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**Received:** July 16, 2025 **Revised:** August 8, 2025 **Accepted:** August 20, 2025

**Citation reference :**

Vasayangkura, T., & Sisan, B. (2025). Organizational resilience of secondary schools: a second confirmatory factor analysis. **International Journal of Industrial Education and Technology**, 7 (2), 1-13

 **ABSTRACT**

This study conducted a confirmatory factor analysis (CFA) of organizational resilience in secondary schools, with findings based on empirical data. The sample for this research consisted of 500 participants, including school directors, deputy directors, and heads of the subject groups from secondary schools, selected through multi-stage random sampling process. The research instrument was a 5-point rating scale questionnaire that underwent content validity verification. The item discrimination indices of the questionnaire ranged from .20 to .80, and the reliability analysis, using Cronbach's alpha coefficient, yielded a value of .92. The statistical method used for data analysis was confirmatory factor analysis (CFA). The study results revealed that organizational resilience in secondary schools comprises four main factors: adaptive capacity, strategic planning, agility, and improvisation. The assessment of the model's goodness-of-fit indices yielded the following results: Chi-Square = .54, RMSEA = .000, GFI = .98, CFI = 1.00, NFI = .99, RMR = .015, RFI = .99, IFI = 1.00, and AGFI = .96, indicating that the model demonstrated congruence with empirical data. The factor loadings of the four main components ranged from .77 to .98, while the factor loadings of the indicators ranged from .38 to .71. The Cronbach's alpha, composite reliability, and average variance extracted values obtained are in the range of .857 – .931, .803 – .924, and .505 – .710, respectively. These values indicated good reliability and acceptable convergent validity. Therefore, developing secondary schools into resilient organizations requires a thorough understanding and integration of key factors influencing organizational resilience to establish internal environments that support personnel and enable effective management of educational resources.

**Keywords:** Organizational resilience, Adaptability, Strategic planning, Agility, Improvisation



## I. INTRODUCTION

The COVID-19 pandemic has triggered a global reset, accompanied by natural disasters such as earthquakes, floods, storms, and fires. These challenges extend beyond natural calamities to include crises and other difficult situations. These circumstances have significantly challenged prevailing assumptions about daily life and work practices (Lazarova et al., 2023, p. 1). Therefore, the concept of organizational resilience is highly relevant to the country, as it enables institutions to respond to crises and unforeseen situations, adapt, and recover from challenging events to ensure long-term survival and success. Educational institutions, which serve as close-knit and formative pillars of society, must undergo adaptive changes to effectively manage and deliver education according to set objectives. School administrators are required to manage education within a new way of life that differs from the past. Consequently, they must implement management practices aligned with the new normal, including preparedness for online teaching through appropriate equipment and technology, curriculum design that considers individual student differences, effective school and teacher management to ensure successful learning outcomes, and physical and mental readiness of both teachers and students (Aytaç, 2020, pp. 57-58).

Studies on organizational resilience have been conducted by scholars and researchers across various contexts, predominantly in the medical and business fields. These studies focus on planning for sudden and unexpected changes to enable organizations to recover from natural disasters, crises, and other challenging situations. Such challenges include shortages of educational resources and personnel, technological advancements, curriculum reforms, changes in instructional management, and the dangers of war. The concept of organizational resilience originated from psychological studies examining children's adaptation in families with schizophrenic parents, which found that only 10 percent of children experienced psychological effects, while the remaining 90 percent could maintain normal lives, with some even achieving academic excellence. This became the starting point for researchers' interest in understanding the psychological processes involved in such responses. The term "Resilience" has begun to be used in Thailand, though studies within educational organizational contexts remain limited, as well as its application across different contexts and sample groups. Research has been conducted in various forms including literature reviews, qualitative and quantitative studies, with data collection from samples in public health organizations, higher education institutions, and business organizations. The statistical methods employed include descriptive statistics, exploratory factor analysis, confirmatory factor analysis, and structural equation modeling. Research findings that can be extended in future studies include measuring resilience among healthcare providers in public health organizations, indicating that healthcare service providers are an appropriate group for studying effective resilient behaviors. The concept of organizational resilience is an emerging framework for understanding and addressing contemporary changes and work-related stress. Resilience helps individuals and organizations develop the capacity to design and implement positive adaptive behaviors in response to specific situations, minimizing stress (Mallak, 1998, pp. 148-152). Organizations' resilience benchmarks are integral for providing recommendations for organizations seeking to build resilience and improve business operations (Stephenson, 2010, p. 3), including the development of



