The International Journal of Business Management and Technology, Volume 8 Issue 1 January-February 2024
ISSN: 2581-38

Research Article Open Access

Developing A Scale to Measure Organizational Agility Among Colleges and Universities

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Abstract: This study was conducted to develop a scale to measure organizational agility among colleges and universities. This study utilized the exploratory mixed-method approach following a two-phase study design. The first phase consisted of in-depth interviews with 12 school heads, deans, and member of the quality management council, selected purposively in order to develop a significant statement for the development of factor structure on organizational agility which will be used in the second phase. The formulated item statements were undergone validation using Lawshe's Content Validity Ratio (CVR). The second phase was the development of survey instruments for 167 respondents, selected randomly. In the first phase, exploratory factor analysis was used to identify the salient factors which yielded four dimensions. The four dimensions that characterized organizational agility, after 12 iterations are an *adapted leadership and innovative culture, strategic learning culture and adaptive governance, Digital Resilience, and Navigating Transformation for safety and well-being*. These dimensions were validated through a quantitative phase utilizing the confirmatory factor analysis which reinforces the robustness of the scale, affirming the significance of the identified constructs in measuring organizational agility. The examination of internal consistency within the questionnaire further strengthens the reliability of the measurement tool, ensuring that the study's findings are grounded in well-validated and internally coherent measures of organizational agility.

Keywords: *organizational agility, exploratory factor analysis, confirmatory factor analysis, higher education institutions, Philippines*

I. INTRODUCTION

Thriving in today's intricate and unpredictable business landscape necessitates institutional agility, especially in large organizations with traditional hierarchical structures struggling to adapt to the fluid and digital world (GÜL &Çetin, 2022). Simultaneously, higher education institutions grapple with global pressures such as massification, a surge in student enrollment, interdisciplinary studies, entrepreneurial demands, and escalating research costs (Mohamedbhai, 2008; Van der Zwaan, 2017; Wood & Breyer, 2017). Adaptation to national and global changes is imperative for these institutions, and agility emerges as the linchpin concept, offering a holistic approach beyond traditional frameworks of change and innovation management (Bouland-van Dam et al., 2022). It ensures survival and provides the means to proactively address challenges, foster innovation, and position institutions for sustained relevance amidst ongoing transformations in the educational landscape. Agility becomes the strategic cornerstone for continuous improvement, innovation, and resilience in a dynamic and ever-evolving world.

The COVID-19 pandemic has accentuated the critical importance of swift decision-making and adaptability in organizational structures, pivotal for success in the business sector (SILESIAN, 2021). Even before the pandemic, businesses were navigating a dynamic landscape influenced by globalization, analytics, and automation (Treadgold& Reynolds, 2020). The current global situation has intensified the need for organizational agility, urging companies to enhance their responsiveness to change (Saha et al., 2020). Simultaneously, educational institutions have wrestled with unprecedented challenges in adapting to the post-COVID era, including uncertainties, decreased enrollments, concerns about virus transmission, suboptimal teaching and learning experiences, and financial strain (Azman & Abdullah, 2021). Remarkably, traditional resilience planning has proven inadequate, necessitating strategic development for survival.

In Davao City, Llemit (2020) reported that fifteen private schools closed due to operational difficulties and the inability to sustain expenses and compensations amid reduced enrollment and financial constraints. He added that the global shift to emergency remote learning further highlighted challenges in instructional delivery, with higher education

institutions in Region XI responding proactively through various Learning Management Systems (LMS), contributing to increased student enrollment amidst broader declining trends.

In the educational context, the theory of organizational agility recognizes the imperative for institutions to navigate a rapidly changing landscape. Lyn Chan and Muthuveloo (2021) averred that it involves responding to immediate disruptions, such as the unprecedented challenges brought by the COVID-19 pandemic, and proactively preparing for future uncertainties. More importantly, organizational agility in education centers on adaptability, enabling institutions to swiftly adjust instructional methods, technological infrastructure, and administrative processes in response to evolving student needs and external factors (Arokodare&Falana, 2021).

Moreover, organizational agility in education extends beyond mere responsiveness; it encompasses a commitment to continuous innovation. Mao et al. (2021) buttressed that educational institutions must foster a culture that encourages experimentation with new teaching methodologies, technologies, and collaborative approaches. This proactive stance toward innovation enables institutions to stay ahead of the curve, ensuring they survive and thrive in an ever-changing educational landscape (Jayabalan et al., 2021). The theory underscores the importance of strategic planning, collaboration, and resource flexibility as critical elements in building resilient educational organizations capable of providing high-quality learning experiences despite the uncertainties inherent in the modern educational environment (Williams et al., 2017).

Sherehiy (2008) and Ragin-Skorecka (2016) have identified key components crucial to organizational agility, highlighting the pivotal roles played by people, intangible resources, and corporate culture. The workforce's knowledge, skills, and competencies must transcend individual capabilities to form a collective learning environment. Organizations must devise and implement forward-thinking HR practices and strategies to effectively channel employee capabilities in innovative directions. Building on this foundation, the formulation of appropriate training and development initiatives, as emphasized by scholars such as Rogers (2000), Elanga and Imran (2013), Nijssen and Paauwe (2012), and Shafer et al. (2001), becomes instrumental. By adopting these practices, organizations can cultivate and refine the skills and capabilities of their workforce, as noted by Anantharam and Nenkervis (2013) and Qin and Nembhard (2015), thereby contributing to heightened productivity, increased profitability, and the long-term sustainability of the organization.

