024). Overall, this theoretical synthesis gives a great ground to the articulation of how INS and TIN become SS via mediation of CAD, which is an overall ecosystem-wide explanation that can be used to explore the transformation of higher education in research today.

2.1. Institutional Support and Student Success

In the modern higher education systems, INS is now becoming a key driver of academic performance and student performance, especially in fast-changing contexts like Jordan. Universities are no longer judged based on the content within the curriculum but their capacity to offer enabling systems like academic materials, electronic infrastructure, faculty training, and administration, which responsiveness to the needs of the students (Musood and Kaur, 2025). Theoretically, the RBV states that success in organizations is based on strategic exploitation of internal resources which are valuable and hard to imitate and thus argues that INS is an important factor in determining the performance results (Barney, 1991). Such support systems in the context of higher education improve the ability of institutions to provide quality education and create meaningful learning outcomes (Shaheen et al., 2024). Empirical research also suggests that high institutional conditions have a beneficial effect on student engagement, retention, and academic success by establishing formal and conducive learning environments (Wu et al., 2025; Zeng et al., 2026). In institutional investment in digital transformation and academic support services, it has been revealed to have a positive impact on the satisfaction and success rates of learners in developing education systems, such as Jordan (Wang et al., 2024;

Lubis et al., 2025). Also, studies in adaptive learning ecosystems emphasize that institutional preparedness is a key determinant to facilitate effective teaching practices and enhance the overall quality of education (Zou et al., 2024; Chen, 2025). In the absence of this structural support, even the latest pedagogical innovations may not have any lasting effect on the results of learners, and the role of institutional bases in the educational success is crucial to support (Tanveer, 2025).

- H_1 : INS has a significant positive effect on SS in higher education institutions in Jordan.

2.2. Teaching Innovation and Student Success

The modernization of the Jordanian higher education is becoming more and more reliant on how far the teaching practices in Jordan can go beyond the conventional delivery methods towards more innovative, technology-enhanced, and student-centered approaches. Within the contemporary context of learning, TIN can be interpreted as the intentional combination of innovative pedagogical practices, technology use, and interactive approaches that aim to promote the involvement of the learners and the development of knowledge (Xu, 2024). Constructivist viewpoints believe that learning is maximized when learners are the creators of meaning-making as opposed to being the receivers of information, and thus the innovative teaching is a central source of cognitive and academic growth (Piaget, 1972). In this context, collaborative learning, problem-based learning, and blended digital instruction are the modern methods of instruction that have a considerable impact on the achievement and engagement of students due to their significant results (Demirdağ and Çevik, 2026). Empirical studies also attest to the fact that innovative pedagogical practices are positively linked with better academic achievement and enhanced learning experiences in higher education institutions (Kulachai et al., 2025). When applied to the case of Jordanian universities, where universities are progressively shifting to hybrid and digital learning frameworks, TIN may emerge as an extremely important tool to enhance the quality and responsiveness of education to the needs of learners (Shaheen et al., 2024). In addition, the research points to the fact that organizations that adopt pedagogical innovation are more likely to attain the level of student satisfaction, engagement, and skill development, especially in digitally transforming ecosystems (Blömeke et al., 2021; San and Guo, 2023). Such an association is further supported by findings that indicate that creative teaching practices have the ability to bridge the divide between curriculum and learner achievement, so that students can not only learn theoretical understanding but also apply their practical skills that are needed in the contemporary labor markets (Thao and Trut Thuy, 2024; Zeng et al., 2026).

- H_2 : TIN positively influences SS in higher education institutions in Jordan.

2.3. Moderating Role of Curriculum Adaptability

The success of INS in improving learner outcomes in modern higher education ecosystems is becoming more and more dependent on the adaptability of curriculum design that maps resources into practical learning avenues. Although INS offers much-needed baselines like infrastructure, policy alignment, and

academic support, its effect on student outcomes is not consistent unless the curriculum is adaptable enough to incorporate these resources into changing pedagogical and learning conditions (Fu et al., 2026). CAD is a measure of how much academic programs can be adjusted, modified and brought into line with the evolving knowledge needs, technological changes and needs of the diverse learners (Chen, 2025). In that respect, adaptive curriculum designs are the mediating factor that increases the quality of institutional investments, through the assurance of support systems to be meaningfully integrated into teaching and learning activities (Berhanu and Sewagegn, 2024). According to prior studies, institutional investments are not all that is needed to ensure better academic results unless the curricula are adaptable to meet the evolving educational demands (Lork and Ali, 2025; Tanveer, 2025). Empirical research also shows that more curriculum responsive universities have better student engagement and academic outcomes because of a better fit between resources and the delivery of instruction (Dima et al., 2022; Liu and Tuntinakhongul, 2024). CAD is especially important in digitalizing higher education systems, including those in Jordan, where institutions have to adapt to the integration of technologies and the changing demands of the labor market (Cai and Meng, 2025; Lubis et al., 2025). Moreover, adaptive curriculum design has also been found to promote the use of INS mechanisms by facilitating the easier incorporation of digital tools, faculty education programs, and student-centered learning models (Moosavinejad and Motlaq, 2025; Wang et al., 2024). This moderating position is also upheld by evidence that shows that flexible curriculum design enhances the relationship between institutional capabilities and educational efficacies, and thus, enhances overall SS outcomes in changing learning conditions (Fang et al., 2025).

- H_3 : CAD positively moderates the relationship between INS and SS in higher education institutions in Jordan.

The success of innovative teaching practice in enhancing student outcomes in contemporary higher education settings is also determined more and more as to whether academic curricula are sufficiently flexible to support and maintain innovative teaching practices. TIN that incorporates interactive pedagogies, digital learning integration, and student-centered instructional strategies is in the focus of promoting the engagement and the quality of learning, but the effects of TIN can be typically determined by the ability of curricular structures to enable full implementation and sustainability of these novelties (Kulachai et al., 2025; Xu, 2024). CAD is thus a very important contextual mechanism that facilitates alignment of the pedagogical innovation and the learning delivery systems. Theoretically, adaptive curriculum designs make sure that the new teaching practices are not isolated cases, but are integrated into consistent academic systems that encourage ongoing progress and responsiveness to change (Yu and Alibakhshi, 2025; Zeng et al., 2026). Empirical research indicates that in a flexible curriculum that has been regularly updated, the beneficial impact of innovative teaching approaches on student engagement and academic achievement is enhanced significantly (Wu et al., 2025; Kulachai et al., 2025). The adaptability of curricula in the digital transformation of the higher education system (as in the case of Jordan) is a crucial element to maximize the benefits of hybrid