organizational resilience capabilities through human resource management strategies (Lengnick-Hall et al., 2011, p. 243).

In increasingly complex and volatile organizational environments, the concept of organizational resilience has become the new normal. Organizational resilience is a complex, multidimensional concept that emerges from the development of organizational capabilities throughout the organizational life cycle (Evenseth, 2022, p. 1). The challenges and obstacles arising from various changes can be transformed into opportunities for organizational development and educational administration to achieve greater efficiency and effectiveness. Among numerous interesting concepts, Organizational resilience is a notable approach where organizations must plan for and react swiftly and positively to current situations. Simultaneously, it involves progressive planning to transform circumstances and create opportunities for efficient operations (Witmer & Mellinger, 2016, p. 255; Denyer, 2017, p. 5; Khan et al., 2019, pp. 1-26). Organizational resilience represents critical communication for crisis resolution in planning, responding to, and recovering from emergency situations. Furthermore, it can serve as a driving force for both competitive advantage and cultural adaptation. Therefore, organizations must thoroughly understand their internal strengths and weaknesses to effectively implement their strategies and make necessary improvements (Lee et al., 2013, p. 29). Moreover, researchers have identified various components of organizational resilience, including adaptability, strategic planning, agility, and improvisation (Stephenson, 2010, pp. 10-15; Lee et al., 2013, pp. 29-41; Lengnick-Hall et al., 2011, pp. 243-255; Madi-Odeh et al., 2023, pp. 440-468). The basic education curriculum for students at different developmental stages emphasizes distinct focal points. At the secondary school level, the curriculum focuses on enabling learners to explore their aptitudes and interests, develop critical, creative, and problem-solving thinking skills, acquire life skills, and utilize technology as a tool for learning. It also aims to cultivate social responsibility, foster a balanced development of knowledge, morality, and values, and provide a foundation for future careers or further education. Consequently, any disruption in the provision of education at the secondary level may adversely affect students' long-term educational outcomes. Based on the identified components of organizational resilience, the researcher applies these elements to enhance the development of both the organization and its personnel, ensuring effective operation and progress in rapidly changing environments. This approach not only enables the organization to respond effectively to challenges but also to move forward with stability and confidence.

Therefore, the researcher is interested in examining the components of organizational resilience in secondary schools to develop a model appropriate for educational institutions. This model would serve as a framework for administrators and management teams to apply or adapt as guidelines for enhancing educational administration quality, amid rapidly changing and potentially severe circumstances that may arise at any moment.



## II. LITERATURE REVIEW

Organizational resilience must necessarily establish objectives or goals for implementation, employing diverse methodological approaches. A primary responsibility of leaders is to help personnel understand the nature of natural disasters, crises, and challenges facing the organization, and to identify appropriate response strategies. Therefore, it is essential for leaders to be knowledgeable about the components of organizational resilience in order to develop frameworks that guide school administrators in considering the factors influencing the resilience of their institutions. This understanding is crucial for effectively developing schools into resilient organizations capable of adapting to all situations and changes. Leaders should implement rigorous management strategies that are both defensive and progressive, applied consistently yet flexibly. Organizational resilience requires continuous effort, as neglecting any single aspect may lead the organization toward disaster (Denyer, 2017, p. 5). From studies of organizational resilience components, scholars and researchers have examined and presented these components from varying perspectives. Based on the component analyses conducted by Stephenson (2010, pp. 10-15), Lee et al. (2013, pp. 29-41), Lengnick-Hall et al. (2011, pp. 243-255), and Madi-Odeh et al. (2023, pp. 440-468), it can be concluded that organizational resilience comprises four essential components: Adaptability, Strategic planning, Agility, and Improvisation.

