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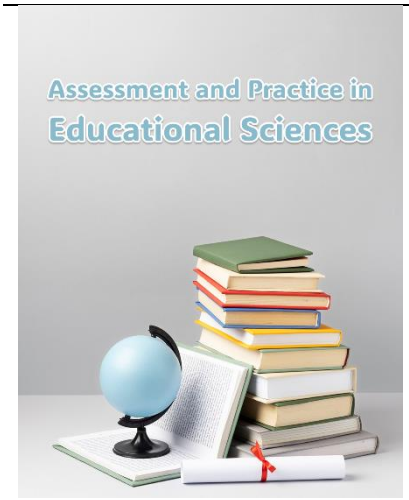

Designing a Resilient Schools Model Based on the Grounded Theory

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ABSTRACT

The present study was conducted with the aim of designing a resilient schools model based on grounded theory. In terms of purpose, this study is applied; in terms of data type, it is mixed of the exploratory type; and in terms of nature and implementation method, it was carried out in two ways: systematic grounded theory and cross-sectional survey. The qualitative section participants consisted of experts, including university professors and senior managers of the Ministry of Education, who were sampled using a purposive approach and the snowball method until theoretical saturation was reached, and interviews were conducted with 14 individuals. The quantitative population consisted of all heads and deputies of the educational districts in Tehran, totaling 622 individuals, of whom, based on the Morgan and Krejcie table, 242 were selected as the sample size through stratified random sampling. Qualitative data were collected in the field using semi-structured interviews, and quantitative data were collected in the field using a researcher-made questionnaire. The validity of the qualitative section instrument was determined using the retest of the work procedure and the inclusion of new interviewees, and reliability was determined using the inter-coder reliability test. The validity of the quantitative instrument was assessed through face and content validity (CVR), and its reliability was measured using Cronbach's alpha coefficient. Qualitative data were analyzed using the theoretical coding method, and quantitative data were analyzed using confirmatory factor analysis. The results indicated that the resilient schools model based on systematic grounded theory includes 22 components and 97 indicators within six dimensions of the paradigm model, as follows: the core phenomenon with three components (flexibility in capital, adaptation to continuous changes, integrated internal and external support) and 10 indicators; causal conditions with three components (resilient characteristics of students and teachers, educational content and curriculum, school leaders) and 21 indicators; contextual conditions with three components (environment, school, family) and 10 indicators; intervening conditions with three components (motivational factors, spiritual factors, organizational factors) and 12 indicators; strategies with seven components (positive communication skills between teacher and student, teaching emotional-social skills, applying cooperative learning strategies, fostering positive emotions, developing students' strengths, creating a sense of meaning and purpose, teaching cognitive skills) and 30 indicators; and consequences with three components (improving school efficiency, student success, enhancing quality of education) and 13 indicators. Ultimately, the validity of the model, its dimensions, components, and indicators obtained in the qualitative stage was confirmed in the quantitative stage, and statistical indices confirmed the fitness of the resilient schools structural model. As a result, policymakers and stakeholders in the education system can, by applying the findings of the present study and planning to remove obstacles, take steps toward creating and strengthening resilient schools, thereby yielding positive results and outcomes for the country's education system and the future builders of society.

Keywords: Resilience, Resilient Schools, Non-Governmental Schools, Secondary School Students.

Introduction

Resilience has emerged as a pivotal construct in educational systems, particularly in the face of global crises, socio-economic pressures, and systemic challenges that directly affect schools and students. In educational contexts, resilience refers to the capacity of individuals, institutions, and systems to anticipate, withstand, adapt to, and recover from adverse situations while

continuing to achieve developmental and learning goals (1, 2). The concept has evolved from being viewed primarily as an individual psychological trait to a multi-layered framework encompassing interpersonal, organizational, and systemic dimensions (3, 4). This shift recognizes that schools, as complex adaptive systems, require resilience not only at the student or teacher level but also in governance structures, policies, and community engagement (5, 6). The necessity for resilience in schools has intensified due to challenges such as the COVID-19 pandemic, environmental disasters, socio-political instability, and economic inequality (7, 8). Studies highlight that schools capable of adapting their structures, maintaining teaching continuity, and safeguarding student well-being during crises tend to demonstrate higher recovery rates and more sustainable outcomes (9, 10). Such resilience involves integrating physical safety, psychosocial support, adaptive teaching strategies, and community partnerships into the school's operational fabric (11, 12).

Resilient schools can be conceptualized through multiple theoretical lenses. The systems perspective views schools as part of larger socio-ecological frameworks where internal capacities interact with external conditions (4, 9). The organizational resilience literature emphasizes adaptive capacity, robust leadership, and the ability to learn from disruptions (13, 14). At the human capital level, resilience theories highlight personal attributes such as self-efficacy, optimism, and emotional regulation among students and teachers (11, 15). In the school context, these levels converge to form a paradigm where resilience is both an outcome and a process shaped by leadership, pedagogy, community involvement, and policy frameworks (6, 16). Grounded theory and qualitative approaches have been instrumental in modeling resilience in educational institutions, offering nuanced insights into the interplay of causal, contextual, and intervening conditions (17, 18). Such models often categorize resilience-building factors into domains such as leadership, curriculum adaptability, family engagement, resource availability, and strategic planning (19, 20). The integration of these domains can enhance schools' capacity to prevent dropouts, mitigate academic decline, and improve psychosocial outcomes in challenging environments (21, 22).