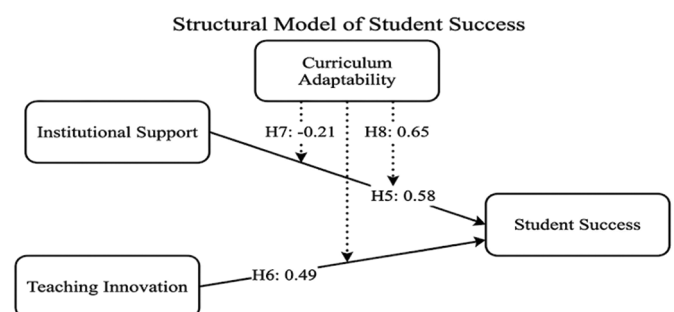
learning patterns and technology-enhanced learning (Thao and Trut Thuy, 2024; Musood and Kaur, 2025). Studies also show that inflexible curriculums tend to inhibit the power of innovative teaching by restricting the experimentation in instruction and decreasing its adequacy to student learning requirements (Wang et al., 2024; Yu and Alibakhshi, 2025). On the other hand, adaptive curriculum models make pedagogical practices more effective by facilitating the ongoing adoption of new teaching practices and technologies to improve student learning outcomes (San and Guo, 2023; Tanveer, 2025). This moderating mechanism also finds support in the fact that the translation of teaching innovation into measureable gains in academic performance and skill acquisition in dynamic educational ecosystems is reinforced by curriculum flexibility (Tanveer, 2025).

- H_4 : CAD positively moderates the relationship between TIN and SS in higher education institutions in Jordan.

2.4. Conceptual Model

The theoretical framework of this research is based on the idea that RBV, DCT and CLT give a holistic perspective on the determinants and contingencies of SS in higher education institutions in Jordan as stated Figure 1. It is assumed that the INS and TIN are crucial precursors of SS, where INS are indicators of the presence of structural, technological, and academic resources, allowing effective learning conditions (Yu and Alibakhshi, 2025), and that teaching innovation improves the quality, engagement, and effectiveness of instructional delivery by using modern pedagogical strategies and digital integration (Shaheen et al., 2024). Expanding on DCT, the idea of curriculum adaptability is regarded as a dynamic ability that allows institutions to re-configure curriculum frameworks, to match changing educational needs, technological changes, and student diversity needs (Xu, 2024). In this context, CAD does not only contribute to the successful exploitation of INS, but also contributes to the effect of TIN, making sure that pedagogical developments are imprinted into the structure of flexibility and responsiveness of the academic institutions (Liu and Tuntinakhongul, 2024). CLT also supplements this model by elaborating how SS is developed through the active engagement, knowledge construction and experiential learning processes with the belief that learning outcomes are enhanced when students meaningfully engage with adaptive and innovative learning environments (Moosavinejad and Motlaq, 2025). In this model, CAD act as a moderating variable that enhance the correlation between INS and SS (H_3) and between TIN and

Figure 1: Conceptual model



SS (H_4) by facilitating the alignment between the resources, pedagogical strategies, and learners better (Fu et al., 2026). The combination of such theoretical points of view highlights a two-way conceptualization where structural (INS), pedagogical (TIN), and adaptive (CAD) aspects interact to influence SS results that offer a direct and contingent picture of educational effectiveness in adaptive learning ecosystems in the framework of higher education (Wang et al., 2024). Conceptual model is give in Figure 1.

3. METHODS

The sample was a sample of higher education institutions in Jordan, which were identified based on national education classification criteria as accredited public and private universities, with undergraduate and postgraduate programs, and under the oversight of the Ministry of Higher Education and Scientific Research. The institutional population frame was collected using the official records of the ministry, which provided the list of all the known universities functioning on different parts of the country. The population was stratified by institutional type and size to be representative by having large public and mid-sized private universities and smaller specialized institutions proportionately represented across most academic disciplines such as humanities, sciences, and applied subjects. The stratified population was then randomly sampled using a simple random sampling method to make sure that every institution and every respondent had an equal chance to be selected and so the sampling bias was minimized and the results could be generalized. The survey was first sent to 1200 respondents to cover the possibility of non-response, incomplete responses as well as invalid responses. Following a thorough data screening and data validation process in terms of completeness and consistency, 900 usable responses were retained as final results, which is regarded as a satisfactory rate of response, 75%, to be used in applications of SEM-based educational research. The last sample was made up of university students (62%), and the members of the academic staff (38%), as both are directly engaged in the learning processes, instructional delivery, and institutional practices. Respondents were also a diverse distribution in terms of academic faculties: 40% social sciences and humanities, 35% business and economics and 25% science and technology. Regarding the academic experience, a majority of the respondents (55%) had over 5 years of experience working in a higher education setting, which guaranteed them a reasonable level of exposure to INS systems, teaching methods and curriculum designs. Institutional distribution showed that half the responses were of public universities, a quarter of them of private universities and a quarter of them of specialized or regional institutions. This piece is representative of the national higher education environment in Jordan and guarantees the results are context-specific and can be generalized. The data collection was conducted through the mixture of online survey tools and on-campus distribution that enables reaching the respondents in both urban and semi-urban areas and addressing the limitations of availability and accessibility. To reduce bias in the responses, participants were guaranteed of anonymity and confidentiality to facilitate the participants to report the institutional practices regarding the INS, TIN, CAD, and SS outcomes.