Adaptability refers to an individual's capacity to manage physical and psychological problems and obstacles in alignment with changing environmental conditions. This includes learning new tasks and work methodologies, maintaining positive interpersonal relationships with others, and utilizing technology proficiently to achieve organizational objectives. It encompasses maintaining an open mind, accepting reality, and viewing situations from multiple perspectives in preparation for unexpected events. Strategic planning refers to the process of analyzing and forecasting the future to establish appropriate approaches for achieving organizational goals. This involves analyzing both internal and external organizational environments to identify strengths, weaknesses, opportunities, and threats. It encompasses the ability to formulate clear vision, mission, objectives, and strategies, accompanied by continuous monitoring and evaluation. Agility refers to an organization's capacity to adapt and respond to changes rapidly and efficiently, employing strategies to enhance personnel work skills and enabling staff to implement new concepts to achieve organizational objectives. Improvisation refers to the process where personnel employ their creativity and specialized skills to manage and solve problems in unexpected situations. This is expressed through immediate responses characterized by flexibility, with the aim of achieving optimal results tailored to each circumstance, all while maintaining organizational protocols. Given the focus on examining the components of organizational resilience, confirmatory factor analysis (CFA) was employed to analyze the relationships between variables and the theoretically derived components, particularly to assess the validity of the model. This involved evaluating the model's goodness-of-fit with empirical data using established fit indices, as well as assessing the model's reliability by examining the construct reliability (CR) of latent variables and the average variance extracted (AVE).



### III. RESEARCH METHODOLOGY

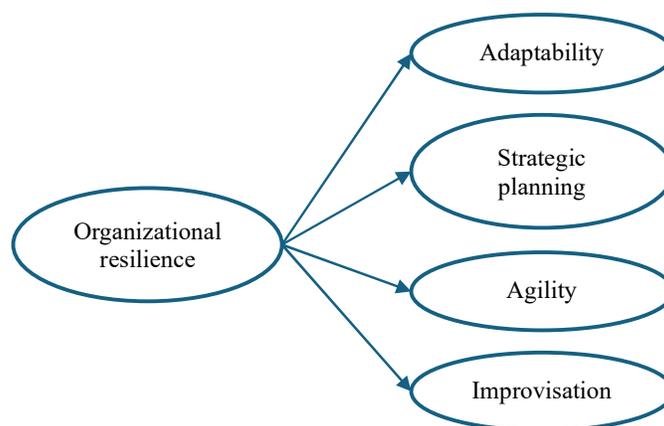
The purpose of this research was to conduct a confirmatory factor analysis (CFA) of organizational resilience in secondary schools.

#### A. Participants

The research sample consisted of 500 participants, including principals, deputy principals, and heads of the subject groups in secondary schools. The sample size was determined according to the criteria established by Tabachnick and Fidell (2012, p. 618), which recommend that a sample size of 500 for confirmatory factor analysis (CFA) is considered excellent. A multi-stage sampling process was employed as follows: 1) A stratified random sampling method was employed by categorizing the sample according to school size, namely small, medium, large, and extra-large secondary schools. The proportion of samples for the study was then determined in alignment with the proportion of each school size. For each selected secondary school, the sample comprised one school director, four deputy directors, and five heads of the subject groups; and 2) simple random sampling was applied to select schools from each size category, resulting in a total sample of 500 participants.

#### B. Variables

The variables are the dimensions of organizational resilience, as shown in Figure 1, and include: 1) Adaptability, 2) Strategic planning, 3) Agility, and 4) Improvisation.