Approximately two decades ago, agility emerged in business literature, seeking to address the fundamental question of how organizations can thrive in an ever-changing world. Researchers in the 1990s proposed that agility provides a strategic framework for organizations to navigate uncertainty and competition effectively. Gunasekaran (1999) defined production agility as the ability to respond swiftly and effectively to customer-oriented markets, adapting to the dynamic and unpredictable conditions of competition. According to Yusuf et al. (1999), agility involves integrating competitive elements such as speed, flexibility, innovation, and quality, utilizing reconfigurable resources to produce customer-centric products and services in constantly evolving markets. Initially, literature on agility emphasized speed and flexibility as its primary facets (Yusuf et al., 1999; Gunasekaran, 1999; Sharifi & Zhang, 2001). However, Youssef (1994), as cited in Ganguly et al. (2009), argued against narrowly associating agility with speed, asserting that true agility entails profound structural changes beyond mere rapidity. Moreover, another critical attribute linked to agility is delivering high-quality, customer-oriented products (Sherehiy, 2002).

Early theoretical efforts in the Organizational Agility (OA) field have played a focal role in unraveling the dimensions and empirical considerations vital for businesses across sectors. Weber and Tarba (2014) defined OA as the capability to act flexibly in response to new developments, a definition shared by many researchers in the field. Meanwhile, Cummings and Worley (2014) conceptualized OA as timely, effective, and sustainable organizational change, while Teece et al. (2016) emphasized flexibility and organizational change as essential components within the agility context. The pursuit of understanding the requisites for this capacity led to the identification of OA dimensions and performance indicators. Various conceptual frameworks for OA in different contexts have emerged, such as Goldman et al.'s (1995) strategic dimensions for agile manufacturing and Jackson and Johansson's (2003) four dimensions: emphasizing product-related change capabilities, operational change competency, internal and external cooperation, and people, knowledge, and creativity. Harraf et al. (2018) delineated the pillars of an agile organization, focusing on aspects like a culture of innovation, empowerment, and structural fluidity. Baskarada and Koronios (2017) proposed a more recent conceptual framework centered on five OA capabilities: sensing, searching, seizing, shifting, and shaping. Building on this conceptual groundwork, researchers have developed empirical models for measuring OA, ranging from uni-dimensional scales to multi-dimensional models, tailored for diverse business enterprises, including manufacturing and supply-chain industries (Chung et al., 2014; Alzoubi et al., 2011; Gligor et al. 2013; Sambamurthy et al., 2003; Worley & Lawler, 2010).

In light of their significant ties to industries and their pivotal roles in the contemporary world, higher education (HE) institutions must leverage insights from Organizational Agility (OA) literature to not only survive but also adapt and thrive (Molla&Peszynski, 2012). By analyzing the business indicators of agility and contextualizing them

into the context of educational institutions, universities can enhance their responses to highly competitive and innovation-driven higher education systems (Abdelhamid&Sposato, 2019). However, Saint (2009) pointed out that the centralized structure of the Philippine HE system poses challenges, limiting the autonomy and flexibility of colleges and universities. Recognizing the impracticality of directly applying an idealized OA framework from business literature to Philippine HE institutions, this study took a nuanced approach.

A glaring gap exists in the need for a standardized tool to measure organizational agility among colleges and universities effectively. The rapid evolution of challenges, particularly in the face of the pandemic, underscores the critical need for such a tool. Institutions navigate uncharted waters without a compass and a reliable means to assess and quantify organizational agility. This research endeavored to bridge this gap by developing a robust scale tailored to the unique context of educational organizations, aiming to provide a much-needed instrument for gauging and enhancing organizational agility. It involved creating an extensive item pool derived from interviews with school heads, deans, members of the quality management council, and ten experts, assessing items for cultural appropriateness, the unique nature of HE institutions, and pedagogy. The primary focus of this study was to develop a culture-sensitive, multi-dimensional OA framework tailored for HE institutions in Region XI. Given their divergence from the business enterprise model, state colleges and universities were excluded from the study. Consequently, this research aimed to contribute to the literature by crafting a measurement tool to assess the perceptions of academic and administrative staff, ultimately establishing a distinctive, pedagogy-based management framework for private colleges and universities.

The study's central objective was to develop a comprehensive scale for measuring organizational agility within the context of colleges and universities in Region XI. To achieve this, the research addressed central questions: What factors contribute to organizational agility among colleges and universities in Region XI? What are the reliability and validity characteristics of the Organizational Agility Scale among colleges and universities? What model characterizes organizational agility among colleges and universities in Region XI? By answering these questions, the research sought to provide valuable insights that can guide educational institutions in the Philippines toward maintaining relevance in their respective communities during challenging times.

The significance of this study extends beyond the confines of academia, reaching into the broader landscape of educational policy and practice. As colleges and universities struggle with the aftermath of the pandemic and the evolving educational landscape, the ability to measure and enhance organizational agility becomes paramount. Institutions armed with a validated scale tailored to their unique needs can make informed decisions, strategically positioning themselves to weather current challenges and proactively shape their future trajectory. This research aimed to contribute to the resilience and adaptability of educational institutions, offering a timely and invaluable resource for organizational leaders, policymakers, and stakeholders invested in the sustained success of higher education. Further, this study significantly impacted the attainment of the Sustainable Development Goal (SDG) 4: Quality Education. This research labored to contribute substantially to the resilience and adaptability of educational institutions. It serves as a timely and invaluable resource for organizational leaders, policymakers, and stakeholders deeply invested in fostering the sustained success of higher education, aligning with broader global aspirations for quality and inclusive education.