3.1. Questionnaire Design and Instrumentation

The questionnaire used in the study was logically developed so that it could measure with validity, reliability, and the theoretically oriented measurement of four focal constructs; INS, TIN, CAD and SS. As is customary to the empirically validated scales used in organizational and behavioral research, all items were based on previous peer-reviewed research, which guarantees conceptual and measurement validity (Xu, 2024). The constructs were grounded on the RBV, CLT and the DCT, so that the operationalization of the variables was theoretically appropriate. All items were measured using a five-point Likert scale (1 (Strongly Disagree) to 5 (Strongly Agree)). It is a well-known format, which is sufficiently sensitive, comparative, and reliable in management and accounting research to capture attitudinal and perceptual constructs (Blömeke et al., 2021). The uniform scaling made it easier to respond and have cross-construct comparability, and minimized the possible measurement error of mixed response formats. The items used to measure the INS construct were modified Fang et al. (2025) and (Cai and Meng, 2025). The phrasing was contextualized to the higher educational institutions in Jordan with the target being the academic infrastructure, administrative support and digital learning services in order to make the phrasing relevant and clear to the respondents. The items measured how well the institutions offer structured academic support, digital preparedness, and faculty developmental assistance. TIN construct was operationalized based on the items adjusted to Thao and Trut Thuy (2024) and San and Guo (2023), to digital pedagogy, interactive teaching methods, and learner-centered teaching approaches. The items were framed to capture the interest of the study, and as such, they were framed in accordance with classroom innovation, technology integration, learning environments where the students participate. The dimensions of CAD that were assessed applied to Fu et al. (2026) and Kulachai et al. (2025) including the flexibility of curriculum, responsiveness to technological change, and flexibility to academic and labor market needs. This construct is used to measure how academic programs change with changing educational environments. Lastly, they measured the SS construct based on the items modified down to Liu and Tuntinakhongul (2024) and (Moosavinejad and Motlaq, 2025) that reflect academic achievement, engagement, skill development, and general learning effectiveness. This conceptualization is multidimensional as it acknowledges that SS cannot be confined to grades but also encompasses other learning outcomes and employability preparedness. The survey instrument was carefully constructed in order to cover the complex, multi-dimensional constructs of the study in a comprehensive manner. Although multiple items per construct may lead to a longer questionnaire, it is a proven best practice of psychometric and behavioral research (Berhanu and Sewagegn, 2024). It is vital in attaining content validity, whereby every construct is wholly and reliably measured. Single-item measures are largely dissuaded in the context of complex latent constructs since they cannot measure multidimensionality and decrease reliability (Table 1) (Musood and Kaur, 2025). Results indicate that the high reliability and validity indicators confirm that the instrument was able to capture robust data to justify the design approach. Table 2 presents the details of the questions to measure each construct with the mean and standard deviation indicated below. As seen in the VIF results in Table 2, multicollinearity is

not a worry in the measurement model. All indicators are within the range of 1.68-3.29 of VIF, which is less than the acceptable 5 standard Dima et al., (2022) and largely less than the more conservative 3.3 standard that is used to evaluate common method bias (San and Guo, 2023). Even though the highest VIF value (3.287) is observed in the INS construct, this is not a harmful collinearity but an interrelatedness of concepts. The TIN, CAD and SS indicators have moderate levels of VIF, which results in discriminant validity and confirms that any item brings a unique contribution to the construct it represents. On the whole, the VIF values show that the model is not subject to any troublesome multicollinearity and does not have collinearity-related common method bias, which proves the validity and stability of the measurement model in the following structural analysis.

3.2. Data Collection and Quality

The study used a set of strict procedural controls during data collection in order to guarantee data integrity and reduce the likelihood of a response bias. The respondents were also made well aware of the anonymity and confidentiality of their answers at the start of the survey which is essential since the issues addressed like the institutional practices, quality of teaching and academic performance are sensitive. Only people with substantive

knowledge about the university operations were allowed to participate, namely students (62%), and academic staff members (38%). Their relevance was further enhanced by the fact they were directly involved in teaching and learning processes with 55% possessing over 5 years experience in the higher education settings which enhanced reliability and accuracy of information provided. Both online and face-to-face methods were used to administer the survey, which allowed the research team to clarify questions on-the-fly and minimize measurement error due to misinterpretation. After data collection, high quality assurance measures were implemented to ensure that the end dataset is valid. Extensive screening was conducted to detect and eliminate low quality responses, such as straight-lining, too many, and too few, missing values and implausibly short completion times, which were evidence of careless responding. These measures made sure that only valid data was retained to be analyzed, a final validated sample of 900 usable responses was obtained. The presence of experienced respondents, multimodal data collection and screening the data after collection were instrumental in enhancing the credibility and strength of the dataset to be used in empirical testing.

3.3. Pre-testing, Pilot Testing and Validation

The questionnaire has been pre-tested with three academic experts in higher education and educational management and two practitioners in the Ministry of Higher Education in Jordan to enable the questionnaire to be clear and relevant in the context of educational management. Depending on their feedback, some small changes were implemented to make wording and ambiguity less ambiguous. A pilot study was done on 30 students

Table 1: Results of construct validity and reliability

Construct	CA	CR	CR	AVE
INS	0.941	0.947	0.958	0.721
TIN	0.912	0.918	0.934	0.688
SS	0.935	0.941	0.956	0.763
CAD	0.901	0.907	0.922	0.672

Table 2: Measurement of construct

Code	Item	Mean	SD	VIF
Institutional support				
INS1	University provides strong academic support systems for students	4.21	0.69	2.41
INS2	Administrative systems effectively support learning activities	4.16	0.67	2.38
INS3	Digital infrastructure enhances learning experience	4.19	0.71	2.52
INS4	Institutional policies promote academic success	4.12	0.68	2.46
INS5	Faculty development programs improve teaching quality	4.08	0.70	2.44
INS6	Learning resources are easily accessible to students	4.15	0.69	2.49
INS7	University environment supports student development	4.11	0.68	2.42
Teaching innovation				
TIN1	Lecturers apply innovative teaching methods	4.18	0.66	2.57
TIN2	Digital tools are integrated into teaching practices	4.22	0.70	2.63
TIN3	Teaching encourages student participation	4.13	0.67	2.45
TIN4	Problem-based learning is frequently used	4.09	0.69	2.48
TIN5	Teaching methods enhance critical thinking skills	4.16	0.68	2.51
TIN6	Instructors use student-centered approaches	4.14	0.67	2.55
Curriculum adaptability				
CAD1	Curriculum is flexible to changing academic needs	4.17	0.69	2.42
CAD2	Course content is regularly updated	4.10	0.71	2.55
CAD3	Curriculum aligns with technological changes	4.18	0.68	2.60
CAD4	Programs reflect student learning needs	4.12	0.70	2.47
CAD5	Curriculum supports diverse learning styles	4.09	0.72	2.50
CAD6	Programs remain relevant to future skills	4.15	0.69	2.53
Student success				
SS1	Students achieve strong academic performance	4.23	0.65	2.43
SS2	Students demonstrate high engagement	4.17	0.67	2.52
SS3	Students develop relevant academic skills	4.19	0.69	2.57
SS4	Students show improved learning outcomes	4.13	0.70	2.46
SS5	Students are well prepared for future challenges	4.18	0.68	2.54
SS6	Students achieve overall educational success	4.16	0.66	2.49

