

Developing and Validating Leadership Resilience Metrics for School Principals: Evidence from Expert Focus Group Discussions

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Abstract

Since the beginning of 2020, the appearance of COVID-19 has gradually been becoming a global pandemic. We have seen one of its impacts on schools, teachers, and students worldwide. Principals must be equipped with resilient leadership to cope with the school crisis; however, due to the need for a tool for measuring principals' leadership resilience. Therefore, this study aims to establish metrics for the leadership resilience of principals. The method employed in the study is the focus group. Conclusions include: 1. leadership resilience with three levels should be included in the evaluation of school performance; 2. leadership resilience should be included in principal training and professional development courses; 3. self-assessment of the principal's leadership resilience should be carried out to facilitate the development of individualized principal resilience courses; 4. the Principal's Leadership Resilience Indicators should be applied as the basis for future school organizational resilience development. Based on the findings, the study recommends including leadership resilience in evaluating school performance in principal training, self-assessment of principal's resilience, and using leadership resilience metrics as the basis for school organizational resilience development. Three dimensions of principal leadership resilience are identified: Resilient Thinking, Resilient Empowerment, and Resilience Behavior. Six implications for principals' leadership are derived from the metrics for leadership resilience.

Keywords: principal; leadership resilience; metrics

I. Research Background and Purpose

Background

This global public health crisis and its economic consequences have led to a sharp rise in interest in exploring the concept of resilience (Vera, Samba, Kong, & Maldonado, 2020). The literature shows that there is a direct relationship between leadership resilience, school effectiveness, and student success (Ackerman & Maslin-Ostrowski, 2002; Cash, 2001; Copland, 2001; Greene, 2003; Greene, 2002; Heifetz & Linsky, 2004; Henderson & Milstein, 2003; Ledesma, 2012; Patterson, Patterson, & Collins, 2002). School leaders need emotional and academic intelligence (Allen, 2009; Harris, 2007; Steward, 2014 West-Burnham, 2009). Besides, there is a strong correlation between school goals, resilience-building factors, and educational change (Henderson & Milstein, 2003). In addition, there are correlations between resilience, leadership styles, professional development, and teacher effectiveness (Morrison & Allen, 2007).

Recently, the term resilience has developed into an essential academic concept and has begun to be used in research in educational administration, such as Geocoris (2004), who applied resilience theory to the ability of principals to survive and become strong in difficult situations. Isaacs (2003) used resilience theory to determine the relationship between high school principals' resilient leadership to strengthening principals' leadership. Goldstein (2003) studied principals' perceptions of their effectiveness and resilience; Nishikawa's (2006)'s research explores the internal and external factors in enhancing the resilient leadership of primary school principals, and the findings show several organizational characteristics that contribute to the resilient leadership of primary school principals. Schaid (2005) studies resilience and applies it to explore principals' effects and motivational effects. From the above, research on resilient leadership is getting more and more attention in education administration.

The ravages of the epidemic have had a considerable impact on teachers and students of the school. The epidemic has impacted the physical and mental impact of the school's teachers and students. Whether the principal can play a resilient leadership to lead the school through the crisis has become increasingly important. Educational leaders enhance resilience perspectives by enhancing teacher autonomy, a sense of purpose, social competence, problem-solving, and achievement motivation (Morrison & Allen, 2007). Resilience development helps teachers integrate, reinforce learning, and collaborate (Seligman, 2009; Truebridge, 2014). However, what is the actual situation of the principal's resilience and leadership to lead the school through this crisis? There needs to be more research on the measurement indicators of principals' resilient leadership.

In particular, there has yet to be a systematic study of the principals' resilience leadership measurement indicators in Taiwan with a direct application of theoretical models. Therefore, based on cross-disciplinary related theories and research on resilient leadership, this study develops a

measuring tool for the principals' resilience leadership.

Purpose

This research aims to construct a measure of resilience leadership for Taiwanese principals and to conduct an integrated analysis based on applying cross-disciplinary related theories and research. Establish a framework and research model to expand the topics and scope of research on presidential leadership in Taiwan to enhance the international theoretical and practical results of presidential leadership.

