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ARTICLE

Sustainable Competitive Intelligence for Institutional Resilience: Crisis Response and Sustainable Development in Private Universities

Inteligência Competitiva Sustentável para a Resiliência Institucional: Resposta a Crises e Desenvolvimento Sustentável em Universidades Privadas

Yutong Yang
Dhurakij Pundit University, Bangkok, Thailand.

Peng-Fei Chen
Dhurakij Pundit University, Bangkok, Thailand.

Kexiu Fang
Dhurakij Pundit University, Bangkok, Thailand.

ABSTRACT | Purpose: This study examines how private universities convert environmental intelligence into institutional sustainable development (ISD), testing whether organizational resilience mediates the relationship between crisis response and ISD. Drawing on competitive intelligence and complemented by dynamic capabilities theory, it treats crisis response and resilience as the utilization and feedback stages of an institution-level intelligence capability that supports a sustainable competitive position. **Methodology/approach:** Guided by a competitive-intelligence and dynamic-capabilities framework, a cross-sectional survey was administered to faculty members and administrators of private universities in Yunnan, China, yielding 742 valid responses. Constructs were validated through confirmatory factor analysis; the mediation model was tested with hierarchical regression and bias-corrected bootstrapping (5,000 resamples), controlling for gender, age, and leadership level. **Originality/Relevance:** The study reframes crisis response and organizational resilience as components of an institution-level competitive-intelligence capability, which is the utilization and feedback stages of the intelligence cycle that underpins a university's sustainable competitive advantage, and provides rare evidence from resource-constrained, non-elite private higher education. **Key findings:** Crisis response positively predicted organizational resilience (β = .33) and ISD (total effect β = .49), and resilience positively predicted ISD (β = .32). Resilience partially mediated the crisis response–ISD relationship (indirect effect = .11; 95% CI [.076, .136]), accounting for roughly 22% of the total effect. All four hypotheses were supported. **Theoretical/methodological contributions:** This study extends dynamic capabilities theory to the institutional level in higher education and links it to the competitive-intelligence literature, positioning crisis response and resilience as the utilization and feedback stages of an institutional intelligence system.

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Corresponding Author: Oksana Desyatnyuk – E-mail: o.desyatnyuk@ujis.in.ua

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Methodologically, it empirically establishes resilience as the mechanism linking crisis response to sustainability and validates a multidimensional instrument for reuse.

Keywords | Competitive intelligence. Sustainable competitive intelligence. Crisis response. Organizational resilience. Institutional sustainable development. Dynamic capabilities. Sustainable competitive advantage.

RESUMO | Objetivo: Este estudo examina como as universidades privadas convertem a inteligência do ambiente em desenvolvimento sustentável institucional (DSI), testando se a resiliência organizacional medeia a relação entre a resposta a crises e o DSI. Fundamentado na inteligência competitiva e complementado pela teoria das capacidades dinâmicas, trata a resposta a crises e a resiliência como as etapas de utilização e de retroalimentação de uma capacidade de inteligência de nível institucional que sustenta uma posição competitiva sustentável. **Metodologia/abordagem:** Orientado por uma estrutura de inteligência competitiva e capacidades dinâmicas, aplicou-se um levantamento transversal a docentes e gestores de universidades privadas em Yunnan, China, obtendo-se 742 respostas válidas. Os construtos foram validados por análise fatorial confirmatória; o modelo de mediação foi testado com regressão hierárquica e bootstrapping corrigido pelo viés (5.000 reamostragens), controlando-se gênero, idade e nível de liderança. **Originalidade/Relevância:** O estudo reformula a resposta a crises e a resiliência organizacional como componentes de uma capacidade de inteligência competitiva de nível institucional—as etapas de utilização e de retroalimentação do ciclo de inteligência—que sustentam a vantagem competitiva sustentável de uma universidade, e fornece evidências raras do ensino superior privado não elitizado e com recursos limitados. **Principais resultados:** A resposta a crises predisse positivamente a resiliência organizacional (β = 0,33) e o DSI (efeito total β = 0,49), e a resiliência predisse positivamente o DSI (β = 0,32). A resiliência mediou parcialmente a relação entre resposta a crises e DSI (efeito indireto = 0,11; IC 95% [0,076, 0,136]), respondendo por cerca de 22% do efeito total. As quatro hipóteses foram confirmadas. **Contribuições teóricas/metodológicas:** Este estudo estende a teoria das capacidades dinâmicas ao nível institucional no ensino superior e a conecta à literatura de inteligência competitiva, posicionando a resposta a crises e a resiliência como as etapas de utilização e de retroalimentação de um sistema de inteligência institucional. Metodologicamente, estabelece empiricamente a resiliência como o mecanismo que liga a resposta a crises à sustentabilidade e valida um instrumento multidimensional para reutilização.

Palavras-chave | Inteligência Competitiva. Inteligência Competitiva Sustentável. Resposta a crises. Resiliência organizacional. Desenvolvimento institucional sustentável. Capacidades dinâmicas. Vantagem competitiva sustentável.

1. INTRODUCTION

Higher education institutions worldwide operate in an increasingly uncertain and turbulent external environment characterized by economic shocks and abrupt policy shifts. If managed ineffectively, such crises can trigger reputational damage that disrupts enrollment and operations within a single academic cycle (Pearson & Clair, 1998; Bundy, Pfarrer, Short, & Coombs, 2017). An institution's crisis response is therefore critical not only for weathering immediate shocks but also for building long-term organizational resilience. From a strategic management perspective, an institution's capacity to anticipate, interpret, and absorb such shocks rests on its competitive intelligence (CI)—the systematic and ethical process of scanning the external environment, identifying risks and opportunities early, analyzing them, and disseminating and utilizing the resulting intelligence to inform strategic action (Aguilar, 1967; Calof & Wright, 2008; Pellissier & Nenzhelele, 2013). Understood this way, crisis response is the point at which environmental intelligence is mobilized into coordinated institutional action, and organizational resilience is the capacity through which that action is consolidated, through learning and feedback, into durable advantage.

Private universities are especially vulnerable to such crises because they depend heavily on tuition revenue and enjoy weaker policy protection than their public counterparts (L. Liu, 2023; Welch, 2024). Specifically, in China, private higher education has expanded rapidly to absorb mass demand. However, institutions in less-developed western provinces such as Yunnan face thinner resource bases and greater environmental volatility (Han, Ni, & Gao, 2023; Welch, 2024). For these universities, converting crisis response into long-term institutional sustainable development (ISD), defined as the balanced pursuit of educational, organizational, and financial viability, has become an existential imperative.

Despite this urgency, the process through which crisis response translates into long-term sustainability remains under-specified in higher education. Crisis-management research offers rich accounts of how organizations detect, interpret, and respond to disruption, but it is drawn largely from firms and general organizations and less often examines crisis response as an institution-level governance capability in universities (Bundy et al., 2017; Pearson & Clair, 1998). Research on organizational resilience in higher education has grown quickly, especially since the COVID-19 pandemic. However, it is still dominated by descriptive or single-case studies of how institutions cope. Also, it seldom tests how resilience is built from an institution's handling of crises or how it links that handling to enduring outcomes (Hillmann & Guenther, 2021; Shaya, Abukhait, Madani, & Khattak, 2023). Organizational resilience is therefore often invoked as a desirable property but rarely modeled as an explicit intervening mechanism.