Empirical studies demonstrate that resilience in schools is fostered through both proactive and reactive strategies. Proactive measures include embedding resilience into curricula, training staff in adaptive practices, and developing comprehensive safety and support systems (10, 23). Reactive measures involve rapid adaptation during crises, such as shifting to remote learning, providing targeted psychosocial interventions, and mobilizing community resources (24, 25). Notably, resilience is strengthened when schools operate within supportive policy environments that prioritize flexibility, resource allocation, and stakeholder collaboration (26, 27). Leadership plays a central role in sustaining resilience. Resilient principals and administrators often exhibit transformational leadership behaviors, effective communication, and the ability to foster collective efficacy among staff (6, 28). They create an organizational culture that values adaptability, shared responsibility, and continuous learning (29, 30). Moreover, leadership actions influence teacher motivation, student engagement, and the broader school climate, all of which contribute to resilience outcomes (31, 32).

Scholars often identify multiple interrelated dimensions of resilience in schools. Causal conditions may include student and teacher resilience characteristics, curriculum relevance, and leadership capacity (19, 20). Contextual factors encompass environmental safety, school infrastructure, and family support (17, 25). Intervening conditions such as motivational, spiritual, and organizational elements can either facilitate or hinder resilience (15, 21). Strategies for fostering resilience range from building positive teacher–student relationships to implementing cognitive and emotional skills training (2, 16). Finally, anticipated consequences include improved school performance, enhanced student success, and better quality of education (1, 22). The link between resilience and student well-being is particularly significant. Resilient school environments promote protective factors such as connectedness, supportive peer and teacher relationships, and opportunities for meaningful participation (23, 24). These protective factors mitigate the impact of adverse childhood experiences, socio-economic hardship, and academic pressure (11, 33). Evidence from intervention studies indicates that embedding resilience-building programs

within the school routine enhances not only academic outcomes but also emotional regulation, problem-solving skills, and future aspirations (10, 24).

Organizational resilience research in non-educational sectors offers valuable lessons for schools. Concepts such as flexibility in resource allocation, decentralization of decision-making, and fostering a culture of innovation can be adapted to educational settings (13, 34). In times of crisis, schools that mirror resilient business practices such as scenario planning, stakeholder engagement, and process diversification are better equipped to maintain core functions (35, 36). Additionally, resilience in schools is interconnected with broader community resilience, particularly in regions prone to environmental hazards or political instability (8, 9). Studies from different national contexts reveal both commonalities and context-specific adaptations in resilience strategies. Research in Russia emphasizes policy-driven resilience through centralized support and resource allocation (26), while work in developing countries focuses on grassroots mobilization and multi-sector collaboration (8). In socioeconomically disadvantaged settings, school-based resilience programs have been shown to significantly reduce behavioral problems and improve attendance (7, 10). Conversely, the absence of systemic support can undermine resilience even in schools with strong internal leadership and motivated staff (5, 27).

The integration of resilience into educational policy is gaining momentum globally (5, 27). However, policy documents often contain contradictions or overlook the localized realities of schools (27). There is a need for frameworks that balance universal principles with flexibility for local adaptation (1, 4). Measuring resilience remains a methodological challenge. While qualitative models capture the complexity of resilience processes (17, 18), quantitative approaches allow for broader generalization but may oversimplify nuanced interactions (12, 30). Mixed-method designs are increasingly recommended to bridge these methodological divides (28, 29). Another gap lies in longitudinal research. Much of the existing literature focuses on resilience during or immediately after crises (25, 31), with limited exploration of how resilience evolves over time in stable or post-recovery phases (3, 14). While teacher and student resilience have been extensively studied, less attention has been given to the resilience of administrative structures, support staff, and the broader educational ecosystem (1, 6).

In sum, resilience in schools is a multidimensional construct that integrates individual capabilities, organizational strategies, and systemic support. For non-governmental schools, which may face distinct challenges in resource acquisition, policy support, and community expectations, resilience becomes both a necessity and a competitive advantage (19, 20). By synthesizing insights from educational, organizational, and policy research, the current study aims to design and validate a comprehensive model for resilient schools in the non-governmental education sector.

Methods and Materials

This study is applied in terms of purpose, exploratory mixed-method (qualitative and quantitative) in terms of data type, and, in terms of research implementation method, systematic grounded theory (qualitative stage) and cross-sectional survey (quantitative stage). The statistical population in the qualitative stage consisted of all experts, specialists, and university professors with scientific achievements in the field of resilience, as well as senior managers of the Ministry of Education and experienced school principals and counselors. Sampling in the qualitative stage was carried out using the snowball method until theoretical saturation was reached, such that interviews were conducted with 17 participants, but the final three interviews did not yield any new codes and were therefore excluded from the analysis. The statistical population in the quantitative section included all heads and deputies of the 20 educational districts of Tehran (140 individuals) and principals of non-governmental upper secondary schools in Tehran (482 individuals), totaling 622 individuals. The sample size was determined using the Morgan and Krejcie table, resulting in 242 participants being selected.