II. Methods

2.1 Study Participants

The respondents of this study were the school leaders and employees of the selected colleges and universities in Region XI. For the first and qualitative part of the study, the researcher interviewed school leaders by answering several questions on the organizational agility of their respective institutions. As for the second and quantitative part of the study, the researcher surveyed the employees of the selected colleges and universities in Region XI to determine the dimensions and model of organizational agility.

In the first part of the study, the researcher used purposive sampling, a non-probability sampling technique, to select the participants. The purposive sampling technique chose participants with the best experience with the phenomenon or subject matter to be explored (Ivankova et al., 2006); Sargeant, 2012; Cresswell& Plano Clark, 2011; Bernard, 2002; Spradley, 1979). An in-depth interview was conducted among 12-15 top officials and employees of the different schools in Region XI. It ensured that all details of the experiences of the top officials and employees were captured in phase 1 of the study.

The study's second phase used random sampling since it involved hypothesis testing in determining the dimensions and model of organizational agility. Furthermore, in the quantitative part of the study, the researcher gave a survey questionnaire from the output of in-depth interviews and readings of literature to 300 employees.

2.2 Materials and Instruments

The springboard of this study was the readings of literature and theories of organizational agility. It served as the basis for formulating the different statements of the problems and the interview guide questionnaire. In the study's first phase, interviews were primarily done in qualitative research. They occurred when researchers asked one or more participants with general, open-ended questions and recorded their answers. Often, audiotapes were utilized to allow for more consistent transcription (Creswell, 2012). In this design, the interview questions were based on the data needed to be enshrined in the qualitative study questions (Creswell, 2013). The significant statements of the research participants and readings of the literature were the basis for formulating the item statements. This served as the Item Pool Statements. The Item Pool Statements were subjected to a validity test using Lawshe's content validity ratio (CVR). After the CVR, the final Item Pool Statements were given to the respondents as a survey questionnaire for the quantitative part of the study. The item statements of this questionnaire came from responses to the qualitative part, which the researcher carefully crafted. The survey questionnaire also utilized the 5-scale Likert Scale as shown below:

Scale	Description	DescriptiveInterpretation
5	Strongly Agree	The item described means that the respondent strongly agrees with the given statement.
4	Agree	The item described means that the respondent agrees to a certain extent to the given statement.
3	Neither Agree or Disagree	The item described means that the respondent neither agrees nor disagrees with the given statement.
2	Disagree	The item described means that the respondent disagrees to a certain extent with the given statement.
1	Strong Disagree	The item described means that the respondent strongly disagrees with the given statement.

2.3 Design and Procedure

This study utilized mixed methods, particularly exploratory research design, that combined the paradigms of quantitative and qualitative research designs. Jogulu and Pansiri (2011) note that a mixed-method research design helps the inquirer generate theory and test hypotheses within the study unit. Creswell and Clark (2017) further that when the approaches in quantitative and qualitative research designs are combined in a single study, a more in-depth understanding of the problems could be generated rather than using either of the two.

To realize the exploratory research design, the research started with a qualitative inquiry where he interviewed top officials and employees of the selected colleges and universities in Region XI on their responsiveness and initiative to be relevant in attaining their vision and goals. After that, the researcher carried out a quantitative survey to determine the dimensions and model of organizational agility in the pandemic context.

The researcher read literature on organizational agility in detail as the springboard of this study to affirm that the assumption of the theory was explored and understood since the theory founded the formulation of the interview guide questionnaire. After this, the researcher conducted an in-depth interview among the top officials and employees, and their responses were then analyzed through Colaizzi's strategies, where the researcher determined the different programs and initiatives to be agile. Additionally, to ensure the paper's credibility, the researcher interviewed participants who were not under his supervision.

Then, different item statements in the Item Pool Statements (IPS) were developed through and from the significant statements from the research participants' responses and the literature readings. These statements were subject to Lawshe'scontent validity ratio. Ten experts in item development and organizational agility rated whether the items were essential or not. The item statements from the output of the content validity ratio were then used in the quantitative part of the study. The dimension of organizational agility was determined using Exploratory Factor Analysis. Further, the model of organizational agility was determined through Confirmatory Factor Analysis.

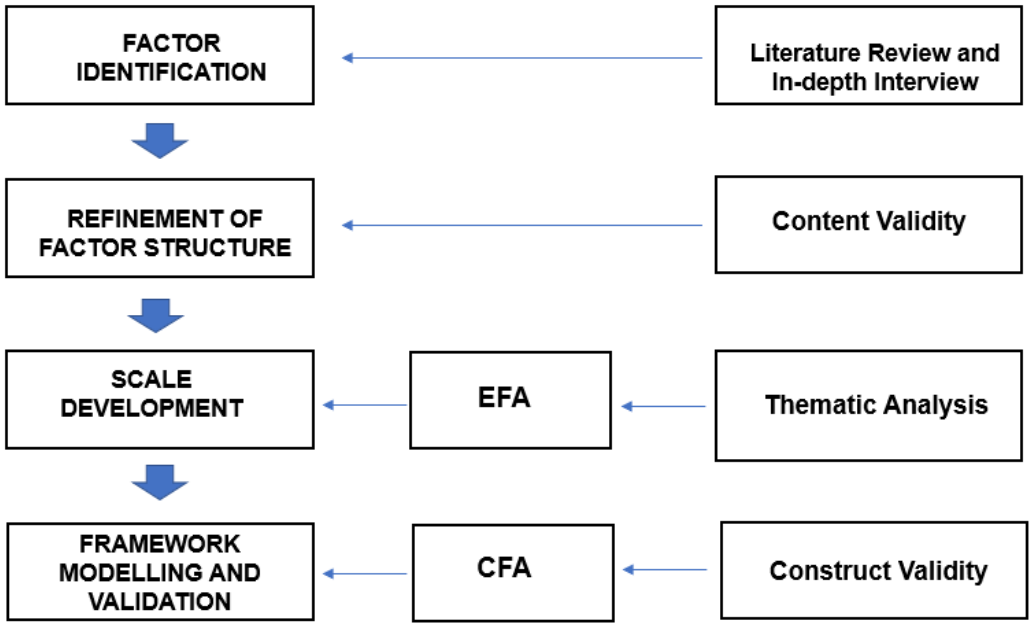
Subsequently, the researcher submitted all required documentation to UMERC (University of Mindanao Ethics Review Committee) to secure their endorsement and the necessary certificate for data collection. Additionally, an official request letter seeking permission to conduct the study was sent to department heads and administrative officers,