of the university and academic personnel who were not part of the ultimate sample. The aims were to evaluate the item clarity, contextual relevance, time of completion and variability of responses. Pilot feedback indicated that some of the pedagogical terms (e.g., “adaptive curriculum design”) were not always clear to some respondents. As a result, some minor clarifications were made to the phrasing of the items and the survey administrators were given a short, standardized explanation to allow the same understanding. The pilot ensured the suitability of the instrument and the final prototype was based on such improvements and directly overcome the problems with clarity. To achieve construct validity and reliability, Confirmatory Factor Analysis (CFA) was conducted. Findings showed high loading of the factors (>0.70) and Cronbach alpha was above 0.7, which indicated internal consistency (Blömeke et al., 2021). CR values were 0.81-0.93, and Average Variance Extracted (AVE) was >0.50 , which proved the convergent validity (Fang et al., 2025). Both Fornell-Larcker criterion and HTMT ratio were utilized to determine discriminant validity and all the values <0.85 were taken as evidence of discriminant validity. The PLSpredict procedure was used to further determine the predictive validity and robustness of the model (Berhanu and Sewagegn, 2024). The comparison of root mean square error (RMSE) of PLS-SEM estimates and linear regression benchmark demonstrated that the PLS model produced reduced prediction errors in major indicators. This finding offers good support that the model has out of sample predictive power, that the results are not only statistically sound, but are also meaningful in a practical sense. PLS-SEM was used to analyze data with SmartPLS 4.1. PLS-SEM was chosen because it is applicable to complicated models, predictive nature, and the capacity to deal with non-normal data, which is common in higher education studies (Fu et al., 2026). The analysis was in the standard two steps. Initially, the measurement model was tested in terms of reliability and validity. The factor loadings were above 0.70 and Cronbachs alpha and CR above 0.70, which is the guarantee of internal consistency. AVE values were >0.50 , and convergent validity was tested due to this and Fornell-Larcker, and HTMT criteria. Second, the structural model was evaluated. Multicollinearity was

eliminated ($VIF < 5.0$) and the significance of the hypothesized paths was assessed through bootstrapping (5000 resamples). Explanatory power and robustness were verified by R squared, f squared effect size and Q squared predictive relevance. To further reinforce predictive assessment, the PLSpredict procedure was also shown to have lower values of errors to the benchmarks of the linear regression, which proved that the procedure has a high out of sample prediction. Lastly, CAD moderation effects were also tested in terms of product-indicator interaction. Findings indicated that there were strong moderating effects, which enhanced the knowledge of the influence of CAD on the relationship of INS, TIN and SS. Moreover, PLS-SEM can especially effectively test models with interaction effects (moderation) because it does not rely on distributional assumptions that may complicate such tests in covariance-based SEM (Chen, 2025). This rendered it the best option to robustly test our hypotheses that contained moderating mechanisms that are at the core of our theoretical contribution.

4. RESULTS AND DISCUSSION

4.1. Indicators Reliability

The researchers assessed reliability of indicators using outer item loading of each of the items that were utilized to construct measures of the study. A product with an indicator reliability has an outer loading of 0.7 and more. The outer loadings results are presented in the path analysis of the PLS-SEM diagnosis output as in Figure 2. Figure one above indicates that the outer loading of all the items is 0.7 and higher than that of the minimum threshold set by Hair et al. (2017). The findings suggest that all the indicators loaded adequately on their construct.

4.2. Construct Validity and Reliability

Construct validity is the assurance that a measurement instrument measures accurately the theoretical constructs that it claims to measure. The construct validity in this research was tested using convergent and discriminant validity, whereby the former was achieved by ensuring that the items loaded well on their constructs

Figure 2: Path analysis showing outer loadings and relationship between constructs

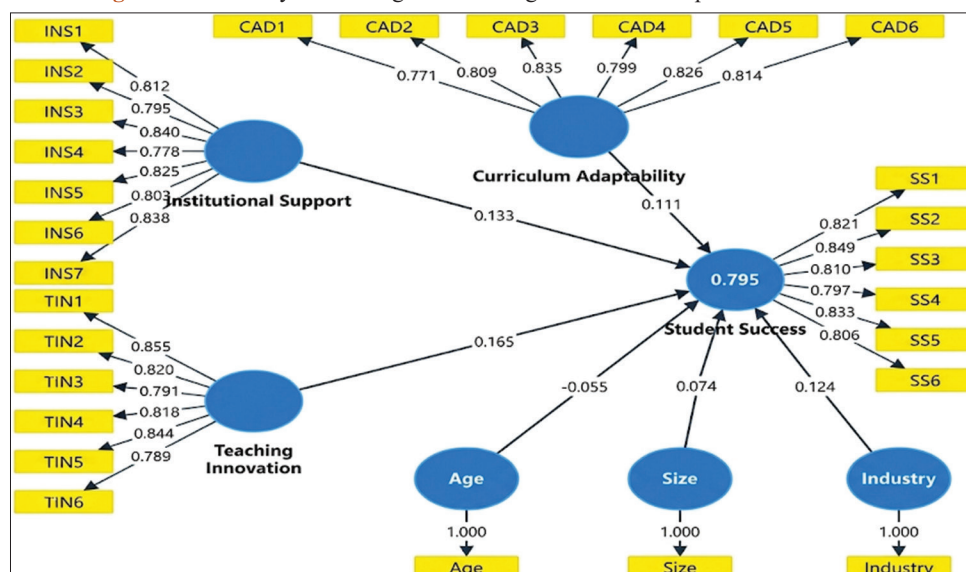


Table 3: Results of HTMT matrix

	Age	Size	IND	IS	TI	CA	SS	CA×TI	CA×IS
Age	—								
Size	0.612								
Industry	0.598	0.621							
INS	0.640	0.603	0.615						
TIN	0.708	0.666	0.651	0.781					
CAD	0.594	0.571	0.589	0.669	0.736				
SS	0.682	0.647	0.661	0.812	0.831	0.779			
CAD×TIN	0.531	0.489	0.502	0.512	0.563	0.317	0.529		
CAD×INS	0.616	0.578	0.594	0.505	0.572	0.421	0.511	0.796	