A parallel gap concerns the outcome. Scholarship on sustainability in higher education has concentrated on campus operations including curriculum and sustainability assessment. It less often treats institutional sustainable development as an organizational outcome bound up with governance capacity and resilience (Trevisan, Leal Filho, & Pedrozo, 2024). As a result, crisis response, organizational resilience, and institutional sustainable development have rarely been integrated into a single analytical model. Empirically, they are almost never examined in resource-constrained, non-elite private universities, where structural pressures are most acute and institutional survival is least assured (Duan, Yang, & Ning, 2023). Addressing this gap requires not only relating the three constructs but specifying the mechanism that connects them.

To integrate these constructs, this study adopts competitive intelligence (CI) as its primary conceptual lens and draws on dynamic capabilities theory to explicate its underlying organizational processes. CI refers to the systematic and ethical process through which organizations identify intelligence needs, collect and analyze information about their external environment, and disseminate and apply that intelligence to support strategic decision-making and sustain competitive advantage (Calof & Wright, 2008; Pellissier & Nenzhelele, 2013; Prescott, 1999). Dynamic capabilities theory complements this perspective by specifying the micro-foundations through which intelligence is converted into organizational action. In particular, its sensing, seizing, and transforming routines closely parallel the scanning, utilization, and adaptation stages of the CI cycle (Teece, 2007).

Building on these complementary perspectives, this study conceptualizes crisis response as the utilization of environmental intelligence that is, the coordinated translation of sensing and analysis into organizational action whereas organizational resilience represents the feedback and learning process through which those actions are evaluated, refined, and transformed into enduring

institutional capability (Gilad, 2004; Herring, 1999). Together, the two perspectives portray crisis response and resilience not as independent capabilities, but as successive stages in an institution-level intelligence capability that enables organizations to adapt to environmental disruption while sustaining long-term competitiveness. In doing so, the study contributes to a growing body of research applying competitive intelligence and strategic management perspectives to higher education (Chen & Park, 2026; H. Liu, 2026; Tang et al., 2026).

Resource-constrained private universities provide a particularly conservative setting in which to examine this intelligence-based capability. These institutions face pronounced environmental uncertainty while operating with limited financial slack and comparatively weak external support, making the conversion of disruption into sustained organizational development especially challenging (Duan et al., 2023). If the proposed mechanism operates under such constrained conditions, it is likely to generalize to better-resourced universities confronting similar environmental pressures. The empirical setting used to test the model is described in Section 3.

Accordingly, this study addresses two research questions in private higher education: (1) Do crisis response and organizational resilience significantly relate to institutional sustainable development? (2) Does organizational resilience mediate the relationship between crisis response and ISD? These questions are examined using survey data from 742 faculty members and administrators at private universities in Yunnan, China, with which the study validates multidimensional measures and estimates the mediation model using bias-corrected bootstrapping, controlling for respondent demographics.

The study makes three contributions. Conceptually, the study also contributes to the competitive-intelligence literature by extending it from the firm to the level of university governance, positioning crisis response and resilience as the utilization and feedback stages through which strategic intelligence is converted into sustainable competitive advantage (Calof & Wright, 2008; Prescott, 1999); What's more, this extends dynamic capabilities theory from the firm to the institutional level of higher education. Rather than assuming that competent crisis handling simply yields sustainability, the study specifies and tests organizational resilience as the intervening mechanism, and integrate the crisis-management and resilience research streams (Williams et al., 2017). Empirically, it provides evidence from an under-researched population, non-elite private universities in a less-developed western province of China, and validate a multidimensional instrument that can be reused in comparable higher-education systems. Practically, this study reframes crisis-response and resilience capabilities as sources of sustainable competitive advantage (Tang et al., 2026), giving administrators of tuition-dependent institutions evidence-based priorities for capability building.

2. THEORETICAL FRAMEWORK

This section develops the study's theoretical framework. It first establishes competitive intelligence as the primary conceptual foundation, reviewing its classical literature and its intelligence cycle, and then draws on dynamic capabilities theory to specify the micro-foundations that link intelligence to action. Against this integrated backdrop, it defines the three focal constructs crisis response, organizational resilience, and institutional sustainable development critically synthesizing prior research on each, and finally derives the four hypotheses tested in the empirical analysis.

2.1 Competitive Intelligence

Competitive intelligence (CI) is the systematic and ethical process of gathering, analyzing, and disseminating information about the external environment competitors, markets, regulation, and stakeholders so that it can be acted upon to secure and sustain competitive advantage (Calof & Wright, 2008; Pellissier & Nenzhelele, 2013). Its intellectual roots lie in two older traditions: environmental scanning, which Aguilar (1967) defined as the acquisition of information about events and trends in an organization's environment to help executives identify threats and opportunities, and Porter's (1980) framework for structured competitor and industry analysis. Prescott (1999) traces how CI subsequently evolved from ad hoc data gathering toward analysis, then toward a strategic input to decision-making, and finally toward an embedded organizational capability. Definitions nonetheless remain contested: early treatments emphasized information collection about competitors (Fuld, 1995), whereas later, process-oriented conceptions stress analysis, decision relevance, and organizational learning (Fleisher & Bensoussan, 2007). Reviewing this fragmentation, Pellissier and Nenzhelele (2013) note the absence of a universally accepted definition and converge on CI as a needs-driven, ethical process that supports timely managerial decisions. We hereby adopted this conception.

Most accounts organize CI as a cyclical process, commonly rendered as planning and direction, collection, analysis, dissemination, utilization, and feedback (Dishman & Calof, 2008). Planning specifies what intelligence decision-makers actually need; through his key intelligence topics (KITs) approach, Herring (1999) argues that CI programs fail most often not because analysis is weak but because they answer questions no decision-maker ever asked, and that early-warning topics belong at the center of this stage. Collection and analysis then convert scattered signals into interpreted insight; here the literature is notably self-critical, with Fleisher and Bensoussan (2007) arguing that analysis, rather than data access, is the field's persistent weak point, and Dishman and Calof (2008) confirming empirically that organizations tend to be strong at collection but weak at analysis and process. Dissemination and utilization concern whether intelligence reaches decisions and is acted upon. It is a recurrent failure point because much collected intelligence is never used (Gilad, 2004), while feedback loops the results of action back into the next planning cycle. Comparative work further shows that firms occupy a continuum from tactical, ad hoc CI to strategically embedded intelligence, and that only the latter reliably shapes strategy (Wright, Pickton, & Callow, 2002). The recurring lesson across these treatments is that CI confers advantage only when the full cycle, and not collection alone, is enacted.