accompanied by endorsements from various colleges and universities in Region XI. Upon receiving authorization for data collection from the officials, the researcher initiated the data-gathering process.

A thematic analysis was carried out to analyze the gathered data and explore perspectives on organizational agility. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were employed to identify the factors of Organizational Agility and determine the most suitable model. This approach aided in identifying and understanding the underlying factors characterizing Organizational Agility relevant to Higher Education institutions. The EFA facilitated thorough data exploration, unveiling patterns, relationships, and latent constructs contributing to students' perspectives on this subject. Moreover, the CFA established a model based on various parameters such as Chi-square, TLI, and RMSEA.

Pertinently, the researcher adhered to applicable ethical considerations. First, participation was entirely voluntary, meaning that the participants were not obligated to participate in the interview, and they had the volition to decline. Second, the confidentiality of the respondents' information, including name, age, and program, was observed. Third, informed consent was obtained from the participants. Meanwhile, the researcher is confident that the study poses no high risks, such as physical, psychological, or socioeconomic concerns, and that this study is an original work, free from plagiarism or fabrication. Fourth, this paper outlined explicit provisions on authorship, attributing authorship credit solely to substantial contributions, such as conception and design, data acquisition, analysis and interpretation, drafting or critical revision of the article, and final approval of the published version. It ensured accountability and recognition for those who significantly contributed to the research process, aligning with principles of scholarly integrity. The model procedure of the study which the researcher implemented is illustrated in Figure 1.

Figure 1
The Scale Development and Validation Process



III. RESULTS AND DISCUSSIONS

Creating the set of statements for the organizational agility item pool involves a process combining interviews and reviewing relevant literature. The formulation of these item statements relies on an initial stage that is informed by references from published journals, specifically El-Hassan (2014), Malibary et al. (2019), and Sirgy et al. (2007).

Additionally, ten validators, recognized experts with varied backgrounds in strategic management, research, quality assurance, test development, institutional sustainability assessment, education, accreditations, and learning analytics, thoroughly examined the content of the item pool statements (IPS). This process aligns with Lawshe's (1975) recommendation that the tool's content should undergo evaluation and scrutiny by field experts. Consequently, the validation criterion requires agreement among at least ten expert panels with a minimum validity score of 0.80 for an item. Items falling short of these validity requirements were either revised or excluded from the final set.

3.1 Sampling Adequacy and Suitability Test Results

Table 1 displays the outcomes of the test for sampling adequacy and suitability. The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO=0.915) was employed to evaluate the appropriateness and fitness of the exploratory factor analysis conducted on a sample of 167 respondents. The results affirm that the data is well-suited for exploratory factor analysis, surpassing the minimum requirement of 0.5. This finding also suggests that the data is substantial for identifying a distinct factor, as per Kaiser's (1974) criteria. Additionally, Bartlett's sphericity test reveals that the R-matrix is not an identity matrix, indicating that the analysis uncovers multiple factors. Furthermore, it indicates the presence of patterned relationships between variables ($p<0.01$).

Table 1
Sampling adequacy and multidimensionality tests for the Organizational Agility (OA)

Test		Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.915
Bartlett's Test of Sphericity	Approx. Chi-Square	14303.422
	df	2485
	Sig.	0.00

3.2 Rotated Component Matrix

Following the completion of the exploratory factor analysis, a set of 26 items was identified, and these were categorized into eight distinct factors or dimensions that contribute to the evaluation of organizational agility (Appendix F). In order to enhance the reliability of the analysis, any item with factor loadings below 0.6 was systematically removed from consideration, adhering to the rigorous criterion set forth by Gono and Pacoy (2021), Fuentes and Gono (2023), Romero and Gono (2021) and Costello and Osborne (2005). Specifically, a factor loading value of 0.60 or higher was considered indicative of an influential association and retained for further investigation. Further, any factor with item statements below three is disregarded (MacCallum et al., 1999; Raubenheimer, 2004). It resulted in four distinct factors.

Table 2 in the research findings presents a comprehensive thematic analysis of the item statements, shedding light on the nuanced aspects of organizational agility derived from the exploratory factor analysis. The first factor, "*Adaptive Leadership and Innovative Culture*," encompasses 12 item statements (67, 69, 13, 29, 71, 70, 68, 15, 52, 52, 40, and 47). These items collectively highlight the critical role played by Adaptive Leadership and the fostering of an innovative culture in shaping organizational agility. This factor suggests that organizations exhibiting these characteristics are more likely to excel in adapting to dynamic environments.