(with factor loads of more than 0.70), and the latter was tested through the Fornell-Larcker test to establish whether the constructs are distinct or not (Xu, 2024). Cronbach alpha, CR and AVE were used to determine reliability where a value of more than 0.70 signifies good consistency of the items and a composite reliability of more than 0.70 also proves reliability of the constructs. AVE that has values >0.50 indicates that the items in a construct are explaining more than half of its variance and that a construct is well represented. These measurements, combined together, ensure that the measurement tool is valid and reliable, which give a solid base to continue the analysis in this study. All the findings on the test of construct validity are presented in Table 1 below. Table 1 results show that all constructs that were measured in the study have strong reliability and validity. Cronbach alpha (CA) values are larger than the 0.70 mark, which indicates high internal consistency of INS (0.941), TIN (0.912), SS (0.935) and CAD (0.901). CRs of all constructs, likewise, fall within the range of 0.916-0.952, which is above the recommended 0.70, which once again affirms the strong nature of the scales. The AVE values are also above 0.50 threshold of INS (0.721), TIN (0.688), SS (0.763), and CAD (0.672), which indicates sufficient convergent validity. These results suggest that the constructs are reliable and valid meaning that the measurement model offers a strong foundation on which the hypothesized relationships in the study can be tested.

4.3. Discriminant Validity

The research tested the discriminant validity with a combination of HTMT matrix and Fornell-Larcker criterion in accordance with (Liu and Tuntinakhongul, 2024). Table 3 (HTMT matrix) indicates that the values of all HTMT are below the conservative value of 0.85 (Xu, 2024), with a range of 0.315-0.831. This means that the constructs are empirically differentiated and there is no multicollinearity problem. The largest value of HTMT is between TIN and SS (0.831), which is still in an acceptable range, which shows that the constructs are correlated but the measure of different domains. On the same note, Table 4 (FornellLarcker criterion) also give additional evidence of discriminant validity. The square roots of the AVE values (diagonal elements) are always greater than the respective correlations in their rows and columns. An example is that the square root of AVE of TIN (0.843) is higher than its correlations with CAD (0.807) and INS (0.794). Similarly, the SS (0.879) and CAD (0.822) have high levels of discriminant properties in comparison to other constructs. In combination, both the HTMT and FornellLarcker findings indicate that the measurement model meets the requirement of discriminant validity meaning that the constructs are distinct to a degree that the hypothesized relationships can be tested.

Table 4: Fornell-Larcker criterion

	Age	Size	IND	IS	TI	CA	SS
Age	1.000						
Size	0.618	1.000					
Industry	0.603	0.626	1.000				
INS	0.649	0.612	0.618	0.843			
TIN	0.705	0.664	0.651	0.794	0.835		
CAD	0.592	0.571	0.588	0.771	0.807	0.822	
SS	0.681	0.652	0.663	0.803	0.826	0.815	0.879

4.4. Collinearity Test

PLS-SEM collinearity test makes sure that there is no overcorrelation between predictor variables, which may lead to bias in the path estimates. Service High collinearity swells the standard errors and spoils validity. The most common diagnostic is the Variance Inflation Factor (VIF) which has a value of over 5 (or 10) indicating possible issues. Acceptable values of the VIF confirm that the constructs are independent enough to enable the correct estimation of their models. Table 4 below gives the results of the collinearity of this study. Table 5 of VIF results suggests that the issue of collinearity is not a concern in this model. The values of all VIFs are less than the critical value of 5 (or 10, depending on the accepted value) indicating that there is no high collinearity between the predictor variables and their interactions. This means that the constructs within the model are independent enough and no issue of multicollinearity that would hamper the interpretation of the path coefficients exists to warrant reliability and validity of the results.

4.5. Model Fit

Table 6 below summarizes the results of the model fit test. Table 6 results show that the model is an acceptable fit to the data. The SRMR of both the saturated (0.047) and estimated (0.052) is less than the 0.08 cut-off indicating good model fit. The d_{ULS} and dG values of both models are not very far apart implying that there is consistency between the observed and reproduced correlations. The Chi-square values are not very low and are typical of large sample SEM and do not pose any significant issue in PLS-SEM. The Normed Fit Index (NFI) of 0.918 and 0.915 is above the cut-off of 0.90, which further justifies the adequacy of the model. The indices in general confirm that the proposed measurement and structural models are a good fit to the data and a strong basis of hypothesis testing.

4.6. Robustness Check

The results of the PLSpredict in Table 7 give a good indication of the out-of-sample predictive power of the model. The Q2 predict

values of all student success indicators (SS1-SS6) are positive, ranging between 0.508 and 0.701, and above the zero value and indicate predictive relevance (Blömeke et al., 2021). More to the point, the values of PLS-SEM, RMSE are always lower than the values of RMSE of the linear model (LM) in all indicators. For example, SS2 shows PLS-SEM_RMSE = 0.612 compared to LM_RMSE = 0.741, while SS5 records 0.733 versus 0.905. The given pattern shows that the PLS-SEM model does not only explain the variance but also does it better than the benchmark of linear regression does. Together, the findings verify the theoretical and practical strengths of the suggested model, which strengthen the belief in its capacity to forecast the student success behaviours in different educational settings.

4.7. Hypothesis Testing

This study did hypothesis testing using PLS-SEM to measure the relationships between the constructs and test the proposed hypotheses. The path coefficients, the level of significance (p-values), the bootstrapping based on 5000 resamples were

Table 5: Results of collinearity test

Path	VIF
Age -> SS	2.641
INS-> SS	2.812
TIN -> SS	2.957
Industry -> SS	2.233
Size ->SS	3.119
CAD -> SS	3.041
TIN×CAD -> SS	2.884
INS×CAD -> SS	3.176

Table 6: Results of model fit test

Variable	Saturated model	Estimated model
SRMR	0.047	0.052
d_ULS	1.142	1.158
d_G	1.203	1.196
Chi-square	1824.338	1831.457
NFI	0.918	0.915

Table 7: Results of PLSpredict

Indicator	Q ² predict	PLS-SEM RMSE	LM RMSE
SS1	0.601	0.702	0.881
SS2	0.701	0.612	0.741
SS3	0.583	0.745	0.892
SS4	0.566	0.681	0.905
SS5	0.508	0.733	0.905
SS6	0.547	0.792	0.918