Applied to institutional governance, CI reframes crisis management as the product of structured intelligence work rather than improvised reaction: environmental scanning supports early risk identification, analysis and dissemination shape a coordinated response, and utilization and feedback build the capacity to withstand future shocks. Gilad's (2004) competitive early-warning logic makes this link explicit, positioning intelligence as the mechanism that keeps organizations from being blindsided by strategic discontinuities, which are precisely the challenge facing tuition-dependent universities exposed to demographic, policy, and reputational risk. A growing stream now applies CI to higher education specifically, using student and institutional analytics for decision support (Chen & Park, 2026), leveraging emerging analytical tools (Hair & Sabol, 2024), and connecting intelligence to educational innovation and sustainable competitive advantage (H. Liu, 2026; Tang et al., 2026). Two

limitations nonetheless persist in the classical literature. First, it is overwhelmingly firm-centered and prescriptive, developed for corporate competitors rather than mission-driven institutions such as universities. Second, it rarely connects the intelligence cycle to downstream organizational outcomes such as resilience and sustainability, treating utilization as an endpoint rather than a driver of adaptive capacity. This study addresses both gaps by treating crisis response as the institutional enactment, or utilization, of environmental intelligence and organizational resilience as the feedback-and-learning capacity through which that intelligence is converted into institutional sustainable development.

2.2 Dynamic Capabilities Theory

The study draws insights from dynamic capabilities theory, which addresses a question at the center of strategic management: how organizations sustain advantage when their environments change faster than their existing resource endowments (Teece et al., 1997). The theory builds on, and departs from, the resource-based view. The resource-based view holds that resources which are valuable, rare, inimitable, and organizationally embedded are the foundation of sustained competitive advantage (Barney, 1991; Wernerfelt, 1984). Yet a purely resource-based account explains the possession of advantage better than its renewal; it says little about how organizations adapt when the value of existing resources is eroded by external change. Dynamic capabilities theory was advanced to close this gap. Teece et al. (1997, p. 516) defined dynamic capabilities as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments, shifting attention from what an organization owns to how it renews what it owns.

Teece (2007) later specified the microfoundations of this capacity as three interrelated clusters of activity. Sensing is the capacity to scan the environment and to identify opportunities and threats before they fully materialize; seizing is the capacity to commit resources and make timely decisions once change has been recognized; and transforming, or reconfiguring, is the capacity to renew structures, routines, and resource configurations so that the organization remains aligned with its environment over the longer term (Teece, 2007, 2014). Complementary work characterizes dynamic capabilities as identifiable strategic and organizational processes whose form varies with environmental velocity (Eisenhardt & Martin, 2000), and locates them within a capability lifecycle through which capabilities emerge, mature, and are renewed over time (Helfat & Peteraf, 2003). Across these treatments, dynamic capabilities are higher-order routines that operate on an organization's ordinary capabilities, and their exercise depends heavily on managerial judgment and organizational learning (Augier & Teece, 2009; Wilden, Gudergan, Nielsen, & Lings, 2013). These accounts also differ in emphasis: where Teece (2007) specifies elaborate, hierarchical micro-foundations, Eisenhardt and Martin (2000) contend that in high-velocity environments dynamic capabilities reduce to simple, experiential routines a divergence that leaves the construct open to the recurring criticism of conceptual ambiguity and potential tautology (Wilden et al., 2013). Reading these micro-foundations alongside the competitive-intelligence cycle helps discipline the concept: sensing corresponds to environmental scanning and collection, seizing to the utilization of analyzed intelligence, and

transforming to the feedback-driven reconfiguration through which capability is renewed (Aguilar, 1967; Teece, 2007).

Although dynamic capabilities theory originated in the analysis of firms, its logic also applies to public and nonprofit organizations, whose survival likewise depends on adapting to shifting mandates and resource conditions (Piening, 2013). Universities are a pertinent case. They are knowledge-intensive institutions that must continually realign programs, governance arrangements, and resource flows in response to policy reform, demographic change, and competitive pressure. Recent work has applied a dynamic-capabilities lens directly to how universities adapt and pursue their missions under uncertainty (Guerrero & Menter, 2024). Extending the theory to the institutional level of higher education therefore treats sensing, seizing, and transforming as institution-level capabilities embedded in a university's routines for monitoring, deciding, and renewing.

The constructs examined here map onto the theory's core logic. Crisis response corresponds to the sensing and seizing of disruptive change detecting threats and mobilizing a coordinated institutional reaction. Organizational resilience corresponds to the transforming capacity that allows an institution to absorb shocks, adjust, and renew its capabilities after disruption. Institutional sustainable development represents the longer-term performance outcome that these capabilities are expected to support. Dynamic capabilities theory thus provides an integrating account in which crisis response and resilience are the microfoundational routines through which universities protect and extend a sustainable competitive position (Barney, 1991; Teece, 2007).

2.3 Crisis Response

Crisis response refers to the actions an organization takes to detect, contain, and recover from events that threaten its core goals, stakeholders, and legitimacy (Coombs, 2007; Pearson & Clair, 1998). Early treatments emphasized acute, low-probability, high-impact events, but contemporary crisis-management scholarship frames crises more broadly, as disruptions that may be sudden or slow-burning and that unfold across a lifecycle of preparation, acute response, and post-crisis learning (Bundy et al., 2017). Effective response is correspondingly understood not as reactive communication alone but as an ongoing capability spanning sensemaking, coordinated decision-making, stakeholder communication, and organizational learning under pressure (Boin, 't Hart, Stern, & Sundelius, 2016).

In higher education this broader view is especially apt. The disruptions that private universities face are often chronic rather than episodic sustained policy reform, demographic decline, enrollment volatility, financial fragility, and reputational risk so that crisis response operates less as emergency management than as a continuing governance capability (Bundy et al., 2017; Welch, 2024). For resource-constrained private institutions in particular, the capacity to interpret risk early and to respond in a coordinated way is closely tied to the protection of core educational and organizational functions, because limited external support leaves fewer buffers against missteps (Hu et al., 2025).

Consistent with instruments developed for educational settings (Da'as, Qadach, & Schechter, 2025), the present study operationalizes crisis response through four dimensions: student support and protection, promotion of internal and external learning processes, enabling systems management, and collaboration with external organizations and peers. These dimensions correspond closely to the

sensing and seizing microfoundations of dynamic capabilities: monitoring and interpreting threats to students and operations, mobilizing internal decision-making and learning, granting the autonomy needed to act, and coordinating with external partners to secure resources and legitimacy. Crisis response, in this sense, is the institutional routine through which a university converts awareness of disruption into coordinated action. Viewed through a competitive-intelligence lens, these dimensions constitute the utilization stage of the intelligence cycle. Crisis-management scholarship and CI early-warning research converge in treating anticipation and sensemaking as central (Bundy et al., 2017; Gilad, 2004; Herring, 1999), but they differ in emphasis the former foregrounds response and stakeholder communication, the latter the structured collection and analysis that precede action—and the two literatures have rarely been integrated. Framing crisis response as intelligence-in-use links early risk identification to the coordinated action on which resilience depends.