In the qualitative section, both library and field methods were used for data collection. First, the library method was applied to examine the theoretical foundations and research background on resilient schools. Then, the field method was used for data collection. A semi-structured interview form was developed, and based on the interview protocol, data were obtained from experts. In the quantitative section, the field method was used for data collection, employing a researcher-made questionnaire developed based on the qualitative findings. This questionnaire included 22 components and 97 indicators and was designed using a seven-point Likert scale. In the qualitative stage, two methods—retesting the work procedure and using new interviewees—were applied to assess the validity of the instrument and data, and the inter-coder reliability test was used to determine reliability. The results of the validation of the findings are presented in Table 1.

Table 1. Results of findings validation using triangulation method

Method	Total Codes	Agreements	Disagreements	Retest Value
Interviewee	63	26	11	82
Work procedure	250	100	34	80
Inter-coder	81	36	16	86

Considering the total number of codes obtained and the frequency of agreements, reliability greater than 60% was achieved (80% for work procedure, 86% for inter-coder, and 82% for new interviewees), confirming the trustworthiness of the coding, and it can be claimed that the obtained reliability level is satisfactory. In the quantitative stage, the Content Validity Ratio (CVR) was used to assess validity, and Cronbach's alpha was used to measure reliability. The results are presented in Table 2.

Table 2. Content validity and reliability values of questionnaire components

Component	CVR	α	Component	CVR	α
Resilient characteristics	0.90	0.839	Integrated support	0.88	0.844
Educational content and curriculum	0.88	0.818	Positive communication skills	0.90	0.830
School leaders	0.90	0.838	Emotional-social skills training	0.90	0.922
Environment	0.90	0.787	Cooperative learning application	0.93	0.919
School	0.78	0.813	Fostering positive emotions	0.91	0.907
Family	0.93	0.751	Developing students' strengths	0.80	0.829
Motivational factors	0.89	0.875	Creating a sense of meaning and purpose	0.87	0.885
Spiritual factors	0.90	0.816	Cognitive skills training	0.90	0.834
Organizational factors	0.79	0.709	Improving school efficiency	0.81	0.876
Flexibility in capital	0.94	0.729	Student success	0.79	0.818
Adaptation to continuous changes	0.73	0.910	Enhancing quality of education	0.84	0.807

The content validity of the questionnaire for each component, based on the Lawshe table, was obtained at a level higher than 0.49, indicating acceptable validity. Furthermore, the reliability of the questionnaire, calculated using Cronbach's alpha, exceeded 0.70 for each component, confirming acceptable reliability.

For qualitative data analysis, theoretical coding (open, axial, and selective) was applied using the systematic grounded theory approach. Data were obtained and analyzed in three coding stages, and the coding process was performed using Maxqda version 24.4. Quantitative data were evaluated using confirmatory factor analysis, and all calculations were carried out with SPSS version 24 and LISREL software.

Findings and Results

Considering the questions posed in the present study, and with the aid of the systematic grounded theory approach, the researcher first conducted data coding and then provided answers to the research questions as follows.

Open Coding: The interviews conducted by the researcher were reviewed multiple times. Segments of the interview transcripts that were deemed key were highlighted, and an initial list of prominent points in the data was prepared. To transform

textual data into usable and understandable data, “paragraphs,” “phrases,” and “words” were utilized. The interview texts were transferred into software, and open codes were identified. In the first step, 203 initial codes were obtained; after merging similar codes and standardizing phrases, the initial codes were reduced to 97 codes. The open codes obtained from the interview transcripts are presented in Table 3. The process of extracting codes from the interview texts is described below, along with selected excerpts from the interviews.

Interviewee No. 1: In my opinion, resilient schools have a unique characteristic that distinguishes them from other schools, and that is the fact that these schools give students, teachers, and everyone involved an inner feeling that “this is your home” and that it is the safest place you can be. This feature is specific to resilient schools. Therefore, when you encounter any issue or stressful problem in such an environment, you are not afraid and you try to resolve it.

Interviewee No. 2: Everything comes back to the school curriculum. It seems that these schools should have a separate curriculum compared to public schools. As I said, they are very different. In many public high schools in Tehran—and even to some extent in middle schools—many students work and earn an income, in all kinds of jobs you can think of, from shop assistants and manual labor to programming work, which I personally know cases of. In a non-governmental school, we should teach students to manage themselves: to work, to earn money, and, when facing a problem, to solve it themselves instead of immediately calling their servant (I mean their parents—though in some cases, the children’s parents act as their servants and take care of everything). The curriculum should teach ethics; it should teach that not everything is about money, not everything is about studying, not everything is about facilities, and that these things are not permanent. We should put students in the difficulty and hardship of doing assignments so that they can strengthen themselves and solve problems on their own, and come to the realization that, like it or not, one day they will be separated from their parents and will have to bear their own responsibilities.