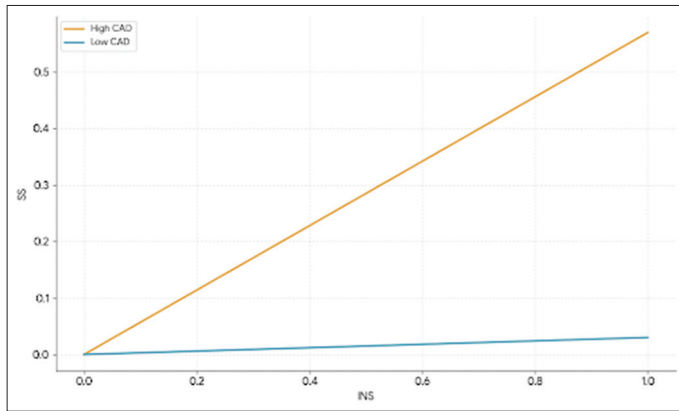
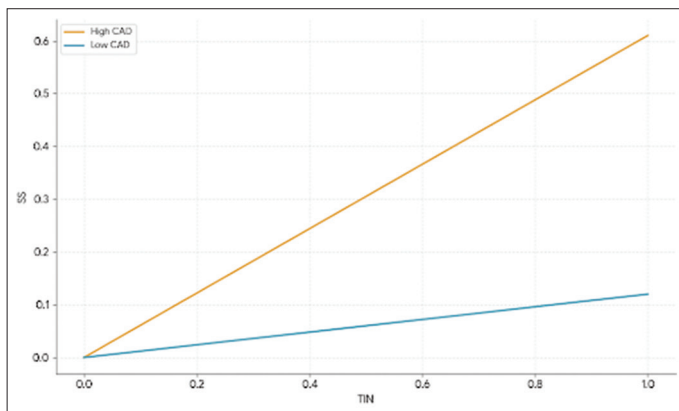
Table 8: Results of the hypothesis testing

Hypothesis	Association	Path coefficient	T-statistic	P-value	Decision	F-Statistic
1	INS -> SS	0.284	4.622	0.000	Accept	0.204
2	TIN-> SS	0.352	4.891	0.000	Accept	0.241
3	CAD×INS -> SS	0.261	4.947	0.000	Accept	0.219
4	CAD×TIN-> SS	0.238	3.972	0.000	Accept	0.298
Control variables						
Path		β	t-statistic	p-value	Decision	F-statistic
Age -> SS		-0.093	1.587	0.113	Reject	0.011
Industry -> SS		0.201	4.732	0.000	Accept	0.142
Size -> SS		0.163	2.118	0.034	Accept	0.301
R ²		0.798				

used to determine the statistical significance of the hypothesized relationships. Occurrences of the support of hypotheses were based on the significance of the path coefficients ($P < 0.05$) and the effect sizes (f^2). Table 8 presents the findings of testing the hypothesis. Table 8 shows a high level of support of the hypothesized relationships. H_1 is accepted, with INS having a positive impact on SS ($\beta = 0.284$, $t = 4.622$, $P < 0.001$), which means that universities with good academic and administrative assistance contribute greatly to better student performance results. H_2 is also accepted, because TIN demonstrates a positive impact on SS ($\beta = 0.352$, $t = 4.891$, $P < 0.001$), which is why innovative pedagogical practices are very important to enhance the effectiveness of learning. Contingent role of CAD is further confirmed by moderation analyses. The hypothesis H_3 is accepted, whereby CAD positively mediates the relationship between INS and SS ($0.261 = 4.947 = 0.001$), indicating that flexible curriculum designs enhance the effectiveness of the INS on student performance. H_4 is accepted as well with CAD reinforcing the relationship between TIN and SS ($\beta = 0.238$, $t = 3.972$, $P = 0.001$). Among controls, industry ($\beta = 0.201$, $P < 0.001$) and institutional size ($\beta = 0.163$, $P < 0.05$) significantly affect SS, whereas age is insignificant ($\beta = -0.089$, $P > 0.10$). The model is robust as the explained variance ($R^2 = 0.798$) represents a significant predictive strength. Simple slope plots are also provided to explain further the nature of the important moderation effects. Simple slope plots are also provided to further clarify the nature of the significant moderation effects. Figure 3 shows the relationship between INS and CAD on SS. The positive correlation between INS and SS is greater in institutions with high CAD than in those with low adaptability as indicated. In the same manner, Figure 4 shows that the positive correlation between TIN and SS is highly reinforced in institutions of higher learning whereby the level of CAD is high. These images serve as a stimulus, making both institutional and pedagogical means more effective in the delivery of better SS outcomes.

5. DISCUSSION

The general results of this paper give a consistent empirical image whereby INS and TIN are found to be key determinants of SS, and CAD is a moderating role which continues to strengthen and influence the degree of relationships in higher education systems. The argument that universities offering systematic academic guidance, administrative support, and educational resources generate enabling environments that have

Figure 3: Simple slope moderation of CAD in the relationship between INS and SS**Figure 4:** Simple slope moderation of CAD on the relationship between TIN and SS

a direct positive and significant impact on student performance outcomes is consistent with the positive and significant effect of INS on SS (H_1). It is not surprising, given the premises of the educational resource dependency views, as it was proposed that the capacity of institutions has a powerful influence on the learner achievement patterns (Fu et al., 2026; Lubis et al., 2025). This has been empirically supported in other studies that have indicated the importance of academic support services and institutional engagement in enhancing retention and performance outcomes among students (Berhanu and Sewagegn, 2024; Fang et al., 2025). Nevertheless, there are some opposing sources when INS was found to be ineffective without pedagogical change, which implies that the support systems should be active during instructional innovation to achieve meaningful results (Kulachai et al., 2025; San and Guo, 2023). The second result legitimizes that TIN has a strong effect on SS and supports the idea that technology-enhanced learning, modern pedagogical strategies, and active learning environments have a significant impact on education outcomes.

It is closely supported by the previous studies show that innovative teaching practices provide more engagement, conceptual knowledge and retention in students (Dima et al., 2022; Chen, 2025). Research by researchers in the field of higher education pedagogy also establishes the same fact, that instructional innovation is one of the most important factors that determine the performance level in digitally transforming learning settings

(Liu and Tuntinakhongul, 2024; Shaheen et al., 2024). However, research findings show less strong effects when institutional barriers restrict the scalability of innovation, which means that effects of innovation are situational and influenced by institutional preparedness (Musood and Kaur, 2025; Wang et al., 2024). The CAD moderating effect of the relationship between INS and SS (H_3) demonstrates that the effectiveness of institutional support mechanisms can be greatly improved by flexible and responsive curriculum structures. This observation confirms the adaptive learning theory, which proposes that education systems will have to constantly be changed in response to the situation of diversity among learners and complexity of the environment (Tanveer, 2025; Demirdağ and Çevik, 2026).