Adaptive Leadership and lnnovative Culture are integral factors contributing to organizational agility, a critical capability for thriving in today's dynamic and unpredictable business landscape (Khalid et al. 2020). Adaptive Leadership, characterized by the ability to navigate change and uncertainty, is essential for guiding an organization through challenges and seizing opportunities (Uyun, 2018). Leaders who embrace adaptive practices empower their teams to quickly adjust strategies and operations in response to evolving circumstances (Salicru, 2017). This leadership style fosters a culture of resilience and agility, enabling the organization to stay ahead of market shifts and emerging trends. Adaptive leaders prioritize continuous learning, cultivate a growth mindset, and encourage a shared understanding that change is a constant. By fostering an environment where adaptability is valued, adaptive leadership becomes a cornerstone in building organizational agility (Juliana et al. 2023).

Innovative Culture, on the other hand, plays a pivotal role in organizational agility by cultivating a mindset of creativity, experimentation, and continuous improvement (Morris et al. 2014). A culture that encourages innovation empower employees at all levels to contribute novel ideas and solutions. Innovative organizations embrace a dynamic approach to problem-solving, viewing challenges as opportunities for creativity and learning (Dombrowski et al., 2007). This culture facilitates the development of groundbreaking products and services and instills a proactive attitude toward change. Teams within an innovative culture are more likely to embrace uncertainty and ambiguity, driving a collective commitment to adapt and thrive in rapidly changing conditions (Edmondson, 2012). Together, Adaptive Leadership and Innovative Culture create a synergistic environment that propels organizational agility, positioning the company to navigate complexities and seize opportunities in an ever-evolving business landscape.The second factor comprises seven items (26, 19, 45, 18, 21, 64, and 20) and is labeled "*Strategic Learning Culture and Adaptive Governance*." These items have been carefully chosen to assess the presence and impact of a strategic learning culture and adaptive governance on organizational agility, providing a more

Table 2
Thematic Analysis of the Organizational Agility

Item Number	***Factor 1- Adaptive Leadership and Innovative Culture*** Item Statements	r- value
67	Leadership has actively supported the transition to new teaching methods and innovative practices.	0.733
69	Leadership has been pivotal in championing the transition to online learning methods.	0.727
13	Teamwork plays a crucial role in addressing challenges post-pandemic.	0.714
29	Scholarships, research, and global engagement opportunities are continually encouraged.	0.68
71	Diverse leadership styles are employed based on situational needs within the school.	0.678
70	Transformative leadership has emphasized compassion and support during challenging times.	0.673
68	A participative approach has been adopted for inclusive decision-making processes.	0.655
15	Risk assessments address uncertainties in educational guidelines and assist in proactive planning.	0.64
52	Innovation is a critical factor in ensuring stability and continuity within the institution.	0.621
40	Open communication and collaboration streamline procedural development within the school.	0.618
47	Innovation remains a core value and driving force in the school's culture.	0.615
Item Number	***Factor 2- Strategic Learning Culture and Adaptive Governance*** Item Statements	r- value
26	Identifying learning needs through stakeholder collaboration ensures a well-rounded educational approach.	0.711
19	Encouraging employees to learn from past experiences is a key focus within the school.	0.706
45	Ongoing exploration and expansion of innovative practices persist.	0.693
18	The school's five-year strategic plans fortify its resilience against future challenges.	0.689
21	The school received recognition despite the challenges faced post-pandemic.	0.68
64	Customer feedback significantly influences decision-making within the institution.	0.648
20	Transparent communication continues to be a vital tool against disruption and uncertainty.	0.621
Item Number	***Factor 3- Digital Resilience*** Item Statements	r- value
4	The establishment of robust online learning frameworks ensured a seamless integration of blended learning.	0.734
2	School policies were adapted to support remote work and innovative teaching methods for ongoing improvement.	0.719
3	Online meeting applications facilitated increased connectivity and communication in the school environment.	0.623
1	The university adopted remote learning tools for enhanced educational accessibility.	0.618
Item Number	***Factor 4- Navigating Transformation for Safety and Well-being*** Item Statements	r- value
9	Classroom adjustments were made, including reduced capacities, to prioritize safety and well-being.	0.717
10	The school resumed face-to-face operations with stringent health precautions and safety measures.	0.681
11	Post-pandemic change management now emphasizes the well-being of employees.	0.633

nuanced understanding of the essential components contributing to organizational adaptability. Strategic Learning Culture and Adaptive Governance jointly serve as pivotal factors contributing to organizational agility (Cetindamar et al., 2021). A Strategic Learning Culture instills an organization's proactive mindset of continuous learning and strategic thinking. It promotes cultivating capabilities essential for navigating a rapidly evolving business landscape (Akbar et al., 2024). Teams in such a culture are encouraged to embrace a collective and strategic approach to learning, ensuring that insights gained from external developments are swiftly integrated into decision-making processes. This cultural emphasis on learning facilitates adaptability and positions the organization to capitalize on emerging opportunities, reinforcing its agility in responding to dynamic market conditions.

Complementing this culture, Adaptive Governance provides the necessary structural framework for flexible decision-making (Rijke et al., 2012). Traditional governance models often prove restrictive in an agile context. Adaptive Governance, on the other hand, encourages decentralized decision-making, quick response mechanisms, and a willingness to experiment (Thomson, 2017). It acknowledges the need for dynamic structures that promptly adjust strategies and resource allocations based on real-time feedback. By fostering adaptability in governance processes, organizations can respond rapidly to changing circumstances, aligning decision-making with the principles of agility (Teece et al., 2016). Together, a Strategic Learning Culture and Adaptive Governance create a synergistic foundation, enabling organizations to learn strategically and govern adaptively, ultimately enhancing their overall agility in a dynamic and competitive landscape.