2.4 Organizational Resilience

Organizational resilience is the capacity of an organization to anticipate and prepare for adversity, to absorb and respond to it, and to adapt and renew itself afterwards (Duchek, 2020; Lengnick-Hall, Beck, & Lengnick-Hall, 2011). Reviews of the construct distinguish resilience as an outcome bouncing back to a prior state from resilience as a capability or process the capacity to adjust and improve through adversity and increasingly favor the latter, capability-based conception (Bhamra, Dani, & Burnard, 2011; Hillmann & Guenther, 2021). Understood as a process, resilience is closely aligned with the transforming dimension of dynamic capabilities: it is not merely the ability to withstand a shock but the ability to reconfigure resources and routines so that the organization emerges better adapted (Ortiz-de-Mandojana & Bansal, 2016; Williams et al., 2017).

Resilience is also multidimensional rather than a single trait. This study draws on a conceptualization comprising capital, strategic, cultural, relational, and learning resilience (Chen, Xie, & Liu, 2021). Capital resilience refers to the financial and material slack that allows an institution to absorb loss; strategic resilience to the ability to preserve mission while adjusting direction; cultural resilience to the shared values and support that sustain members under strain; relational resilience to the strength of internal and external stakeholder ties; and learning resilience to the capacity to draw lessons from disruption. Together these dimensions show that resilience rests on connected resources, relationships, and routines rather than on any single organizational factor (Hillmann & Guenther, 2021).

In higher education, resilience has attracted growing attention, particularly following the disruption of the COVID-19 pandemic, which tested universities' capacity to maintain academic continuity and student experience under sustained strain (Shafi, Middleton, Millican, & Templeton, 2024; Shaya et al., 2023). Yet less is known about how resilience is built specifically, how an institution's handling of crises contributes to it and how, in turn, resilience shapes longer-term institutional outcomes in resource-constrained private universities. Positioning resilience as a dynamic capability that both buffers shocks and enables renewal (Prayag, Jiang, Chowdhury, Hossain, & Akter, 2024) motivates its treatment here as the mechanism that links crisis response to sustainable development. Two limitations recur in this literature. Conceptually, resilience is defined inconsistently—as trait,

outcome, and process—which weakens cumulative theory-building (Hillmann & Guenther, 2021); empirically, it is frequently invoked as a desirable property yet seldom linked to a specific antecedent capability. Positioning resilience as the feedback-and-learning stage of an intelligence-driven process addresses the second gap by specifying crisis response as the antecedent through which resilience is built.

2.5 Institutional Sustainable Development

Institutional sustainable development (ISD) denotes a university's ability to sustain and balance its educational, organizational, financial, and social performance over time. Its conceptual roots lie in the triple-bottom-line logic of sustainability, which holds that organizational development should be judged not by economic performance alone but jointly by economic, social, and environmental outcomes (Elkington, 1997). Corporate-sustainability scholarship extends this logic by arguing that long-term viability requires an organization to maintain economic, social, and environmental capital simultaneously, rather than trading one against another (Dyllick & Hockerts, 2002). Sustainable development, on this view, is a multidimensional organizational outcome encompassing governance, stakeholder responsibility, operational continuity, and continuous improvement, not environmental stewardship alone.

Applied to higher education, sustainable development takes on additional breadth because universities are simultaneously operational organizations and educational and social institutions. They contribute to sustainability through teaching, research, governance, campus operations, and community engagement, so that institutional sustainability is best pursued through a whole-institution approach rather than isolated initiatives (Findler, Schönherr, Lozano, Reider, & Martinuzzi, 2019; Lozano, Lukman, Lozano, Huisingh, & Lambrechts, 2013). Consistent with this literature, the present study adopts a validated, multidimensional operationalization of institutional sustainable development spanning environmental stewardship, social responsibility, economic viability, stakeholder engagement, governance and ethics, integration and alignment, and continuous improvement (Na-Nan, Phanniphong, Niangchaem, & Ouppara, 2024).

Framing ISD in competitive terms links it directly to the study's theoretical lens. For tuition-dependent private universities competing for students, funding, and legitimacy, sustained development reflects the capacity to maintain a defensible institutional position amid changing student demand, funding conditions, and policy (Barney, 1991; Welch, 2024). Understood this way, institutional sustainable development is the enduring performance outcome that dynamic capabilities are expected to produce. Framing sustainable development as the output of an intelligence-driven capability connects it explicitly to the competitive-intelligence tradition, in which the ultimate purpose of the intelligence cycle is a defensible, sustainable competitive position (Prescott, 1999; Tang et al., 2026). For universities, institutional sustainable development is thus the enduring advantage that effective environmental scanning, crisis response, and resilience are expected to secure.

2.6 Hypotheses

Framed as a competitive-intelligence capability, the hypotheses below trace how a university converts environmental intelligence into enduring advantage: crisis response utilizes that intelligence in coordinated action, organizational resilience consolidates it through feedback and learning, and institutional sustainable development is the resulting sustainable competitive position.

Dynamic capabilities theory suggests that the way an organization responds to disruption shapes the adaptive capacity it carries forward. When a university faces crisis conditions, it must interpret threats, make timely decisions, coordinate internal units, and communicate with stakeholders (Bundy et al., 2017). Repeatedly enacting these routines does more than resolve the immediate problem: it accumulates the sensing, coordinating, and learning capacities that constitute resilience (Duchek, 2020; Williams et al., 2017). In other words, crisis response is the practical activity through which resilience is exercised and, over time, strengthened. During the process, crisis experience is converted into more stable routines and improved coordination (Zollo & Winter, 2002). This mechanism is likely to be pronounced in resource-constrained private universities, where limited external support means that internal response capacity is a primary source of the slack, relationships, and learning on which resilience depends (Hu et al., 2025). Thus, the hypothesis one is proposed below.

H1: Crisis response has a significant positive effect on organizational resilience.

Crisis response is also expected to bear directly on institutional sustainable development, and not only through resilience. Timely, well-coordinated response limits the extent to which a disruption becomes lasting organizational damage and reallocates resources toward viable activities (Bundy et al., 2017; Coombs, 2007). From a sustainability standpoint, long-term institutional viability depends on continuity, adaptation, and the maintenance of responsible stakeholder relationships (Dyllick & Hockerts, 2002), each of which is served when an institution manages disruption effectively rather than allowing it to erode core functions. For private universities operating under tight financial and policy constraints, competent crisis handling helps preserve the educational, financial, and social performance on which continued development rests (Welch, 2024). This suggests a direct association between crisis response and institutional sustainable development that is additional to any indirect path through resilience. Hence, the hypothesis two is proposed below.

H2: Crisis response has a significant positive effect on institutional sustainable development.

Organizational resilience, in turn, is theorized to support sustainable development. Resilient institutions do not merely return to their prior state after disruption; they convert adversity into renewal, using accumulated resources, relationships, and learning to sustain performance across educational, organizational, and financial domains (Ortiz-de-Mandojana & Bansal, 2016; Williams et al., 2017). Longitudinal evidence from other sectors indicates that organizations with stronger resilience, built through sustainable practices, achieve greater long-term viability and

less performance volatility (Ortiz-de-Mandojana & Bansal, 2016). Mapped onto the transforming microfoundation of dynamic capabilities, resilience is the capacity through which reconfiguration becomes durable institutional development rather than temporary recovery (Teece, 2007). In higher education, the dimensions of resilience examined here capital, strategic, cultural, relational, and learning correspond to the governance capacity, stakeholder engagement, economic viability, and continuous learning that define institutional sustainable development (Chen et al., 2021; Na-Nan et al., 2024). Accordingly, the hypothesis three is proposed below.