Interviewee No. 7: I said that society, in all its aspects, affects the resilience of schools. For example, when the political situation of the country is influenced by an international or domestic factor, it affects the school’s budget, the economic status of families, and the mental and psychological state of principals and teachers. Many occupations—from services to manufacturing and industrial sectors—are influenced by this factor, and therefore resilience is impacted.

Interviewee No. 10: Both the school and the family provide the groundwork. Of course, the government also plays a macro role. The government’s role is different—it has an effective role in policymaking and determining the goals of the educational system, which strongly affects the resilience of all elements of the school. The facilities it provides to schools, the salaries it pays to teachers, the recruitment process, and the characteristics of teachers are all influenced by the decisions and policies of the government. However, in my view, the family and the school play a greater role.

Interviewee No. 16: The public system—laws and regulations—the monitoring system—the economic status of families—the family culture and, overall, the family—the geographical location of the place of residence—whether it is a city or a village, a small town or a metropolis—the nature of individuals—all of these are very important.

Interviewee No. 1: Our living environment, which includes family members, friends and classmates, and school staff, each play a role in creating school resilience. If we have classmates who are not in good mental, psychological, or even physical condition, interacting with them can cause us to experience mental problems, and whenever an issue arises at school, it can quickly lead to anxiety and stress for us—and vice versa. Similarly, if teachers are good role models for us, we look up to them, and if there is imitation, we try to be like our teachers, which increases students’ resilience.

Axial Coding: At this stage, the open codes (indicators) obtained in Maxqda software were categorized under axial codes (components). The axial coding process continued, and the obtained components were further grouped into more abstract categories called model dimensions. In total, the 97 open codes obtained in the previous stage were placed under 22 components

and 6 dimensions of the paradigm model, and the axial coding process was completed. The codes obtained, including 6 dimensions, 22 components, and 97 indicators, are presented in Table 3.

Table 3. Results of the coding process (open and axial)

Dimensions	Components	Open Codes (Indicators)
Causal	Resilient characteristics of students and teachers	Internal control – Self-esteem – Trust and sense of having a secure base – Ability to cope with stress and pressure – Willingness for growth and self-improvement – Self-efficacy – Setting realistic goals – Openness to change – Ethical orientation – Optimism and hope for the future
	Educational content and curriculum	Accurate execution of tasks specified in the approved curriculum – Valuing physical education, arts, sciences, and vocational subjects in schools – Full implementation of practical course topics to strengthen mental, physical, and motor skills – Teamwork and group work in completing assignments
	School leaders	Forward movement – Rapid response to new and ever-changing realities – Using social skills to progress in times of turbulence – Timely communication with colleagues in stressful situations – Pursuing educational opportunities – Participation in social activities – Identifying opportunities in adverse events
Contextual	Environment	Availability of infrastructural facilities such as roads, lighting, and public transport – Availability of social facilities such as libraries and public health centers – Social security from home to school
	School	Effective teacher–student communication – School's physical environment – Appropriate psychosocial climate – Social support within the school
	Family	Family's psychological climate – Parenting styles – Parents' psychological and emotional support for children – Attention to physical and mental health in the family
Intervening	Motivational factors	Proper management of emotions and feelings – Accurate understanding of the components of the educational system – Acceptance of challenges and turning them into opportunities
	Spiritual factors	Remembering God in performing tasks – Resilient beliefs and convictions – Religious and spiritual beliefs and values – Calming the heart and mind through prayer and supplication
	Organizational factors	Building trust between the principal and the components of the educational system – Optimal utilization of school resources and capabilities – Resilient actions and functions within the educational system – Imposing high expectations and clear requirements for learning outcomes – Regular holding of in-school meetings and supportive systems
Core Phenomenon	Flexibility in capital	Providing meaningful and comprehensive participation in schools – Maintaining calm – Turning stressful situations into learning opportunities
	Adaptation to continuous changes	Identifying and shaping students' resilience levels – Reducing the effects of pressures and stressful experiences – Preventive role against social harm through self-care
	Integrated internal and external support	Strong emphasis on success and continuing education – Preventing student dropout – Close monitoring of the performance of students, parents, and school staff – Having collective goals
Strategies	Positive teacher–student communication skills	Effective and positive interaction – Effective classroom management – Setting clear expectations for lessons – Teacher's independence and enthusiasm – Goal setting and providing an assessable study plan
	Emotional–social skills training	Self-awareness – Self-management – Mindfulness – Social awareness – Communication skills – Responsible decision-making
	Applying cooperative learning strategies	Strengthening teamwork skills – Creating opportunities to practice social skills – Teaching problem-solving through role-play – Creating a positive learning environment that gives students the power of choice
	Fostering positive emotions	Creating a sense of pride and belonging in students – Using respectful behavior and valuing it – Listening to students' voices and considering their views – Individual support and encouragement of students
	Developing students' strengths	Identifying students' abilities, traits, and strengths – Providing more opportunities for academic progress and success – Creating a sense of worth or recognition of strengths
	Creating a sense of meaning and purpose	Giving students opportunities for cooperation and participation – Familiarizing students with the local and global community – Enhancing sense of well-being through purposeful work and activities – Finding meaning in stressful situations
	Cognitive skills training	Having positive cognitive evaluations of situations – Creating cognitive decision-making skills – Teaching problem-oriented thinking and problem-solving – Planning to develop students' minds
Consequences	Improving school efficiency	Acquiring life skills – Creating self-care in students – Achieving work–life balance – Enhancing life satisfaction – Achieving educational goals
	Student success	Ability to manage daily stress – Skills to face difficult situations – Maintaining calm in the face of environmental pressures
	Enhancing quality of education	Preventing the impact of stress on academic performance – Preventing the impact of stress on physical and mental health – Developing creativity and innovation in education – Using environmental opportunities – Increasing academic motivation