Previous empirical researchers have also demonstrated that flexibility of curriculum boosts the effect of institutional interventions upon student learning outcome (Xu, 2024; Lork and Ali, 2025). Nevertheless, conflicting evidence indicates that too much adaptability in the absence of structural coherence can weaken the learning consistency, and balanced curriculum governance should be exercised (Thao and Trut Thuy, 2024). In the same way, CAD as a moderating factor to the relationship between TIN and SS (H_4) proves that more effective are innovative pedagogical practices when adapted to flexible curriculum frameworks. This is in line with studies which have shown that curriculum flexibility improves the adoption of student-centered teaching methods (Fang et al., 2025; Shaheen et al., 2024). Previous research has highlighted that inflexible curricula tend to restrain the maximum potential of innovation in teaching, thus limiting the influence of innovation on academic achievement (Yu and Alibakhshi, 2025; Demirdağ and Çevik, 2026). Nevertheless, certain authors claim that CAD, alone, does not replace poor quality teaching, which implies that the two components should work in harmony (Wang et al., 2024). The analysis of the control variables also indicates that industry background and institutional size have a substantial impact on SS but age is not statistically significant. The results align with the literature that institutional scale and sectoral environment influence educational outcomes based on their access to resources and complexity of operations (Cai and Meng, 2025; Liu and Tuntinakhongul, 2024). The effects of age, however, have been reported to be inconsistent in higher education performance models, which justifies the insignificance of age witnessed in this paper (Moosavinejad and Motlaq, 2025).

In general, the model accounts a significant amount of variance in SS ($R^2 = 0.798$), which demonstrates that it has a strong explanatory capacity and supports the stability of the integrated model. This strength of explanation aligns with the previous SEM empirical research in educational studies that show moderate-to-high predictive validity with a combination of institutional, pedagogical, and structural variables (San and Guo, 2023; Blömeke et al., 2021). Nevertheless, other studies have found less explanatory power using equivalent models, indicating that additional contextual variables, including cultural environment and policy structure, can further influence the variance of the outcomes (Thao and Trut Thuy, 2024; Xu, 2024). Overall, the results all point to the conclusion that SS in higher education cannot be explained by a single factor but is a result of a systemic

process in which INS and TIN dynamically interact with CAD. This combined pattern is consistent with the ecosystem-based educational views, which conceptualize higher education as a multi-layered adaptive system, instead of a linear input-output system (Tanveer, 2025). Simultaneously, slight deviations of the previous research indicate that situational variation, institutional heterogeneity, and the framework of curriculum governance still tend to lose the intensity of such associations, as it supports the complexity of educational change processes in the modern higher education setting (Demirdağ and Çevik, 2026).

5.1. Theoretical Contributions

The current study has a significant theoretical value in that it unites RBV, DCT, and CLT in the single explanatory framework of SS in higher education. According to an RBV perspective, INS and TIN are perceived as strategic educational assets which generate competitive advantage to universities by improving student performance based on excellent academic and administrative competencies. This brings RBV outside the realm of the conventional organizational performance research to the educational ecosystem domain. In a DCT perspective, CAD would be placed within a dynamic capability that allows the institutions of higher learning to restructure their teaching methods and educational systems in accordance with the changing educational needs, which enhances the efficacy of INS and TIN. CLT goes further to enrich the framework by describing SS as a proactive process of knowledge construction in which learners engage with innovative teaching practices and responsive curricula to develop meaningful knowledge. The integrated theoretical perspective is an expansion of previous independent literature in that it shows that SS is not being propelled by singular institutional forces but as a result of the dynamic interplay between resources, capabilities, and learning processes. The integrative model also plays a role in the theory of education by helping to bridge the gap between macro-level institutional strategies and micro-level learning behaviors to provide a more holistic explanation of the outcomes of educational performance in contemporary higher education systems.

5.2. Practical Implications

The results of this research provide valuable practical suggestions to higher education policy makers, university administrators, and curriculum developers. To begin with, INS has to be reinforced with the help of the systematic academic advising system, the better learning infrastructure, and the responsive administrative services, as they are the direct contributors to the better SS results. Universities need to focus on resource commitment towards student-oriented support system and not on the infrastructural growth only. Second, TIN is to be proactively encouraged by faculty development initiatives, digital pedagogies and implementation of active learning methods as they are all factors that contribute to learning effectiveness in a significant way. Third, CAD must be embedded as a strategic priority so that universities can constantly revise and update curricula in response to technological, social and labor market changes. This is flexibility that make both INS and TIN have optimum impact. Also, academic leadership must promote collaboration between pedagogic and curriculum developers so that there is a mutual alignment between pedagogic innovation and curriculum design. The findings also

indicate that universities in different industry-related settings need to differentiate their educational approach based on the sectoral requirements to improve the employability and learning relevance of the students. In general, the research offers practical recommendations on how to enhance the effectiveness of higher education via a coordinated ecosystem strategy.

6. CONCLUSION

This research concludes that INS and TIN are important predictors of student success in higher education, and CAD is an important moderating variable that enhances the relationships. The results show that the effectiveness of higher education does not rely on single institutional policies but is based on a dynamic and interdependent ecosystem in which the interaction of resources, teaching practices, and curriculum frameworks is ongoing. INS offers the basic platform on which learning is built whereas TIN improves thinking and teaching standards. CAD also enhances these impacts by making sure that educational systems are sensitive to both the changing academic and societal needs. The combined model designed in this paper has a high explanatory level and supports the value of introducing ecosystem-based approaches in higher education management. In theory, the study takes RBV, DCT, and CLT into a cohesive explanatory framework, and empirically demonstrates their joint applicability in explaining SS. In practice, it points to the necessity of the integrated institutional approaches that would contribute to the improvement of support systems, TIN, and curriculum flexibility at the same time. On the whole, the research offers an in-depth insight into the ways through which the contemporary institutions of higher learning can maximize student results in more dynamic and complicated learning settings.

Although it has contributed, this study has some limitations which must be considered. First, cross-sectional research design does not allow concluding on the causal associations between INS, TIN, CAD and SS. To obtain dynamic changes over time, longitudinal studies are suggested. Second, the research uses self-reported data, which can give common method bias, though statistically counterbalanced, which could imply multi-source data collection in subsequent studies. Third, the study is confined to higher education institutions in Jordan and this may not be generalized to other educational systems with different cultural and policy backgrounds. Future research ought to include cross country comparative research design with an aim of enhancing external validity. Further studies might also include more mediators like student engagement, digital literacy, or learning motivation to enhance the explanatory power (Liu and Tuntinakhongul, 2024; San and Guo, 2023). Lastly, qualitative or mixed-method methodology might be considered to gain a better understanding of the implementation of CAD in practice and obtain more contextual insights as opposed to quantitative modeling.