H3: Organizational resilience has a significant positive effect on institutional sustainable development.

The arguments imply a sequential, mediated logic that is central to the dynamic-capabilities account: crisis response builds resilience, and resilience in turn supports sustainable development. Resilience is therefore expected to transmit part of the association between crisis response and institutional sustainable development. Although crisis response mitigates immediate disruption, its contribution to long-term institutional development is realized only as institutions become more resilient by retaining experience, rebuilding coordination, and improving future practice (Duchek, 2020; Zollo & Winter, 2002). Recent empirical work likewise finds that organizational resilience mediates the relationship between organizational capabilities and sustainable-development outcomes (Prayag et al., 2024). A partial rather than full mediation is anticipated, given the direct path argued under H2. Hence, the hypothesis four is proposed below.

H4: Organizational resilience mediates the relationship between crisis response and institutional sustainable development.

Figure 1 depicts the hypothesized research model and the four hypothesized paths.

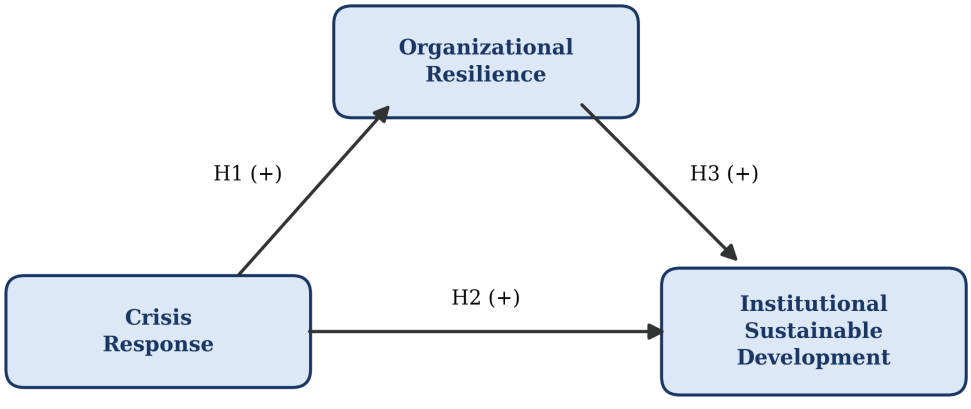

Figure 1. Hypothesized research model

Source: Prepared by the authors (2026)

3 METHOD

A quantitative, cross-sectional survey design was used to test the hypothesized model. The study context is private (non-public) universities in Yunnan, a less-developed western province of China, where institutions operate under tight resource constraints and heightened environmental volatility (Han et al., 2023; Welch, 2024).

3.1 Data Collection

Data were collected through a self-administered online questionnaire. Web-based administration was appropriate because the private universities in the sampling frame are geographically dispersed across Yunnan, and online surveys allow efficient access to respondents distributed across sites (Evans & Mathur, 2005). The instrument was delivered in Chinese, the working language of the participating institutions, and comprised two parts: three background items (gender, age, leadership level) followed by 69 Likert-scale items measuring the three focal constructs, for a total of 72 questions.

Instrument development proceeded in two stages before the main survey. First, the adapted questionnaire was submitted to a panel of five experts in education management, higher-education governance, private-university management, and scale development, each holding the rank of lecturer or above with at least ten years of relevant experience. Experts rated every item on a three-point suitability scale, from which item-level (I-CVI) and scale-level (S-CVI) content validity indices were computed. Content validity was strong: S-CVI values were .981 for crisis response, .989 for organizational resilience, and .965 for institutional sustainable development, giving an overall S-CVI of .975 comfortably above the .900 threshold for good content validity (Lynn, 1986). Items falling below the I-CVI criterion were revised in line with expert comments.

Second, a pilot study was conducted. Of 200 pilot questionnaires distributed, 150 valid responses were returned (75.0% effective response rate), satisfying the minimum sample size for exploratory factor analysis (Gorsuch, 1983). The pilot data were subjected to item analysis (critical ratio and corrected item-total correlation, with a retention criterion of CITC > .400), exploratory factor analysis (KMO, Bartlett's test of sphericity, eigenvalues, and factor loadings), and reliability analysis. Items with weak statistical performance were deleted or reworded, yielding the final instrument used in the main survey.

The formal survey was then administered to eligible respondents across the sampled institutions. A total of 850 questionnaires were distributed and 742 valid responses were retained, an effective response rate of 87.3%; the remaining 108 were excluded prior to analysis for incompleteness or unacceptable response patterns. Table 1 reports the profile of the final sample.

Participation was voluntary throughout. Before completing the survey, respondents received an explanation of the study's purpose and procedures and were informed of their right to withdraw at any time without penalty; informed consent was obtained prior to completion. No personally identifiable information names, specific job titles, or identifiable institutional affiliations — was collected; responses were coded numerically and stored in password-protected files; and all findings are reported in

aggregate, so that neither individual respondents nor their institutions can be identified. The study received ethical clearance from the research ethics committee of the authors' host institution, in accordance with internationally recognized standards for research involving human participants.

3.2 Sample

The target population comprised faculty members and administrators of private universities in Yunnan, China. These respondents were selected because their roles give them direct visibility into institutional operation, resource coordination, crisis handling, and development planning — the phenomena the study seeks to capture. Because the constructs require informed judgments about institution-level processes, a stratified purposive sampling strategy was adopted rather than simple random sampling: purposive selection targets respondents with the relevant knowledge and experience (Campbell et al., 2020; Etikan, Musa, & Alkassim, 2016), while stratification ensures that distinct subgroups are represented (Patton, 2015).

As Table 1 shows, 54.7% of respondents were male; 50.7% were aged 41–50; and respondents were distributed across three leadership levels, with 53.5% not holding a formal leadership position. Participation was voluntary and responses were anonymous. Before completing the survey, respondents were informed of its purpose and of their right to withdraw at any time without penalty, and they provided informed consent; no personally identifiable information was collected, and the study received ethical approval from the host institution's research ethics committee in accordance with recognized standards for research involving human participants.

Table 1. Sample profile (N = 742)

Characteristic	Category	Frequency	%
Gender	Male	406	54.7
	Female	336	45.3
Age	40 and below	177	23.9
	41–50	376	50.7
	51 and above	189	25.5
Leadership level	School-level leader	174	23.5
	Head of second-level unit	171	23.0
	Non-leader faculty/staff	397	53.5

Note. Percentages are valid percentages.
Source: Prepared by the authors (2026)

3.3 Measures

All constructs were measured with multi-item scales rated on a five-point Likert scale. Crisis response (19 items) comprised four dimensions: student support and protection, promotion of internal and external learning processes, enabling systems management, and collaboration with external organizations and peers. Organizational resilience (17 items) comprised capital, strategic, cultural,

and learning resilience. Institutional sustainable development (33 items) comprised environmental stewardship, social responsibility, economic viability, stakeholder engagement, governance and ethics, integration and alignment, and continuous improvement and learning. Items were adapted from established scales and refined through expert content-validity review (item-level CVI) and a pilot study; full item wording and the scale-development evidence are provided in the online Supplement. Gender, age, and leadership level were included as control variables.