II. Literature Review

The meaning of the principal's leadership resilience

The research on resilient leadership originates from many academic fields. For example, in psychology, resilience is defined as the ability to recover and withstand hardship through self-healing (Higgins, 1994; Wolin & Wolin, 1993). In human development, resilience is the ability to withstand or successfully face adversity (Werner & Smith, 2001). In change management, resilience is seen as the ability to demonstrate strength and flexibility in the change process with minimal dysfunctional behavior (Conner, 1993). In medicine, resilience is the ability to recognize pain, acknowledge its purpose, and endure pain for some time until it returns to normal (Flach, 1988; O'Leary & Ickovics, 1995). In the field of nursing, it is the ability to regenerate forces in response to internal or external environmental pressures in order to survive, grow or develop (Jones, 1991). In the social sciences, resilience is often defined as the ability to recover from adverse life experiences and become stronger while overcoming them (Henderson & Milstein, 1996). Resilience has undergone constant shifts in research across different academic fields. Because of this evolving situation, resilience has multiple definitions (Janet, 2014; Turk & Wolfe, 2019). Resilience is coping with adversity, setbacks, and trauma and then recovering to complete life (Kohlrieser, 2014). Resilience is defined as perseverance in the face of adversity, holding on to hope against adversity, optimism, courage, inherent resourcefulness, Demonstrating the ability to recover quickly from setbacks, and possessing moral awareness (Steward, 2014). There is also resilience as the ability to demonstrate through stressful and traumatic events while maintaining one's ability after the fact (Badger, 2019).

Resilience is an individual and collective trait. The concept of resilience has been used in organizational research to refer to the ability of individuals and organizations to cope with adversity when people can withstand or recover quickly from difficult or challenging situations, demonstrating resilience (Hatler & Sturgeon, 2013). Extensive literature includes coping strategies and influencing factors such as external support, intrinsic strengths, and interpersonal and problem-solving skills, which are resources individuals need to assess and cope with adversity (Vera, Samba, Kong, & Maldonado, 2020). Hatler & Sturgeon (2013) argue that resilience exists

within the individual, workplace culture, and the organization. Rather than simply making the environment change, resilient leaders find creative ways to make it workable.

Resilient leadership or leadership resilience can be defined as leaders who can retain their energy under pressure, cope with disruptive change and adapt. Resilience is an essential trait of influential leaders. Leaders must develop resilience on their own to progress and thrive and have the responsibility and energy to perform to help and protect team members (Kohlrieser, 2014). Resilient leaders manage themselves and their emotions appropriately in the workplace. Additionally, they interpret the emotions of others to lead subordinates effectively (Jackson & Daly, 2011). Resilient leaders can be defined as leaders who demonstrate a mature ability to recover, learn, and develop in the face of prolonged or crisis adversity (Reed & Blaine, 2015). Resilience does not fluctuate daily or weekly.

Conversely, resilience reflects how leaders view current realities and assess future resilience (Reed & Blaine, 2015). Patterson and Kelleher (2005) identified personal effectiveness as one of the three key factors supporting school leaders' resilience. They concluded that the six significant advantages of resilient school leaders are as follows: They (1) can accurately assess past and current realities (2) have a positive outlook on the future; (3) know what values are most important; (4) maintain a strong sense of personal efficacy; (5) invest their energy wisely; (6) they use their personal beliefs and dare to act.

Based on the above, this study defines the leadership resilience of a principal as the principal's ability to demonstrate maturity in recovery, learning, and development in the face of chronic stress or crisis adversity, the ability to manage the self and personal emotions in school, and understand the emotions of school personnel, and to lead effectively, and to demonstrate effective leadership.

The theoretical model of principals' resilient leadership

According to the relevant literature, there are some models of resilience in leadership: the first is the resilience leadership compensation model. Compensation models view resilience as a factor that neutralizes risk openings. Risk and compensatory factors independently work together to contribute to the prediction of outcomes. Compensatory factors include optimism, empathy, insight, intelligence, self-esteem, direction or mission, determination, and perseverance (Kumpfer & Hopkins, 1993). The second is the resilience leadership challenge model. Challenge mode shows that if the risk factor is not too high, it can enhance a person's ability to adapt. The experience prepares the individual for the next challenge (O'Leary, 1998). The third model is the protective factor model of resilient leadership. This model derives from the developing literature and systems theory showing that these protective factors promote positive outcomes and healthy personality traits despite favorable or unfavorable living circumstances. Apparent protective factors include