**Figure 1:** The dimensions of organizational resilience

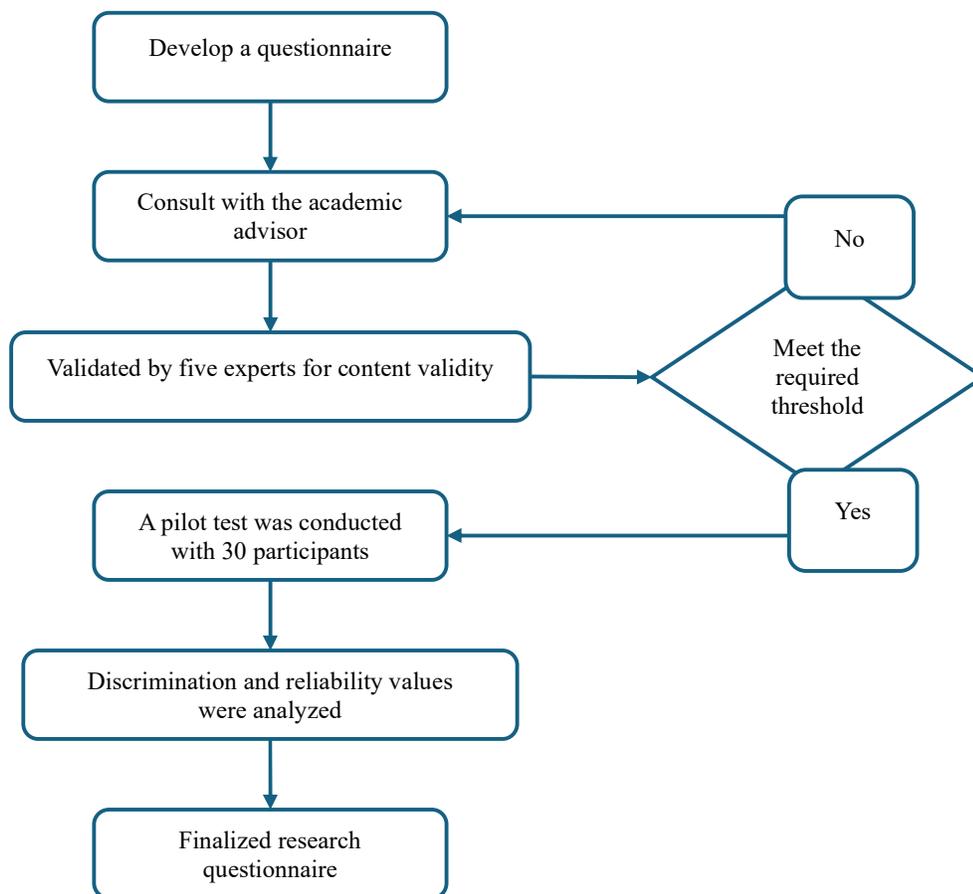
#### C. Research Instrument

This study employed quantitative research methodology to examine perceptions of organizational resilience in secondary schools. The researcher developed a questionnaire based on the conceptual framework derived from a review of the literature, which was subsequently validated by five experts to assess content validity. The results were analyzed to determine the item-objective congruence (IOC) index, with values ranging from .6 to .8 for the questionnaire items used in this research. The questionnaire was then piloted with 30 participants (a try-out group) including school principals, deputy principals, and heads of the subject groups from secondary schools who were not part of the main research sample. The data were analyzed for discriminatory power using Pearson's simple correlation method by calculating the item-total correlation. The analysis revealed discrimination values ranged from .28 to .80, meeting the



established criteria (Ebel, 1976, p. 128). Reliability analysis using Cronbach's alpha coefficient yielded an overall reliability of .92. The reliability coefficients for the individual dimensions were: agility (.66, adaptability (.76, strategic planning (.94, and improvisation (.85

The research questionnaire was administered through an online platform using google forms. The research instrument was a structured questionnaire employing a five-point Likert scale, with response options ranging from 5 (strongly agree) to 1 (strongly disagree). The procedure for constructing a research questionnaire are presented in Figure 2.