3.4 Reliability and Validity

Internal consistency was high for all scales (Cronbach's alpha = .84 for crisis response, .92 for organizational resilience, and .94 for ISD; all dimensions exceeded .80), comfortably above the conventional .70 criterion (Nunnally, 1978). Confirmatory factor analysis (CFA) supported convergent validity: standardized loadings ranged from .65 to .98, composite reliability (CR) exceeded .70, and average variance extracted (AVE) exceeded .50 for every dimension, meeting conventional thresholds (Bagozzi & Yi, 1988; Fornell & Larcker, 1981; Hair, Black, Babin, & Anderson, 2019). The measurement models fit the data well. Discriminant validity was supported because the square root of each construct's AVE exceeded its correlations with the other constructs (Table 2).

3.5 Common Method Bias

Because the data are self-reported and single-source, Harman's single-factor test was conducted. The first unrotated factor accounted for 27.29% of the variance, well below the 50% threshold, suggesting that common method bias is unlikely to account for the results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The limits of this test are revisited in Section 3.7.

3.6 Data Analysis

Hypotheses were tested in SPSS using hierarchical regression and mediation analysis. Following Preacher and Hayes (2008) and Hayes (2018), the indirect effect of crisis response on ISD through organizational resilience was estimated with bias-corrected bootstrapping (5,000 resamples), with mediation inferred when the 95% confidence interval excluded zero. Gender, age, and leadership level were entered as covariates in all models.

3.7 Methodological Considerations and Limitations

Several features of the research design bound the inferences that can be drawn and are stated here so that the results are read in their proper light. First, the design is cross-sectional: because all constructs were measured at a single point in time, the analysis identifies associations consistent with the hypothesized ordering but cannot establish the temporal precedence that a mediation model logically requires, so the findings are associational rather than causal (Maxwell & Cole, 2007).

Second, the data are single-source and self-reported by faculty members and administrators, which raises the possibility of common method variance; Harman's single-factor test was reassuring, but it is only a weak diagnostic (Podsakoff et al., 2003). Third, all constructs rely exclusively on perceptual measures of respondents' judgments, without corroborating objective indicators. Fourth, and relatedly, the study lacks external organizational validation: it does not triangulate self-reports against institutional records such as enrollment, retention, financial, or accreditation data. Fifth, it employs a single quantitative method and so offers no methodological triangulation with which to cross-check the survey evidence. Sixth, it includes no qualitative component no interviews with university managers and no documentary analysis of governance or crisis-response processes that could illuminate the mechanisms behind the observed associations.

Several steps were taken to mitigate these constraints expert content-validity review, a pilot study, confirmatory factor analysis, and bias-corrected bootstrappingand the measurement models performed well; these procedures strengthen confidence in the reliability and validity of the constructs but do not remove the inferential limits above. The design was adopted for feasibility, given a geographically dispersed population of private universities and the absence of a centralized institutional-performance database for the sector. The limitations it entails directly motivate the future-research agenda set out in Section 5.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics and Correlations

On the five-point scale, all three constructs were rated above the midpoint, indicating moderately positive perceptions overall. Organizational resilience had the highest mean (M = 3.82, SD = 0.71), whereas crisis response (M = 3.37, SD = 0.61) and institutional sustainable development (M = 3.35, SD = 0.72) were rated somewhat lower and at similar levels. Within ISD, respondents rated continuous improvement and learning most highly and integration and alignment least highly, suggesting that these institutions are more practiced at incremental learning than at aligning sustainability with core institutional strategy. As Table 2 shows, the three constructs were positively and significantly intercorrelated (all $p < .001$): the association between crisis response and ISD was strongest ($r = .54$), followed by organizational resilience and ISD ($r = .51$) and crisis response and organizational resilience ($r = .37$). Discriminant validity held, because the square root of each construct's average variance extracted, shown on the diagonal, exceeded its correlations with the other constructs (Fornell & Larcker, 1981).

Table 2. Means, standard deviations, correlations, and discriminant validity

Construct	M	SD	1	2	3
1. Crisis response	3.37	0.61	.69		
2. Organizational resilience	3.82	0.71	.37***	.70	
3. Institutional sust. development	3.35	0.72	.54***	.51***	.69

Note. N = 742. Square root of AVE on the diagonal. * p < .001.
Source: Prepared by the authors (2026)

4.2 Mediation Analysis

Table 3 reports the hierarchical regression models and Table 4 the decomposed effects. Controlling for respondent demographics, crisis response significantly predicted organizational resilience (a = .334, p < .001; Model 2) and, when entered alone, institutional sustainable development (total effect c = .486, p < .001; Model 1). When crisis response and organizational resilience were entered together (Model 3), organizational resilience significantly predicted ISD (b = .318, p < .001) and the coefficient of crisis response, though reduced, remained significant (direct effect c' = .380, p < .001) the pattern expected under partial mediation. Adding organizational resilience raised the variance explained in ISD from 34.9% in Model 1 to 43.2% in Model 3. Among the controls, male respondents and school-level leaders reported modestly higher ISD (for example, gender β = .122, p < .001, in Model 3), and older and more senior respondents reported higher organizational resilience; these associations were small, however, relative to the focal predictors.

Table 3. Hierarchical regression models (standardized coefficients)

Predictor	Model 1: ISD	Model 2: OR	Model 3: ISD
Crisis response	.486***	.334***	.380***
Organizational resilience	–	–	.318***
Gender (male)	.155***	.113**	.122***
Age 41–50	.031	.089*	.003
Age 51 and above	.114**	.192***	.053
School-level leader	.121***	.045	.106**
Head of second-level unit	.013	.002	.012
R^2	.349	.179	.432
Adjusted R^2	.344	.172	.427
F	65.68***	26.69***	79.79***

Note. N = 742. Reference groups: female, 40 and below, non-leader faculty/staff. p < .05, p < .01, p < .001.
Source: Prepared by the authors (2026)

Table 4. Direct, indirect, and total effects (bias-corrected bootstrap, 5,000 resamples)

Effect	Path	Estimate	SE	95% CI LL	95% CI UL	p
Total	CR → ISD	.486	.030	.424	.548	< .001
Direct	CR → ISD	.380	.030	.319	.441	< .001
Indirect	CR → OR → ISD	.106	.016	.076	.136	< .001

Note. The indirect effect accounts for approximately 21.8% of the total effect. A confidence interval excluding zero indicates a significant effect.
Source: Prepared by the authors (2026)

The bias-corrected bootstrap confirmed the indirect path. The indirect effect of crisis response on ISD through organizational resilience was significant (estimate = .106, SE = .016, 95% CI [.076, .136]), and because the interval excluded zero, H4 was supported (Table 4). With the direct effect also significant, the pattern is one of complementary, partial mediation (Zhao, Lynch, & Chen, 2010): organizational resilience transmitted approximately 21.8% of the total effect of crisis response on ISD, while the

larger share operated directly. Substantively, this indicates that building resilience is one genuine route through which crisis response supports sustainable development, though not the only one.