emotional management, internal reflection, academic and work, self-recovery, planning, life, and problem-solving skills (Ungar, 2004). Protective factors come from three primary sources: personal relationships, social interactions, and the unique environment (Werner & Smith, 1992). Examples of personal protective factors include high self-identity and achievement motivation; protective factors of social interactions, including feeling supported and mentored by friends (Mandleco & Peery, 2000); protective factors of the environment, including having a close community and family relationships (Luthar, Cicchetti, & Becker, 2000). The fourth is the organizational resilience-thinking leadership model (Duman, 2017). The Resilient Mindset Leadership Model (RTLTM) integrates relational leadership, conscious thinking, and resilience thinking.

Therefore, RTLTM defines structure as the co-constructing relationship behaviors between individuals and groups that promote systemic behavior through the conscious organization. The fifth is the leadership resilience cycle model. Patterson and colleagues have applied the concept of resilience to educational leadership research over the past decade and used it to describe and study the resilience of leaders (Reed & Blaine, 2015). The sixth is the Inter-relations affecting the emotional resilience model. At its simplest, emotional resilience refers to maintaining emotional connections without being overwhelmed. It takes energy to maintain or stop this activity. However, energy alone is not enough: it has to be guided with purpose, so there needs to be a mechanism for making choices and maintaining this mechanism without kinetic energy (Steward, 2014). This model emphasizes the influence of the environment, and it is necessary to study the environmental background of the principal in order to understand the principal's situation.

Based on the above, it is possible to explore the principal's resilience leadership and its direct impact on the schools they lead using the resilience structure to research school principals. Principals with resilient leadership may be closely related to school personnel and organizational resilience. A more comprehensive understanding of how organizational resilience can be promoted in schools is needed. Exploring the principal's frame of reference, self-ability, se resources, core psychological needs, and perception and memory systems will help to understand how principals can adapt to the school's difficulties and difficulties by sharing stories and increasing their resilience experiences.

Relevant research and findings on the resilient leadership of principals

Some research papers on leadership resilience in principals have been published so far as follows: The first is the study of Janet (2014). The study is to discuss the conceptual framework and research model of resilience theory, explore resilience structures related to leadership development, the history of resilience theory, resilience models, variables of resilience, occupational resilience, and organizational resilience. The literature shows a direct relationship between a leader's job stress and his ability to remain resilient during prolonged exposure to adversity (Janet, 2014). This research explores resilience theory as it relates to leadership development. Concepts related to

resilience, including prosperity and resilience, were explored in this study, believing that resilient leaders are critical to an organization's sustainability.

The second is the study of Steward (2014). By conducting semi-structured interviews with six principals, the study provides insight into the complex relationships that underlie the emotional resilience of school leaders. Greater emphasis on fostering emotional resilience in leadership development programs; Use techniques such as meditation, mindfulness, or awareness, when appropriate, to learn to be optimistic. Continue to enhance the coaching of principals to provide a professional, non-critical, trusting environment for understanding the emotional resilience of the principal so that it can be maintained during times of most significant risk.

The third is the study by Turk & Wolfe (2019). This case study points out that principals face many workplace pressures. Because of these pressures, principals must identify and strengthen their emotional intelligence, resilience, and empathic leadership. This qualitative study aimed to examine principals' self-perceptions of the relationship between emotional intelligence and resilience and how these concepts can be used to initiate, employ and sustain empathic leadership throughout their careers. Based on participants' years of experience, this study showed that principals demonstrated different emotional intelligence skills and resilience to mobilize, use and maintain empathic leadership.

From the abovementioned research, it is found that the number of research on the resilient leadership of principals in Taiwan is minimal; there still needs to be more research.

III. Research Method and Implementation Procedure

The study uses the focus group method to develop metrics for measuring the resilient leadership of principals. The purpose of the focus group approach is to develop the Principal's Resilient Leadership Metrics (see Figure 1 and Table 1).

Research framework

The study is based on establishing the measure of resilient leadership of principals, referring to the above Duman (2017). Innovative Leadership Institute (2020); Näswall, Kuntz & Malinen (2015); Reed (2018); Reed & Blaine (2015); Resilient Leadership (2020) to develop initial metrics of principals' resilient leadership. There are three dimensions of the Metrics for the Leadership Resilience of Principals (See Figure 2).