Selective Coding: Finally, selective coding was carried out. This coding was conducted through two rounds of the Delphi method by obtaining expert opinions. In the first stage, experts expressed their opinions regarding the content of each code, and in the second stage, they were asked to provide their views on each of the obtained codes. Based on the experts' feedback, the Content Validity Ratio (CVR) was calculated, and the results were presented in Table (2). The results of the coding process through the three stages—open, axial, and selective coding—are presented in Table (4).

Table 4. Results of selective coding in the form of Delphi implementation

Model Dimensions	Components	Number of Indicators	Model Dimensions	Components	Number of Indicators
Causal Conditions	Resilient characteristics of students and teachers	10	Strategies	Positive communication skills between teacher and student	5
	Educational content and curriculum	4		Emotional–social skills training	6
	School leaders	7		Applying cooperative learning strategies	4
Contextual Conditions	Environment	3		Fostering positive emotions	4
	School	4		Developing students' strengths	3
	Family	4		Creating a sense of meaning and purpose	4
Intervening Conditions	Motivational factors	3		Cognitive skills training	4
	Spiritual factors	4	Consequences	Improving school efficiency	5
	Organizational factors	5		Student success	3
Core Phenomenon	Flexibility in capital	3		Enhancing quality of education	5
	Adaptation to continuous changes	3			
	Integrated internal and external support	4			

After completing the coding process using the systematic approach, the data collected through the researcher-made questionnaire were analyzed. First, the Kolmogorov–Smirnov test was conducted to determine the normality of data distribution (K-S = 3.55; df = 241; p = 0.619). Based on this, it was possible to use parametric tests, specifically factor analysis, to analyze the research data.

Next, confirmatory factor analysis (CFA) was used to determine the significance of the relationship between the observed and latent variables. The results showed that the factor loadings and significance coefficients for each dimension were at an acceptable level. The findings indicated that the observed variables could adequately explain the latent variables. Since the factor loading of all observed variables was greater than 0.40, a desirable relationship exists between each observed variable and the latent variables, playing a significant role in their measurement. The significance of the coefficients between observed and latent variables was examined at the 0.05 level, and the results showed that t-values outside the ±1.96 range for all indicators were significant.

Regarding model fit indices, the results are presented in Table (5). After removing covariance errors, the examination of fit indices showed that the model had a good fit. The chi-square to degrees of freedom ratio was less than 3. The Root Mean Square Error of Approximation (RMSEA) was less than 0.08. Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), and other indices were obtained at values above 0.90, confirming the model's dimensions.

Table 5. Goodness-of-fit indices for the dimensions of the resilient schools paradigm model

Model Dimensions	X^2/df	RMSEA	P-value	GFI	AGFI
Causal factors	2.87	0.071	0.000	0.92	0.91
Contextual factors	2.83	0.033	0.000	0.93	0.92
Intervening factors	2.74	0.058	0.000	0.92	0.90
Core phenomenon	2.79	0.035	0.000	0.92	0.91
Strategies	2.97	0.044	0.000	0.92	0.91
Consequences	2.59	0.031	0.000	0.91	0.90

Based on the analyses conducted through both qualitative and quantitative stages, the answers to the research questions are as follows:

What is the resilient schools model in the non-governmental education sector based on grounded theory?

The results of the present study indicate that in the qualitative stage, the resilient schools model included 97 indicators (open codes), 22 components (axial codes), and 6 dimensions. In the quantitative stage, all 97 indicators, 22 components, and 6 dimensions were confirmed by participants, and the model demonstrated a good fit. Considering the crucial role of schools in a society where students spend most of their time, and given that students are influenced by their surroundings—particularly schools and their associated factors—as well as the importance of the upper secondary level, where students face concerns and stress about their future education and careers, addressing the topic of resilient schools is essential. To reduce pressures on students and enhance their mental, psychological, and physical capacity, a structured framework must be designed and implemented. This goal can only be achieved by having a model for resilient schools, provided it is put into practice. In this study, a model with 22 components was developed for resilient schools, and if all its elements are applied and operationalized, it is expected that school resilience will significantly increase, and resilient schools will be realized in the true sense.