**Figure 2:** The procedure for constructing a research questionnaire

#### D. Data Analysis

The researcher analyzed data using statistical software to process the data, calculate means, standard deviations, and perform second-order confirmatory factor analysis to examine the congruence between questionnaire items and objectives. The analysis included evaluation of the Goodness-of-Fit Index according to criteria established by Hair et al. (2010, pp. 639-644).



#### IV. RESULTS

Prior to analysis, the researcher verified preliminary assumptions for analyzing variable relationships, including examination of the Kaiser-Meyer-Olkin measure (KMO) to assess the suitability of the entire dataset for analysis. According to Hair et al. (2010, p. 104), the KMO value should exceed .5. The KMO value obtained from this analysis was .947. Additionally, Bartlett's Test of Sphericity was conducted to examine the overall relationships among variables, which, according to goodness-of-fit criteria, must be statistically significant ( $p$ -value  $< .05$ ), indicating that the variables are sufficiently correlated to proceed with factor analysis.

The examination of the Goodness-of-Fit Index using Confirmatory Factor Analysis (CFA) indicated that the model demonstrated an acceptable fit to the empirical data (Chi-Square = .54, RMSEA = .000, GFI = .98, CFI = 1.00, NFI = .99, RMR = .015, RFI = .99, IFI = 1.00, and AGFI = .96, Sisan, 2017, p. 863), As shown in Table 1, these results indicate congruence of the second-order confirmatory factor analysis measurement model for organizational resilience variables with the empirical data.

**Table 1:** Summary of fit indices

Index name	Index value	Accepted value	Status
Chi-Square	.54	$p \geq .05$	Fit
RMSEA	.000	$< .05$	Fit
GFI	.98	$> .90$	Fit
CFI	1.00	$> .95$	Fit
NFI	.99	$> .95$	Fit
RMR	.015	$< .80$	Fit
RFI	.99	0 – 1	Fit
IFI	1.00	$> .90$	Fit
AGFI	.96	$> .90$	Fit

The results of the data analysis revealed that organizational resilience in secondary schools comprises four main factors: Adaptability (six indicators), Strategic planning (five indicators), Agility (four indicators), and Improvisation (five indicators). The findings from the second-order confirmatory factor analysis of organizational resilience in secondary schools indicate that all factor loadings exceeded the threshold value of .30 (Hair et al., 2010, p. 116). The factor loadings for the four latent constructs ranged from .77 to .98, with corresponding reliability coefficients ranging from .66 to .95." Then, for each factor: "Agility exhibited the highest reliability, with indicator factor loadings ranging from .42 – .53 and corresponding reliability coefficients ranging from .45 – .60. Adaptability showed factor loadings of indicators ranging from .38 – .51, with reliability ranging from .40 – .54. Strategic planning had factor loadings of indicators ranging from .56 – .71, with reliability values ranging from .58 – .90. Improvisation exhibited indicator factor loadings ranging from .51 – .55, with reliability ranging from .58 – .68. The detailed results of the data analysis are presented in Table 2 and Figure 3.