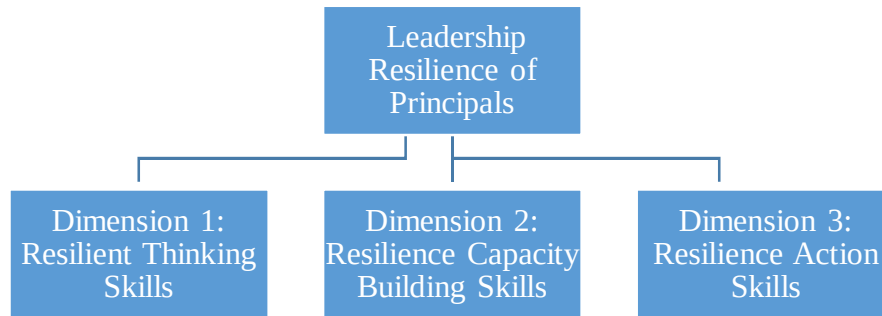


Figure 1 Conceptual Framework of the Metrics for Leadership Resilience of Principals

Each dimension has indicators as the followings:

Dimension 1: Resilient Thinking Skills are made up of twelve indicators below:

- 1-1 The principal will try to understand the reality of the school from multiple perspectives and take relevant measures.
- 1-2 In facing adversity and crisis, the principal will use the positive side to resist the opposing side.
- 1-3 The principal will not change how he/she leads and works to please others.
- 1-4 When someone disagrees with the principal, even when confronted, She/he will continue to strive for communication rather than denying any further dialogue.
- 1-5 Able to maintain neutrality when the principal is under pressure.
- 1-6 Principals share ideas even when resistance or ridicule is expected.
- 1-7 The principal will act in the team's best long-term interests, even at a painful cost.
- 1-8 When the principal encounters resistance or impediment in leadership, it does not turn into a personal grudge.
- 1-9 When it comes time to decide on an issue alone, the principal follows belief.
- 1-10 The principal points out those persons most to make the relevant decisions, not their positions.
- 1-11 When a crisis or long-term adversity strikes, principals remain vigilant and focus their energies on future opportunities rather than obstacles.
- 1-12 The principal emphasizes the value of expertise over the position.

Dimension 2: Resilience Capacity Building Skills comprise the fourteenth indicators below:

- 2-1 Principals can successfully manage the high burden of long-term school leadership.
- 2-2 The principal encourages every colleague to participate in problem-solving.
- 2-3 Principals allow a high degree of autonomy for staff decision-making.
- 2-4 Principals discuss mistakes with staff so everyone can learn from them.
- 2-5 Principals can address crises at work on campus.
- 2-6 Principals learn from mistakes in administrative work and improve work.
- 2-7 Principals reassess their job performance and continually seek to improve.
- 2-8 Work support is sought when principals need specific resources.
- 2-9 The principal uses job change to make it an opportunity for professional peer growth.
- 2-10 Those led by the principal know the principal's vision for the team/organization.
- 2-11 When the principal has a problem with someone, I talk directly to him about things.
- 2-12 Principals only take other people's jobs.
- 2-13 In a crisis, a principal knows what to do to demonstrate confidence, competence, and leadership.
- 2-14 The principal finds colleagues he can trust to speak frankly about his doubts and fears.

Dimension 3: Resilience Action Skills include twelve indicators:

- 3-1 Principals can effectively collaborate with school colleagues to deal with unexpected challenges in educational work.
- 3-2 The principal responds effectively to work feedback, even criticism.
- 3-3 When administrative staff support is required, the principal works with them.
- 3-4 The principal will provide directions to control the situation.
- 3-5 Principals do not back down when workplace relations get strained.
- 3-6 When the principal encounters conflict with colleagues, steps are taken to reduce tension.

3-7 Principals use humor to defuse tense situations.

3-8 The principal will only provide the information needed for personnel needs.

3-9 Work with people to develop problem-solving strategies.

3-10 When a person or situation stimulates the principal, the principal can calm himself down before responding.

3-11 When the principal is on the educational scene, he will be open and accessible to his colleagues.

3-12 The principal knows what leadership actions to take to align with what is most important to the principal among the values while facing a backlash with equanimity.