What are the dimensions of the resilient schools paradigm model in the non-governmental education sector?

Through the qualitative and quantitative analyses, the resilient schools model in the non-governmental education sector was found and confirmed to include 97 indicators, 22 components, and 6 dimensions, which are:

- Core phenomenon: Three components—flexibility in capital, adaptation to continuous changes, integrated internal and external support (10 indicators).
- Causal factors: Three components—resilient characteristics of students and teachers, educational content and curriculum, school leaders (21 indicators).
- Contextual factors: Three components—environment, school, family (10 indicators).
- Intervening factors: Three components—motivational factors, spiritual factors, organizational factors (12 indicators).
- Strategies: Seven components—positive teacher–student communication skills, emotional–social skills training, applying cooperative learning strategies, fostering positive emotions, developing students' strengths, creating a sense of meaning and purpose, cognitive skills training (30 indicators).
- Consequences: Three components—improving school efficiency, student success, enhancing quality of education (13 indicators).

Does the resilient schools model in the non-governmental education sector have sufficient validity?

The results of data analysis showed that all standard coefficients and significance coefficients for all obtained categories were at an acceptable and appropriate level. This conclusion was derived from the confirmatory factor analysis (CFA), which confirmed that the relationship between indicators and components, as well as between components and dimensions, was greater than 0.40 in the standardized coefficients and greater than ±1.96 in the significance coefficients. Furthermore, the results of CFA and the structural model fit indices demonstrated that the model enjoyed a good and acceptable fit. The chi-square to degrees of freedom ratio was less than 3, the Root Mean Square Error of Approximation (RMSEA) was less than 0.08, and all fit indices were greater than 0.90, indicating the proper fit of the model. Therefore, it can be concluded that the resilient schools model in the non-governmental education sector has a good level of adequacy. Accordingly, the resulting structural model is illustrated in Figure (1).