The third factor, termed "*Digital Resilience*," encompasses four items (1, 2, 3, and 4), signifying the increasing importance of the organizational ability to navigate and adapt to digital environments. This factor underscores the role of digital resilience in enhancing organizational agility in the face of technological advancements. Digital Resilience serves as a valuable measure of organizational agility in the digital era, reflecting an organization's ability to adapt to digital disruptions and leverage digital opportunities for sustained success (Miceli et al., 2021). As a measure of agility, digital resilience encapsulates the organization's capacity to recover from digital setbacks swiftly, embrace technological advancements, and strategically use digital tools for innovation. In a landscape where technological changes are frequent and impactful, organizations with high Digital Resilience demonstrate an ability to navigate uncertainties in the digital realm, ensuring continuous operations and minimizing disruptions (Boh et al., 2023). This resilience is a vital component of agility, emphasizing the adaptability to external technological shifts and the internal capabilities to proactively harness digital resources for strategic advantage.

Measuring Digital Resilience as a facet of organizational agility involves assessing the organization's readiness to face digital challenges, respond to cybersecurity threats, and capitalize on digital opportunities (Chan et al., 2019). Resilient organizations can quickly realign their digital strategies, technologies, and workforce skills to match the evolving digital landscape. This measurement provides insights into the organization's ability to thrive in a technology-driven environment, stay ahead of the curve, and strategically incorporate digital advancements into its operations (Aithal, 2023). Ultimately, digital resilience as a measure of organizational agility signifies an organization's preparedness to survive in the digital age and flourish by turning digital disruptions into opportunities for growth and innovation.

The fourth factor, composed of three items (9, 10, and 11), is dedicated to "Navigating Transformation for Safety and Well-being." These items are designed to measure the organization's capabilities in guiding transformative processes while ensuring the safety and well-being of its members, providing valuable insights into the multifaceted nature of organizational agility (Chatwani, 2019; Mukherjee, 2023). Navigating Transformation for Safety and Well-being emerges as a critical measure of organizational agility, reflecting an organization's commitment to adaptability while prioritizing the safety and well-being of its workforce. In the ever-changing business and technology landscape, organizations must undergo transformations to stay competitive. This measure encompasses an organization's ability to navigate these transformations successfully, ensuring that the process not only enhances operational efficiency but also safeguards the safety and well-being of its employees (Uimonen, 2024; Mukherjee, 2023). Agile organizations recognize that a transformative journey can be disruptive, and as such, they implement strategies that foster a culture of safety and well-being throughout the process. It includes measures to mitigate risks associated with change, providing necessary support mechanisms, and promoting a positive work environment that values employees' physical and mental health.

3.4 Latent Roots Criterion of the Extracted Factors

Shown in Table 3 is the latent roots criterion of the extracted factors depicting the percentage of Variance. The first factor has an initial eigenvalue of 41.765 and a variance of 58.823%. The second factor has an initial eigenvalue of 2.472 and a variance of 3.482%. The third factor has an initial eigenvalue of 2.309 and a variance of 3.253%.The fourth factor has an initial eigenvalue of 1.962 and a variance of 2.763%.

Table 3
Latent Roots Criterion of the Extracted Factors

Factor	Initial Eigenvalues	% of Variance	Cumulative %
1	41.765	58.823	58.823
2	2.472	3.482	62.306
3	2.309	3.253	65.558
4	1.962	2.763	68.321

To further validate the measures of organizational agility, the researcher conducted a confirmatory factor analysis, which aimed to explain the relationships among the underlying constructs. This analytical process allowed us to delve into each construct's internal consistency and convergent validity. The results, outlined in Table 4, revealed that all item statements significantly contribute to different factors, as indicated by a p-value < 0.05. This implies that each item is an excellent measure of its corresponding indicator of organizational agility.

Table 4
Results of Composite Reliability and Convergent/Discriminant Validity Testing

Factor 1. Adaptive Leadership and Innovative Culture						
Item Number	Estimate	SE	p	95% CI		Cronbach's Alpha
				Lower	Upper	
Item 67	0.89	0.01	< .001	0.86	0.91	0.93
Item 69	0.85	0.01	< .001	0.82	0.88	
Item 13	0.83	0.01	< .001	0.81	0.86	
Item 29	0.78	0.02	< .001	0.75	0.81	
Item 71	0.87	0.01	< .001	0.85	0.9	
Item 70	0.85	0.01	< .001	0.82	0.87	
Item 68	0.83	0.01	< .001	0.8	0.86	
Item 15	0.92	0.01	< .001	0.89	0.94	
Item 52	0.88	0.01	< .001	0.85	0.9	
Item 40	0.83	0.01	< .001	0.8	0.85	
Item 47	0.88	0.01	< .001	0.85	0.91	
Factor 2. ***Strategic Learning Culture and Adaptive Governance***						
Item Number	Estimate	SE	p	95% CI		Cronbach's Alpha
				Lower	Upper	
Item 26	0.86	0.02	< .001	0.83	0.89	0.88
Item 19	0.86	0.02	< .001	0.83	0.89	
Item 45	0.88	0.01	< .001	0.85	0.91	
Item 18	0.82	0.02	< .001	0.8	0.85	
Item 21	0.8	0.02	< .001	0.77	0.83	
Item 64	0.86	0.02	< .001	0.83	0.88	
Item 20	0.84	0.01	< .001	0.81	0.87	
Factor 3. Digital Resilience						
Item Number	Estimate	SE	p	95% CI		Cronbach's Alpha
				Lower	Upper	
Item 4	0.88	0.02	< .001	0.85	0.92	0.84
Item 3	0.89	0.02	< .001	0.86	0.93	
Item 2	0.92	0.02	< .001	0.88	0.95	
Item 1	0.82	0.02	< .001	0.79	0.86	