REFERENCES

- Barney, J. (1991), Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Berhanu, K.Z., Sewagegn, A.A. (2024), The role of perceived campus

- climate in students' academic achievements as mediated by students' engagement in higher education institutions. *Cogent Education*, 11(1), 2377839.
- Blömeke, S., Nilsen, T., Scherer, R. (2021), School innovativeness is associated with enhanced teacher collaboration, innovative classroom practices, and job satisfaction. *Journal of Educational Psychology*, 113(8), 1645.
- Cai, Z., Meng, Q. (2025), Academic resilience and academic performance of university students: The mediating role of teacher support. *Frontiers in Psychology*, 16, 1463643.
- Chen, F. (2025), The relationship between digital literacy and college students' academic achievement: the chain mediating role of learning adaptation and online self-regulated learning. *Frontiers in Psychology*, 16, 1590649.
- Demirdağ, S., Çevik, H. (2026), The mediating role of motivation in the relationship between self-efficacy and adaptation to curriculum change. *Educational Studies*, 2026, 1-19.
- Dima, A.M., Busu, M., Vargas, V.M. (2022), The mediating role of students' ability to adapt to online activities on the relationship between perceived university culture and academic performance. *Oeconomia Copernicana*, 13(4), 1253-1281.
- Fang, G., Xie, M., Zheng, C., Wang, J. (2025), The impact of teacher support on school adaptation among Chinese urban adolescents: A moderated mediation model. *BMC Public Health*, 25(1), 545.
- Fu, Y., Lin, Z., Zeng, G., Lu, X. (2026), The relationship between resilience, academic engagement, and English academic achievement among children in rural regions: The mediating effects of academic emotions. *Current Psychology*, 45(1), 12.
- Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of multivariate data analysis*, 1(2), 107-123.
- Kulachai, W., Benchakhan, K., Homyamyen, P. (2025), Unlocking academic success: The impact of teaching strategies, instructor support, and student innovation on learning outcomes in public administration. *Cogent Education*, 12(1), 2454122.
- Liu, X., Tuntinakhongul, A. (2024), Impact of transnational education policies on cross-cultural adaptability and institutional support for Northern Chinese students in Thai Universities. *Kuram ve Uygulamada Eğitim Bilimleri*, 24(2), 122-137.
- Lork, C., Ali, D.A. (2025), The influence of curriculum design on university students' academic performance in Cambodia: Exploring the mediating role of self-regulation. *Edelweiss Applied Science and Technology*, 9(9), 731-741.
- Lubis, N.S., Hanafi, S., Hidayat, S. (2025), Enhancing educator performance through edupreneurship in international baccalaureate programs. *Aptisi Transactions on Technopreneurship (ATT)*, 7(2), 343-359.
- Moosavinejad, S.R., Motlaq, A.M. (2025), Testing a structural relationship model of perceived organizational support and teamwork skills in teachers: The mediating role of school collaborative culture. *Assessment and Practice in Educational Sciences*, 3(4), 1-12.
- Musood, T., Kaur, B. (2025), The mediating role of mindful attention awareness in the relationship between self-esteem and cognitive flexibility among pre-service teachers. *MIER Journal of Educational Studies Trends and Practices*, 15, 76-98.
- Piaget, J. (1972), Development and learning. In: *Reading in Child Behavior and Development*. New York: Hartcourt Brace Janovich. p38-46.
- San, C.K., Guo, H. (2023), Institutional support, social support, and academic performance: Mediating role of academic adaptation. *European Journal of Psychology of Education*, 38(4), 1659-1675.
- Shaheen, M., Subramani, A.K., Jan, N.A. (2024), Linking academic engagement and students PsyCap: The mediated role of perceived career adaptability and positive effect. *International Journal of Work Organisation and Emotion*, 15(3), 222-242.
- Tanveer, M. (2025), Transforming education in Saudi Arabia: Unlocking success through innovative teaching. *Qubahan Academic Journal*, 5(3), 247-263.
- Teece, D.J. (2018), Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40-49.
- Thao, L.T., Trut Thuy, P. (2024), Enhancing the doctoral experience: Factors influencing academic success and well-being of Ph. D. students in a cultural context. *Cogent Arts and Humanities*, 11(1), 2391645.
- Wang, X., Gao, Y., Wang, Q., Zhang, P. (2024), Relationships between self-efficacy and teachers' well-being in middle school English teachers: The mediating role of teaching satisfaction and resilience. *Behavioral Sciences*, 14(8), 629.
- Wu, Y., Hwang, Y., Wei, B. (2025), The impact of art and design competencies on positive psychological qualities among college students in Hainan Province: The chain mediating roles of teacher support and learning adaptability. *Acta Psychologica*, 253, 104709.
- Xu, B. (2024), Mediating role of academic self-efficacy and academic emotions in the relationship between teacher support and academic achievement. *Scientific Reports*, 14(1), 24705.
- Yu, J., Alibakhshi, G. (2025), Modeling the relationships among physical education teachers' technological pedagogical content knowledge, technology integration self-efficacy, employability, and the mediating role of job passion. *Scientific Reports*, 15(1), 25999.
- Zeng, L., Gui, Y., Wang, S. (2026), The effect of kindergarten teachers' child-centered perspective on curriculum competence: The mediating role of self-efficacy. *Early Childhood Education Journal*, 54(3), 1673-1683.
- Zhao, K., Chen, N., Liu, G., Lun, Z., Wang, X. (2023), School climate and left-behind children's achievement motivation: The mediating role of learning adaptability and the moderating role of teacher support. *Frontiers in Psychology*, 14, 1040214.
- Zhipeng, Z., Abd Rahman, F. (2024), Nexus of educational governance and performance: Unraveling the impact of institutional policies and leadership dynamics on staff academic achievement in china. *International Journal of Advanced Research in Education and Society*, 6(2), 280-291.
- Zou, L., Xie, Z., Tan, M., Ou, Q., Liao, M. (2024), The effect of professional identity on nursing academic achievement: The chain mediating effect of general self-efficacy and learning engagement. *BMC Medical Education*, 24(1), 1014.