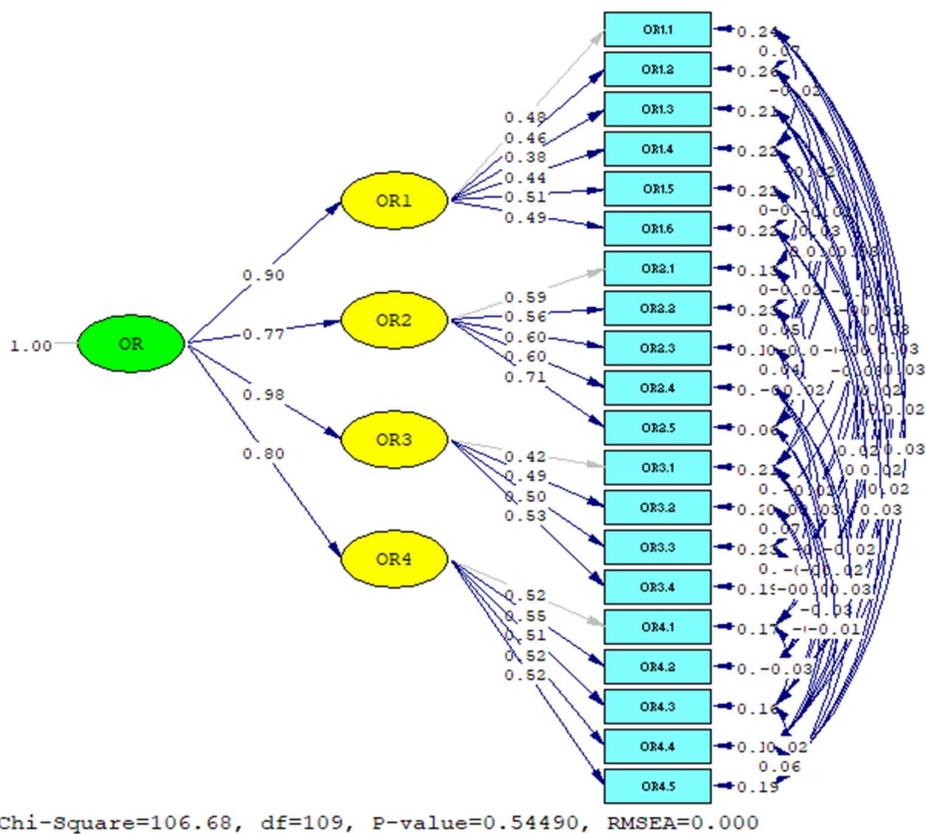
**Table 2:** Result of second confirmatory factor model analysis of organizational resilience of secondary schools

<b>Organizational Resilience (OR)</b>	$\bar{x}$	SD	<b>Factor Loading</b>	<b>Standardize Error</b>	<b>t</b>	<b>R<sup>2</sup></b>
<b>Adaptability (OR1)</b>	<b>4.36</b>	<b>.508</b>	<b>.90</b>	<b>.06</b>	<b>15.28</b>	<b>.81</b>
OR1.1 Personnel are capable of coping with physical and psychological challenges and obstacles.	4.29	.686	.48	-	-	.50
OR1.2 Personnel are able to learn and perform new tasks beyond their assigned responsibilities.	4.36	.687	.46	.03	16.09	.45
OR1.3 Personnel demonstrate good interpersonal relationships with others.	4.52	.592	.38	.03	12.82	.40
OR1.4 Personnel are proficient in utilizing technology effectively.	4.34	.643	.44	.03	13.31	.47
OR1.5 Personnel are open-minded and willing to accept unexpected events or realities.	4.30	.701	.51	.04	14.59	.54
OR1.6 Personnel are able to assess situations from multiple perspectives.	4.35	.676	.49	.03	14.37	.53
<b>Strategic planning (OR2)</b>	<b>4.39</b>	<b>.648</b>	<b>.77</b>	<b>.05</b>	<b>16.55</b>	<b>.60</b>
OR2.1 School administrators establish appropriate directions for the institution.	4.39	.697	.59	-	-	.73
OR2.2 School administrators conduct analyses of strengths, weaknesses, opportunities, and threats (SWOT) in planning for school development.	4.36	.740	.56	.03	21.00	.58
OR2.3 School administrators define a clear vision, mission, goals, and strategic plans.	4.45	.743	.60	.03	18.59	.66
OR2.4 School administrators regularly monitor and evaluate operational performance.	4.41	.731	.60	.03	20.24	.68
OR2.5 School administrators effectively adapt strategies in response to changing circumstances.	4.36	.753	.71	.03	25.25	.90
<b>Agility (OR3)</b>	<b>4.38</b>	<b>.563</b>	<b>.98</b>	<b>.06</b>	<b>15.32</b>	<b>.95</b>
OR3.1 The school is able to adapt to various changes.	4.49	.622	.42	-	-	.45
OR3.2 The school can respond to changes quickly and efficiently.	4.38	.663	.49	.03	18.38	.54
OR3.3 The school utilizes strategies to enhance the work skills of its personnel.	4.33	.690	.50	.03	15.23	.52
OR3.4 Personnel are able to apply new conceptual frameworks to achieve organizational goals.	4.34	.683	.53	.04	14.43	.60