Factor 4. Navigating Transformation for Safety and Well-being						
Item Number	Estimate	SE	p	95% CI		Cronbach's Alpha
				Lower	Upper	
Item 9	0.85	0.02	< .001	0.81	0.89	0.79
Item 10	0.87	0.02	< .001	0.82	0.91	
Item 11	0.88	0.02	< .001	0.84	0.92	

The assessment of internal consistency through Cronbach's alpha further substantiated the robustness of our measures. For each construct, multiple indicators displayed adequate internal consistency. Notably, all four constructs met the minimum Cronbach's coefficient reliability threshold of 0.70, affirming a satisfactory level of internal consistency for the entire scale used in measuring organizational agility.

To ascertain convergent validity, the researcher meticulously examined all factors involved in the study. As depicted in Table 5, each latent construct, including Adaptive Leadership, Innovative Culture, Strategic Learning Culture, Adaptive Governance, Digital Resilience, and Navigating Transformation for Safety and Well-being, demonstrated statistical significance. It implies that the chosen measures, as selected by the researcher, effectively converge upon the intended aspects of organizational agility. Convergent validity, in this context, refers to the degree to which different measures theoretically expected to be related indeed exhibit significant associations. The researcher's meticulous examination confirms that multiple indicators within each construct align and converge on common ground, substantiating the validity of the measurement model.

Table 5
Convergent/Discriminant Validity

Factors			**Estimate**	**SE**	**p-value**	**95% CI**	
						Lower	**Upper**
F1	↔	F2	0.98	0.01	< .001	0.95	1.00
F1	↔	F3	0.91	0.02	< .001	0.86	0.96
F1	↔	F4	0.95	0.02	< .001	0.92	0.99
F2	↔	F3	0.96	0.03	< .001	0.91	1.02
F2	↔	F4	0.95	0.02	< .001	0.91	0.99
F3	↔	F4	0.95	0.03	< .001	0.89	1.01

As illustrated in Table 5, each latent construct, ranging from Adaptive Leadership and Innovative Culture to Strategic Learning Culture and Adaptive Governance, as well as Digital Resilience and Navigating Transformation for Safety and Well-being, exhibited statistical significance. This compelling outcome indicates that our study has a robust and satisfactory level of convergent validity (Gerbing& Anderson, 1988). The significance of these latent constructs affirms that our chosen measures effectively converge upon the intended aspects of organizational agility. This alignment is crucial as it demonstrates that multiple indicators within each construct are converging on a shared conceptual space, supporting the overall validity of our measurement model.

3.5 Measurement Model of the Organizational Agility

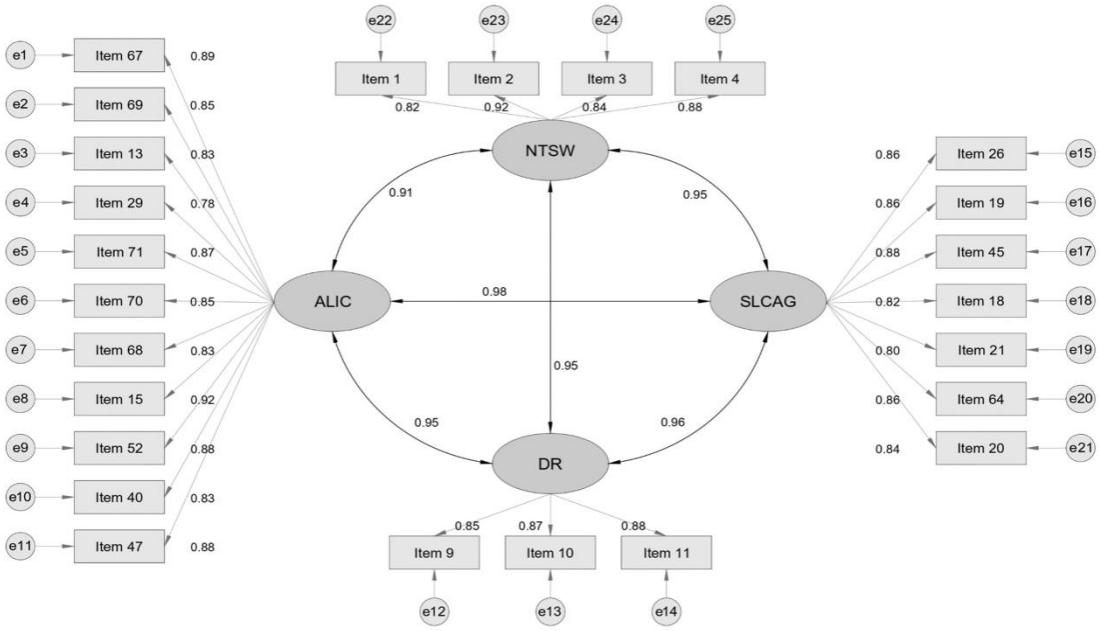
Confirmatory Factor Analysis (CFA) plays a pivotal role in evaluating the alignment of the measurement model with the previously conducted Exploratory Factor Analysis. Operating in a deductive mode, CFA tests hypotheses related to unmeasured sources of variability responsible for the commonality among test scores and the relationships of the constructs. Before analysis, the researcher hypothesizes the number of factors and the loading pattern, imposing constraints on the solution (Hoyle, 2000). Inconsistencies between these constraints and sample data can result in a poor fit, leading to model rejection.