4.3 Summary

All four hypotheses were supported, as summarized in Table 5. Crisis response was positively associated with organizational resilience (H1) and with institutional sustainable development (H2); organizational resilience was positively associated with ISD (H3); and the indirect path from crisis response through resilience to ISD was significant, indicating partial mediation (H4). Together, the results are consistent with a dynamic-capabilities account in which crisis response supports sustainable development both directly and through the resilience it helps to build.

Table 5. Summary of hypothesis tests

Hypothesis	Path	Result
H1	Crisis response → Organizational resilience	Supported
H2	Crisis response → Institutional sustainable development	Supported
H3	Organizational resilience → Institutional sustainable development	Supported
H4	Crisis response → Organizational resilience → ISD (mediation)	Supported

Source: Prepared by the authors (2026)

4.4 Discussion

As a whole, our findings suggest that, in resource-constrained universities, the capacity to sense and respond to disruption is not simply a defensive capability but a strategic capability that can protect and renew institutional viability. Crisis response was positively associated with both organizational resilience and institutional sustainable development (ISD), while resilience was also positively associated with ISD. Resilience partially mediated the relationship between crisis response and ISD, supporting all four hypotheses. Taken together, these findings suggest that universities that respond effectively to disruption can build resilience, which in turn supports longer-term educational, organizational, financial, and social performance (Duchek, 2020; Ortiz-de-Mandojana & Bansal, 2016). The partial mediation also indicates that crisis response contributes to sustainability through both resilience-building and more immediate channels, such as protecting enrollment, revenue, and reputation (Bundy et al., 2017; Coombs, 2007).

This pattern extends a dynamic-capabilities view of institutional sustainability. Resilience is not simply an existing organizational attribute; it can be developed through the routines and capabilities that institutions enact when responding to disruption (Williams et al., 2017). From this perspective, each coordinated crisis response can become an investment in future adaptive capacity. The relationship between resilience and ISD further suggests that institutions that can absorb shocks, preserve their mission, support organizational members, sustain relationships, and learn from adversity are better positioned to achieve longer-term development (Chen et al., 2021). The partial

mediation is particularly important because it shows that resilience is one mechanism through which crisis response contributes to sustainability, but not the only one (Zhao et al., 2010).

The findings also provide a bridge between dynamic capabilities and competitive intelligence. These perspectives are complementary: competitive intelligence explains how environmental information is planned, collected, analyzed, disseminated, and utilized, whereas dynamic capabilities explain how organizations use such processes to sense changes, seize opportunities, and transform their capabilities. In this framework, crisis response represents the utilization of environmental intelligence through coordinated action, while resilience represents the learning and adaptation that can emerge from that action. The substantial direct effect of crisis response, together with the partial mediation through resilience, is consistent with this interpretation. Intelligence can support sustainability through immediate strategic action, while repeated cycles of action and learning can also build longer-term adaptive capacity. Sustainable development therefore depends not simply on reacting to crises, but on institutionalizing an intelligence cycle through which environmental signals are identified, analyzed, acted upon, and fed back into organizational learning and governance.

This interpretation is also consistent with, while extending, emerging international research on university resilience. Qualitative research on universities in the United Arab Emirates identifies anticipation, knowledge, and learning as important capabilities for navigating crises (Shaya et al., 2023), while research on smaller private non-profit universities in the United States links organizational resilience to sustained institutional effectiveness during periods of decline (Moran, 2016). Our study extends this literature in two ways. First, whereas much of the existing research is qualitative or based on individual cases, we provide a quantitative test of the relationship between crisis response, resilience, and sustainable development using a large sample (N = 742). Second, we examine these relationships in resource-constrained, non-elite universities in western China, a context that remains underrepresented in a literature dominated by Western and elite institutions. The consistency of the underlying relationships across these settings suggests that the crisis-response–resilience–sustainability relationship may extend beyond a particular national or institutional context, while our findings also show how these capabilities operate under more severe resource constraints.

The findings have important strategic implications for university managers. The partial mediation suggests that institutions cannot choose between immediate crisis response and longer-term capability building. Both are necessary, but they operate on different time horizons. For resource-constrained universities, this implies moving beyond one-off crisis responses toward routines that retain and accumulate organizational learning. Environmental scanning, structured analysis, and systematic feedback into planning can help institutions turn each disruption into a source of adaptive capacity. The relatively low rating for integration and alignment identifies a particularly important area for improvement: universities may be able to collect and learn from information, but they appear less effective at connecting that information to strategy and resource allocation. Managers should therefore focus not simply on gathering more information, but on strengthening the routines that convert intelligence into coordinated and evidence-based decisions.

These findings also make a specific contribution to the literature on Sustainable Competitive Intelligence. Existing research has established the importance of the intelligence cycle for organizational competitiveness (Calof & Wright, 2008; Prescott, 1999), but relatively little research

has examined how intelligence processes contribute to institutional sustainability, particularly in higher education. Our findings suggest that competitive intelligence can contribute not only to short-term competitive advantage but also to the development of enduring institutional capabilities. Specifically, the results highlight the importance of the utilization and feedback stages of the intelligence cycle: environmental intelligence becomes valuable when it informs coordinated crisis response, while the learning generated through such responses can strengthen resilience and future adaptive capacity. This extends the concept of sustainable competitive intelligence to mission-driven and resource-constrained organizations, where sustainable advantage depends less on market share than on institutional continuity, legitimacy, and the capacity to adapt.

Overall, the findings suggest that institutional intelligence systems can serve as a strategic mechanism for strengthening university sustainability. Rather than emphasizing the accumulation of more data, resource-constrained universities should develop needs-driven intelligence priorities and routines for scanning demographic, policy, financial, and reputational risks; analyzing emerging threats; and feeding intelligence into governance, planning, and resource allocation. Such an institutionalized intelligence cycle can help universities move from reactive crisis management toward continuous sensing, learning, and adaptation.

5. FINAL CONSIDERATIONS

This study examined how crisis response relates to institutional sustainable development in private universities and established organizational resilience as a partial mediator, drawing on survey evidence from 742 faculty members and administrators. Crisis response was positively associated with resilience and with sustainable development; resilience was positively associated with sustainable development; and resilience transmitted roughly one-fifth of the total association between crisis response and sustainable development, with a significant direct path remaining. Read jointly through dynamic capabilities and competitive intelligence, these results position crisis response and resilience as the utilization and feedback stages of an institution-level intelligence capability through which universities protect and extend a sustainable competitive position under uncertainty. The contributions, practical implications, and future directions developed below elaborate this account.