**Table 2:** (Continued) Result of second confirmatory factor model analysis of organizational resilience of secondary schools

Organizational Resilience (OR)	$\bar{x}$	SD	Factor Loading	Standardize Error	t	R <sup>2</sup>
<b>Improvisation (OR4)</b>	<b>4.37</b>	<b>.563</b>	<b>.80</b>	<b>.05</b>	<b>15.65</b>	<b>.64</b>
OR4.1 Personnel are able to apply creative thinking in resolving various situations.	4.36	.667	.52	-	-	.61
OR4.2 Personnel can utilize their unique skills to manage unexpected situations.	4.35	.676	.55	.03	19.00	.68
OR4.3 Personnel demonstrate flexibility in problem-solving.	4.43	.649	.51	.03	16.72	.62
OR4.4 Personnel can effectively resolve issues using intuition.	4.33	.683	.52	.03	17.53	.59
OR4.5 Personnel manage crisis situations while maintaining order within the institution.	4.37	.678	.52	.03	17.21	.58



**Figure 3:** Results of the second confirmatory factor model analysis of secondary schools



The measurement model assessment was conducted through confirmatory factor analysis (CFA), as presented in Table 3. The reliability analysis employed Cronbach's alpha coefficient ( $\alpha$ ), which should exceed .7, composite reliability (CR), which should exceed .6, and average variance extracted (AVE), which should exceed .5 (Hair et al., 2010, p. 91). The Cronbach's alpha values obtained were in the range of .857 – .931, composite reliability (CR) values were in the range of .803 – .924, and average variance extracted (AVE) values were in the range of .505 – .710. This indicated good reliability and acceptable convergence.

**Table 3:** Results of the measurement model

Construct	$\alpha$	CR	AVE
Adaptability (OR1)	.857	.803	.505
Strategic planning (OR2)	.931	.924	.710
Agility (OR3)	.869	.817	.527
Improvisation (OR4)	.896	.869	.623

## V. CONCLUSION AND DISCUSSION

The confirmatory factor analysis model of organizational resilience in secondary schools examined in this research study revealed that organizational resilience comprises four main components: Adaptability, Strategic planning, Agility, and Improvisation. The evaluation of the model's Goodness-of-Fit indices yielded the following results: Chi-Square = .54, RMSEA = .000, GFI = .98, CFI = 1.00, NFI = .99, RMR = .015, RFI = .99, IFI = 1.00, and AGFI = .96, indicating that the model demonstrates congruence with the empirical data. The factor loadings of the four main components ranged from .77 to .98, while the factor loadings of the indicators ranged from .38 to .71. The Cronbach's alpha, CR, and AVE values obtained were in the range of .931 - .857, .924 - .803, and .710 - .505, respectively, demonstrating good reliability and acceptable convergence. Therefore, developing secondary schools into resilient organizations requires a thorough understanding and integration of key factors influencing organizational resilience to establish internal environments that support personnel and enable effective management of educational resources.