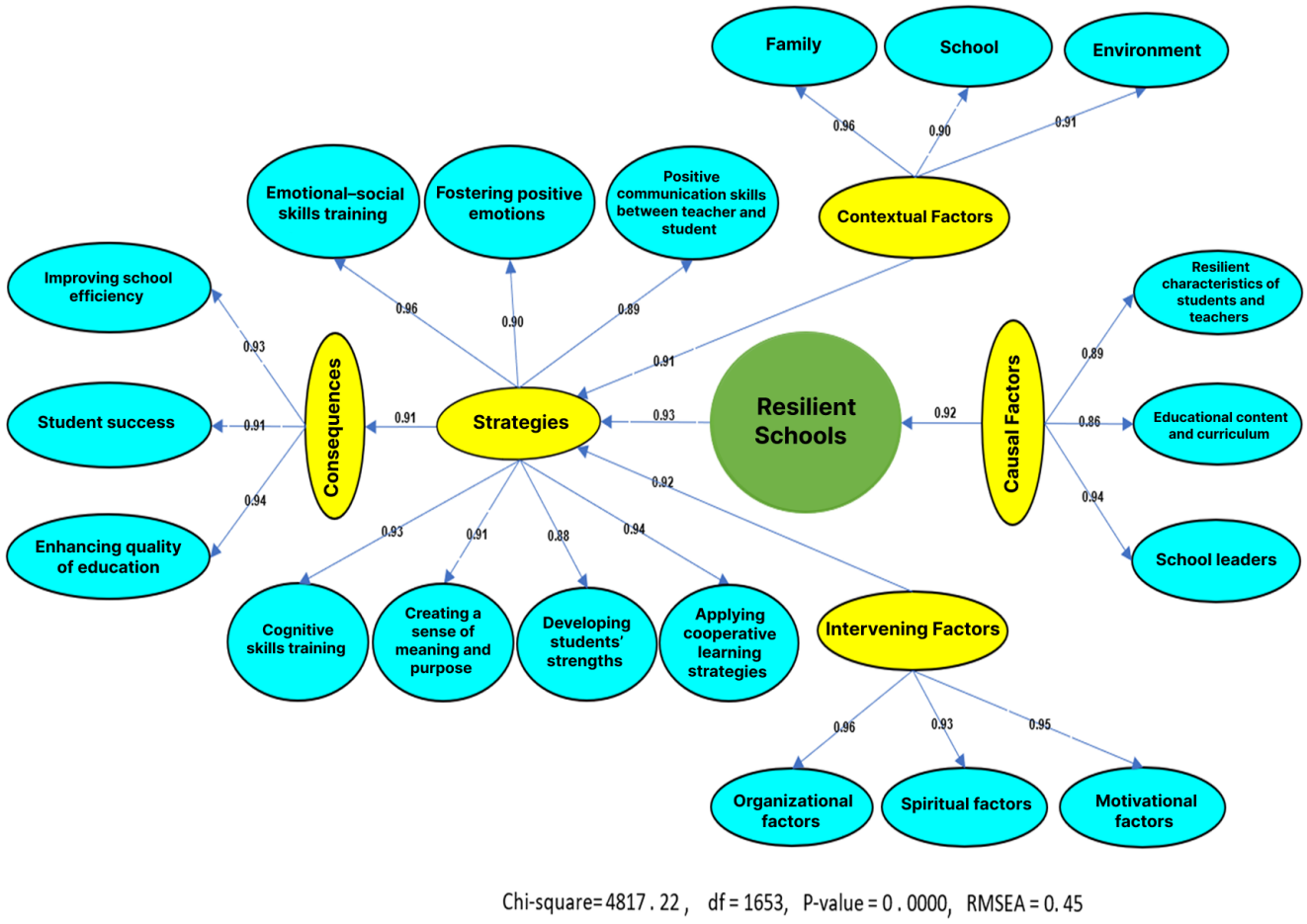

Figure 1. Structural model of resilient schools in the non-governmental education sector

Finally, after analyzing the data and determining the degree of adequacy of the resilient schools model in the non-governmental education sector, the model was drawn. The constituent dimensions of resilient schools, in order based on factor loadings (λ) and t-values, are as follows:

- **Causal factors**: School leaders (λ = 0.94; t = 16.50), resilient characteristics (λ = 0.89; t = 14.49), educational content and curriculum (λ = 0.86; t = 14.12).
- **Contextual factors**: Family (λ = 0.96; t = 14.98), environment (λ = 0.91; t = 14.72), school (λ = 0.90; t = 14.10).
- **Intervening factors**: Organizational factors (λ = 0.96; t = 13.24), motivational factors (λ = 0.95; t = 13.75), spiritual factors (λ = 0.93; t = 13.54).
- **Core phenomenon**: Adaptation to continuous changes (λ = 0.96; t = 14.46), integrated internal and external support (λ = 0.95; t = 11.49), flexibility in capital (λ = 0.93; t = 12.22).
- **Strategies**: Emotional–social skills training (λ = 0.96; t = 14.55), applying cooperative learning strategies (λ = 0.94; t = 16.20), cognitive skills training (λ = 0.93; t = 14.40), creating a sense of meaning and purpose (λ = 0.91; t = 15.16), fostering positive emotions (λ = 0.90; t = 12.77), positive communication skills (λ = 0.89; t = 135.85), developing students' strengths (λ = 0.88; t = 15.13).
- **Consequences**: Enhancing quality of education (λ = 0.94; t = 15.44), improving school efficiency (λ = 0.93; t = 13.91), student success (λ = 0.91; t = 16.97).

Moreover, the structural model fit indices—such as the chi-square to degrees of freedom ratio (2.91), the RMSEA value (0.045), and the Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), and other metrics—were all above 0.90. Based on these modeling results, it can be stated that the model has a relatively good fit with the data. The synthesis and analysis of these coefficients indicate that, in order to have resilient schools, it is first necessary to prepare the conditions required for resilience. Then, events and occurrences that lead to the creation or enhancement of resilient schools should take place. Next, the intervening factors that assist the causal factors in fostering resilience should be identified and strengthened—or, if there are factors hindering the creation and strengthening of resilience, they should be addressed. Subsequently, operational strategies can be implemented through the development of coherent and organized programs. Only under such conditions can resilience in schools and the establishment of resilient schools be expected.

Discussion and Conclusion

The results of this study led to the development and validation of a comprehensive paradigm model for resilient schools in the non-governmental education sector, which encompasses six dimensions, twenty-two components, and ninety-seven indicators. The confirmatory factor analysis demonstrated that all factor loadings exceeded the minimum acceptable threshold of 0.40, with t-values outside the ±1.96 range, indicating that the observed variables reliably explained their respective latent constructs. Fit indices further confirmed the robustness of the model, with χ^2/df ratios below 3, RMSEA values below 0.08, and GFI and AGFI scores exceeding 0.90. These findings provide strong empirical support for the adequacy and generalizability of the proposed model, highlighting its potential as a practical framework for strengthening resilience in schools operating outside the public education system.

One of the most significant findings is the central role of the core phenomenon dimension, which includes flexibility in capital, adaptation to continuous changes, and integrated internal and external support. These elements are consistent with the conceptualizations of school resilience as a dynamic and adaptive capacity that enables institutions to respond to disruptions without compromising their educational mission (4, 6). The high factor loadings for adaptation to continuous changes and integrated support underscore the importance of agility and collaborative networks in maintaining operational stability under adverse conditions (7, 9). This aligns with previous research emphasizing that resilient schools proactively build connections with families, communities, and local authorities to ensure coordinated responses during crises (8, 26).

The causal conditions dimension—comprising resilient characteristics of students and teachers, educational content and curriculum, and school leadership—also exhibited strong explanatory power. The prominence of school leadership as a key driver mirrors earlier findings that effective leaders are pivotal in fostering collective efficacy, guiding adaptive instructional practices, and promoting a culture of resilience (6, 28, 29). Moreover, the inclusion of curriculum adaptability resonates with studies showing that flexible, relevant, and skills-oriented curricula enhance both academic resilience and psychosocial well-being (2, 10). The resilience traits identified for students and teachers—such as self-efficacy, optimism, and emotional regulation—are well-documented protective factors in the literature (11, 15).