5.1 Theoretical Contributions

This study makes four related contributions to the literature on dynamic capabilities, organizational resilience, competitive intelligence, and sustainable competitive intelligence in higher education.

First, the study extends dynamic capabilities theory from the firm to the institutional level of higher education. Although dynamic capabilities were originally developed to explain how firms adapt to changing environments, they have increasingly been applied to universities (Guerrero & Menter, 2024; Piening, 2013). Our findings show that the sensing–seizing–transforming logic can also explain how universities respond to disruption and convert crisis experience into longer-term sustainable

development. By operationalizing this logic through institution-level constructs, the study provides empirical evidence for how dynamic capabilities function in an educational context. This addresses a broader concern that dynamic capabilities are often invoked in higher-education research without being clearly specified or empirically tested as a system of related capabilities.

Second, the study clarifies the mechanism linking crisis response to institutional sustainability by positioning organizational resilience as an intervening capability. Crisis-management and resilience research have often developed in parallel, despite calls for greater integration between the two streams (Williams et al., 2017). Our findings show that effective crisis response is associated with stronger organizational resilience, which in turn is associated with institutional sustainable development. The partial mediation further indicates that resilience is an important, but not exclusive, mechanism through which crisis response contributes to sustainability (Duchek, 2020). This distinction is theoretically important because it treats resilience as a capability that develops through organizational action and learning, rather than simply as an alternative label for either crisis response or its outcomes.

Third, the study extends these arguments to an under-researched institutional context. Much of the existing research on dynamic capabilities and resilience focuses on firms in developed economies or on relatively well-resourced and elite universities. Evidence from non-elite, resource-constrained private universities in western China remains limited (Han et al., 2023; Welch, 2024). By examining these relationships in this setting, the study provides evidence that the crisis response–resilience–sustainability relationship can operate under substantial resource constraints. The findings therefore extend the geographical and institutional scope of existing theory while providing a multidimensional measurement approach that can be applied in comparable higher-education settings.

Fourth, the study brings dynamic capabilities and competitive intelligence into a common theoretical framework and, in doing so, contributes to the emerging literature on sustainable competitive intelligence. Classical competitive-intelligence research has largely focused on firms and on the processes through which organizations collect, analyze, disseminate, and utilize environmental information (Calof & Wright, 2008; Prescott, 1999). Our findings extend this perspective to university governance and connect the intelligence process to institutional sustainability. Specifically, crisis response can be understood as the utilization of environmental intelligence through coordinated action, while resilience represents the learning and adaptation that consolidate this experience into future capability. From this perspective, competitive intelligence explains the process through which environmental signals are transformed into organizational decisions, while dynamic capabilities explain how repeated sensing, seizing, and transforming activities build and renew organizational advantage (Teece, 2007). This integration provides a process-based account of institutional intelligence that complements the capability-based perspective of dynamic capabilities. It also extends sustainable competitive intelligence beyond its traditional focus on market competitiveness by showing how intelligence processes can support continuity, legitimacy, and long-term sustainability in mission-driven, resource-constrained organizations.

5.2 Practical Implications

For administrators of resource-constrained private universities, the findings suggest that crisis preparedness should be treated as a strategic capability rather than as an ad hoc response to unexpected events. Universities can strengthen this capability by developing routines that support timely action, learning, and coordination. Student support and protection can help preserve the core educational relationship during disruption. Internal and external learning processes can strengthen the institution's ability to identify and interpret emerging threats. Delegated authority and decision-making autonomy can enable faster responses when conditions change. Collaboration with external organizations and peer institutions can also provide access to resources, knowledge, and legitimacy that individual universities may not be able to generate on their own.

The findings also suggest that crisis response and resilience should be developed together. Because resilience accounts for only part of the relationship between crisis response and sustainable development, investments in long-term resilience should complement rather than replace immediate response capabilities. In practice, universities should strengthen the different dimensions of resilience identified in this study: maintaining sufficient financial capacity to absorb shocks, protecting the institutional mission while adapting strategy, supporting faculty and staff, maintaining strong stakeholder relationships, and embedding learning from past disruptions into future planning (Chen et al., 2021). The goal is not simply to survive individual crises, but to ensure that the experience gained from each disruption strengthens the institution's capacity to respond to the next one.

More broadly, the findings point to the value of building an institutional intelligence system rather than managing crises on an ad hoc basis. Such a system should begin with clear, needs-driven intelligence priorities, similar to the key intelligence topics used in business settings (Herring, 1999). These priorities can focus attention on the demographic, policy, financial, and reputational risks that are most consequential for the institution. Universities should also establish clear responsibility for environmental scanning and early warning so that emerging threats can be identified before they escalate (Gilad, 2004).

Most importantly, intelligence needs to be connected to governance and decision-making. The relatively low rating for integration and alignment suggests that these universities may be better at learning from information than at translating that learning into coordinated strategic action. Managers should therefore focus not simply on collecting more data, but on developing routines that connect intelligence to planning, resource allocation, and organizational priorities. Regular intelligence reviews, clear channels for communicating emerging risks, and systematic feedback from crisis experience into future planning can help close this gap.

For resource-constrained institutions, this approach offers a practical and relatively low-cost way to strengthen sustainable competitive intelligence. The objective is not to build a large intelligence function or accumulate more information. Rather, it is to create a repeatable cycle in which the institution identifies what it needs to know, scans the environment, analyzes relevant signals, acts on the resulting intelligence, and incorporates what it learns into future decisions. Such a cycle can help universities move from reactive crisis management toward continuous sensing, learning, and adaptation, thereby strengthening the institutional capabilities needed for long-term sustainability.

5.3 Limitations and Future Research

As detailed in Section 3.7, several design features its cross-sectional, single-source, perceptual, and single-province character, and the absence of methodological triangulation or qualitative corroboration bound these conclusions and caution against causal interpretation. Rather than restate them here, we take them as the starting point for a research agenda.

These limitations map onto a clear agenda for future research. Longitudinal or multi-wave designs would allow the temporal ordering implied by the mediation model to be tested directly. Multi-source or objective indicators of sustainable development would reduce reliance on perceptual self-reports and strengthen inferences about common method bias. Estimating the model within a latent-variable structural equation framework would correct for measurement error, and alternative-model and sensitivity analyses would help rule out competing specifications. Finally, comparative and multi-region studies, including public–private and cross-provincial contrasts, together with the examination of boundary conditions and moderators, would clarify how far the dynamic-capabilities account travels across higher-education systems. Beyond these methodological extensions, the competitive-intelligence framing opens a distinct agenda in sustainable competitive intelligence: developing and validating direct measures of institutional intelligence capability environmental scanning, analysis, dissemination, and utilization rather than inferring them from crisis response; testing whether a functioning intelligence cycle predicts resilience and sustainable development across public and private institutions and across national systems; combining survey evidence with manager interviews and documentary analysis of governance processes to trace how intelligence is actually used; and examining how emerging analytical and AI-enabled tools (Chen & Park, 2026; Hair & Sabol, 2024) are reshaping environmental scanning and evidence-based decision-making in higher education.

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