During the initial analysis, specific indicators of good fit fell short of requirements, prompting the researcher to address this by correlating error terms based on modification indices. Multiple iterations were undertaken to derive the optimal model for teaching competence. Establishing the best-fit model accurately reflects expected Organizational Agility based on the observed data. Various model fit indices, including the Goodness of Fit Index (GFI) and the Root Mean Square Error of Approximation (RMSEA), serve as guiding metrics for the researcher. GFI values exceeding 0.9 are indicative of a good fit (Tanaka, 1993). RMSEA assesses the discrepancy between observed and implied covariance

matrices per degree of freedom, with 0.05 signaling close fit, 0.08 suggesting marginal fit, and 0.10 indicating poor fit (Browne &Cudeck, 1983).

Figure 2

Measurement Model of Organizational Agility Five Factors First Order



Legend:

ALIC- Adaptive Leadership and Innovative Culture

SLCAG- Strategic Learning Culture and Adaptive Governance

DG- Digital Resilience

NTSW- Navigating Transformation for Safety and Well-being.

Ensuring unidimensionality involves scrutinizing factor loadings, with items below 0.7 considered for deletion (Hoyle, 2000). Correlating error terms of the same dimension, as identified by modification indices, aids in refining the model. In retrospection, involving the liberation or fixation of parameters, is a common aspect of CFA (Bollen& Long, 1993).

The final model fit indices for the measures of Organizational Agility (four-factor rotation) are depicted in Figure 4. Using JASP software, the values obtained were $\chi 2$ = 247.69 (p-value=0.820), GFI=.987, TLI = 0.996, and RMSEA= .0001 (p close = 0.98). All coefficients align within acceptable levels, affirming that the model fits well.

In the final model, a noteworthy observation emerges as the interrelationships between latent factors demonstrate a high level of statistical significance, with all p-values registering below the conventional threshold of 0.05. This statistical significance indicates that the relationships between these latent factors do not occur by random chance but are systematically present

The significance of these interrelationships is crucial in the context of discriminant validity. Discriminant validity assesses the extent to which distinct latent variables measure different concepts or dimensions. When examining the p-values in this context, values below 0.05 suggest that the factors are effectively measuring in the same direction as the other latent variables. In other words, they exhibit a consistent and coherent pattern of relationships.

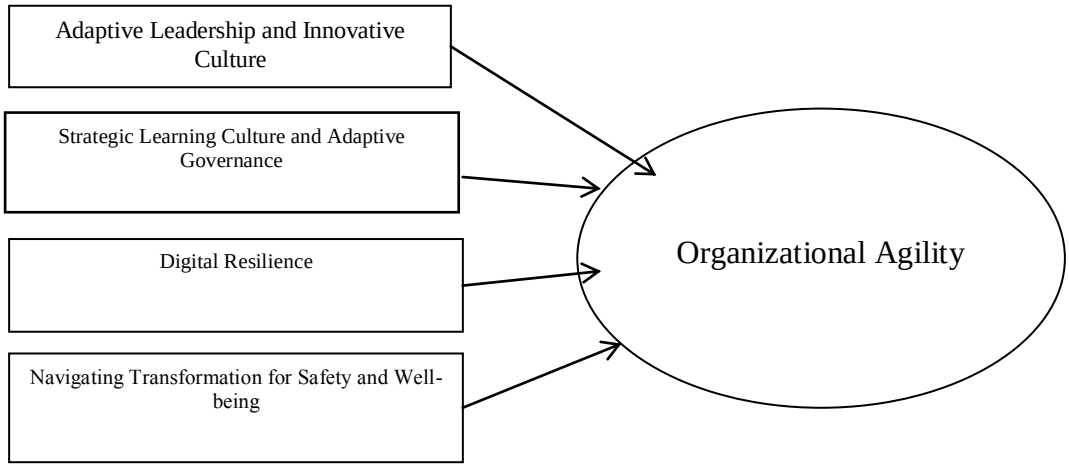
This finding aligns with the expectations set forth by Hoyle (2000) and reinforces the robustness of the model. It suggests that the latent factors, while distinct, are not operating independently or unrelatedly. Instead, they share meaningful connections, contributing to the measurement model's overall coherence and validity in capturing the studied phenomenon's nuanced dimensions, such as organizational agility.

IV. CONCLUSION AND RECOMMENDATION

The study's outcomes highlight key measures of organizational agility, encompassing Adaptive Leadership and Innovative Culture, Strategic Learning Culture and Adaptive Governance, Digital Resilience, and Navigating Transformation for Safety and Well-being. Rigorous content validation, as indicated by the Content Validity Ratio

(CVR), underscores the reliability of the questionnaires employed in this assessment. Furthermore, the Confirmatory Factor Analysis (CFA) reinforces the scale's robustness, affirming the significance of the identified constructs in capturing the essence of organizational agility.

Figure 3
Final path diagram of the latent dimensions that could measure the Organizational Agility



The examination of internal consistency within the questionnaire further strengthens the reliability of the measurement tool, ensuring that the study's findings are grounded in well-validated and internally coherent measures of organizational agility.

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