The contextual conditions dimension, which integrates the environment, school infrastructure, and family support, reflects the systemic perspective that resilience is influenced by ecological factors at multiple levels (4, 17). The strong loading of the family component corroborates prior research demonstrating that parental involvement, emotional support, and consistent communication significantly buffer students from the negative effects of stress (21, 23). Similarly, the environmental component—encompassing safety, accessibility, and resource availability—is consistent with the findings of (9) and (25), which suggest that physical and social infrastructure are foundational to sustaining school functions during disruptions. The

role of the school climate, particularly supportive teacher–student relationships, echoes evidence that positive interpersonal environments enhance students' coping mechanisms and engagement (16, 32).

The intervening conditions dimension—including motivational, spiritual, and organizational factors—illustrates the mechanisms that facilitate or hinder the translation of resilience capacities into practice. The motivational factors identified, such as emotional management and constructive challenge acceptance, are in line with the motivational resilience framework, which links engagement and persistence to adaptive coping strategies (2). The significance of spiritual factors in the model is consistent with findings in culturally diverse contexts where faith-based beliefs provide meaning-making and emotional stability during crises (15, 31). Organizational factors, including trust-building and clear communication within the educational system, echo organizational resilience research, which underscores internal cohesion and role clarity as prerequisites for coordinated action (13, 30).

The strategies dimension, with its seven components—positive teacher–student communication skills, emotional–social skills training, cooperative learning, fostering positive emotions, developing student strengths, creating meaning and purpose, and cognitive skills training—represents the actionable core of the model. These strategies closely mirror evidence-based interventions found effective in prior studies. For example, cooperative learning approaches have been shown to promote social competencies and collaborative problem-solving (10, 24), while emotional–social skills training enhances self-regulation, empathy, and resilience (16, 22). The emphasis on fostering positive emotions and developing students' strengths reflects a strengths-based educational philosophy, which studies have linked to higher motivation and academic achievement (21, 23). Cognitive skills training, including decision-making and problem-solving, is similarly validated by resilience-building frameworks in both educational and organizational contexts (2, 34).

Finally, the consequences dimension—improved school efficiency, student success, and enhanced quality of education—aligns with both theoretical expectations and empirical findings in the resilience literature. Improved efficiency reflects better use of resources, reduced absenteeism, and more effective teaching practices (1, 26). Student success, in terms of academic performance, adaptability, and emotional well-being, parallels outcomes reported in intervention studies (7, 24). The enhancement of educational quality resonates with systemic resilience models that emphasize long-term institutional improvement as a byproduct of adaptive practices (4, 5).

Overall, the alignment between the current study's findings and the extant literature reinforces the validity of the proposed model. The integration of leadership, curriculum adaptability, environmental and family contexts, intervening motivational and spiritual supports, and a diverse set of actionable strategies ensures that resilience is approached holistically. This is consistent with multi-level resilience models that view schools as embedded within wider socio-ecological systems (4, 9). Moreover, the application of both qualitative and quantitative analyses addresses the methodological challenges noted in previous research, offering a robust framework for both theoretical advancement and practical implementation (12, 17).

This study is not without limitations. The sample was drawn exclusively from non-governmental schools in a single metropolitan area, which may limit the generalizability of the findings to other educational contexts, such as rural schools or public institutions. The reliance on self-reported data in the quantitative phase could introduce response bias, particularly in socially desirable domains such as leadership effectiveness and family engagement. Furthermore, while the model integrates multiple dimensions of resilience, it may not fully capture all contextual variables influencing resilience in diverse socio-economic and cultural environments. The cross-sectional design also limits the ability to infer causal relationships between the identified components and school resilience outcomes.

Future research could expand the geographic and institutional scope of the study to include public schools, rural areas, and different cultural contexts, enabling comparative analysis and broader generalizability. Longitudinal studies are recommended

to track the development of resilience over time, particularly through periods of stability and post-crisis recovery, to capture dynamic changes in resilience capacity. Additionally, experimental or quasi-experimental designs could be employed to assess the causal impact of specific resilience-building strategies identified in this model. Further exploration of underrepresented dimensions, such as the role of digital technology integration, cross-sector partnerships, and student agency in resilience processes, would also be valuable.

Educational policymakers and school leaders in the non-governmental sector can use the validated model as a blueprint for designing targeted resilience-building initiatives. Prioritizing leadership development, curriculum flexibility, and stakeholder collaboration will likely yield significant benefits. Schools should invest in teacher professional development focused on emotional–social skills, cooperative learning methods, and student strengths-based approaches. Building robust connections with families and communities, alongside maintaining a supportive and safe school environment, will further enhance resilience capacity. Finally, integrating continuous monitoring and evaluation mechanisms will ensure that resilience strategies remain effective and adaptable in the face of evolving challenges.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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