The first component, adaptability, aligns with the work of Lengnick-Hall et al. (2011, p. 243), Madi-Odeh et al. (2021, p. 11), Stephenson (2010, p. 174), and Lee et al. (2013, p. 34), which describes the capacity to restore appropriate conditions in response to changing environments. Individual adaptability across various change scenarios is essential for organizations aspiring to achieve professional success. The rationale behind adaptation to change stems from the understanding that personnel experiencing personal difficulties will demonstrate reduced effectiveness, particularly during the initial phases of change when productivity often diminishes significantly. Individuals with strong adaptive capabilities typically exhibit analytical and creative thinking skills, remain receptive to acquiring diverse new knowledge, can organize their cognitive processes to respond effectively to work demands, are prepared to manage risks and consistently experiment with novel approaches, and crucially, can regulate their emotions, maintain optimistic perspectives, and interact harmoniously with others. The second component, strategic planning, corresponds with the work of Stephenson (2010, p. 174), Madi-Odeh et al. (2021, p. 11), and Lee et al. (2013, p. 34). Strategic planning constitutes an effective organizational development process that provides operational guidelines with the capacity for potential development



and adaptability to contemporary organizational changes. Through strategic planning, administrators can investigate problems and evaluate the organization's status, resulting in clearly defined organizational goals and operational directions. This process facilitates alignment and enhances organizational workflow efficiency. Additionally, it helps the organization establish a clear vision that all members can understand and embrace. The third component, agility, aligns with Lengnick-Hall et al. (2011, p. 243), wherein agility refers to organizational nimbleness with primary emphasis on people and internal systems that must operate at speeds commensurate with competitive conditions and environmental changes. Agile organizations can move or advance rapidly (Handscorn et al., 2020, pp. 1-7). The characteristics of agility include the capacity to perform beyond planned parameters, develop personnel skills for future requirements, grant autonomy to organizational members while facilitating collaborative work, establish shared work objectives, implement expeditious decision-making processes, convene meetings only when necessary, and prioritize the creation of practical operational processes rather than documentation-based performance evaluation. The fourth component, improvisation, corresponds with Lengnick-Hall et al. (2011, p. 243), reflecting how organizations have transitioned from traditional personnel management approaches to new methodologies appropriate for rapid change, characterized by swift responsiveness, flexibility, unplanned innovation, and sustainable organizational development, thereby enhancing organizational crisis management capabilities (Altarawneh, 2024, p. 42). This concurs with Alhamdany et al. (2023, p. 399), who identify improvisation as spontaneous and creative action where experienced individuals respond to threats utilizing available resources within constrained timeframes. Improvisation enables organizations to adapt efficiently to changing conditions and events while enhancing flexibility and the capacity to respond effectively and promptly to unexpected situations. Consequently, developing secondary schools into resilient organizations necessitates factors that influence organizational resilience to facilitate appropriate internal secondary school environments regarding both personnel and efficient educational resource management. Therefore, developing secondary schools into resilient organizations necessitates a thorough understanding of the components of organizational resilience and fostering among school personnel the components of adaptability, agility, and improvisation. Possessing these three components enables personnel to respond swiftly and effectively to sudden changes or to any strategic direction pursued by school administrators. Furthermore, administrators must take the lead in strategic planning and actively involve personnel in the planning process to foster a sense of ownership and commitment to their work. Understanding the components of organizational resilience also facilitates the precise identification of factors influencing resilience, which in turn can promote and support the creation of an optimal internal school environment, both in terms of personnel and the effective management of educational resources.



## ACKNOWLEDGEMENT

The researcher expresses profound gratitude to all experts who generously provided assistance in reviewing the research questionnaire and offered valuable suggestions for improving content validity of the questionnaire items, which significantly benefited the data collection process in this research. Furthermore, the researcher extends sincere appreciation to all respondents who cooperated and dedicated their time to completing the questionnaire, enabling the researcher to conduct comprehensive statistical analysis of the data for this research study.

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