Focus group

The expansion and application of focus groups are mainly due to the ability to collect qualitative data and its broad applicability (Krueger & Casey, 2000). It has already been pointed out that focus group methods are one of the best methods for collecting qualitative information. Morgan (1998) has pointed out that there are three main types of use of focus groups: (1) a stand-alone research method in which research data is taken entirely from focus groups; (2) ancillary methods used in conjunction with quantitative research; (3) a study one of the many ways to do it. This study used the focus group method as the research method. According to Krueger (1998), Krueger and Casey (2000), the questions discussed in focus groups should conform to the following principles: (1) the questions can be understood by the participants; (2) the questions are concise; (3) the questions are related to everyday language (4) Questions are easy to read publicly; (5) Questions should be open-ended; (6) Each question is specific to one issue; (7) Examples should be carefully given to avoid misleading; (8) Avoid asking "Why?" If it is vital, ask "Why?" instead to gain insight; (9) Questions should be designed with clarity and completeness so participants can straightforwardly answer them.

The number of focus groups is related to the research purpose and conditions. Morgan (1998) suggested that the number should be between 6 and 10, but according to Merton, Fiske, and Kendall (1990), 8 to 12 is ideal. Fern (1982) argues that the ideal number of focus groups is 5 to 12. Therefore, there is no definite principle regarding a focus group's ideal number of juridical members. The actual number depends on the purpose, type, and amount of data collected. Fern's (1982) study showed that the opinion quality of focus groups participated by 4 participants was less than that of 8 participants. However, Morgan (1998) pointed out that if the number of people is too large, it is easier to grasp and will limit the opportunities for participants to provide opinions. Based on the above considerations, this research focus group invited six scholars and experts to

participate (See Table 1 for the details).

Table 1 Participants of Focus Group

No.	Name and associated position
1	Professor, Department of Education, Pingtung University
2	Director, Executive Yuan Southern Office
3	Chairman, Fuying University of Science and Technology
4	Director, Taichung City Education Bureau
5	Professor, Taipei City University
6	Research fellow, National Academy for Educational Research

The focus issues of the focus group method include the following:

1. Are the three dimensions (resilient thinking skills, resilience capacity building, and resilience action skills) of the proposed measure of resilience leadership for principals appropriate? What do you think about the three dimensions? Any advice for each dimension? Or have suggestions for adding layers?
2. What are your views and suggestions on the definitions and connotations of the three dimensions (resilient thinking skills, resilience capacity building, and resilience action skills) of the proposed measure of resilience leadership for principals?
3. On the title item of the proposed Principal's Resilient Leadership Measurement Indicators?
4. Are the items under the three dimensions (resilient thinking skills, resilience capacity building, and resilience action skills) of the proposed principal resilience leadership measure consistent with each dimension's connotations? Give opinions and suggestions.
5. Overall, what are your views and suggestions on the proposed measure of resilience leadership for principals?

Qualitative research data obtained due to focus groups has limitations in inferential interpretation. There is interactive nature of the individual in the process. The focus of participation is according to their will, not anonymous. In addition to the lack of anonymity, the timing of the implementation of focus group laws is one of the limiting factors (Merriam, 2009). In addition, intra-participant views and values may be another study limitation. Due to the interpersonal nature of the engagement process and the emotional nature of the research topic, the researcher's knowledge limitations may also exhibit self-report bias. There may also be limitations due to researchers' existing knowledge of resilient leadership, affecting the internal validity of the results.

Based on the above, to reduce such limitations, this research pays special attention to the biases and assumptions it may hold and discuss with relevant scholars to ensure that these biases will not affect the group discussion data collection and analysis process.

The primary purpose of this research is to study the indicators of resilience and leadership of principals in Taiwan and to conduct an integrated analysis based on relevant theories and research. The topics and scope of Taiwan Presidential Leadership

Result and Discussion

Suggestions on the metrics for the Leadership resilience of principals from the participants of the focus group are discussed below:

Overall

Regarding suggestions for the metrics as a whole, a participant has the following suggestions: 1) Each item is aimed at the administrative colleagues on the campus, but when the principal handles school affairs, it will extend to the administrative organs, the community, and parents. The principal's resilience leadership will also face these three types of personnel. Items can also be set for these three types of objects related items. 2) It is recommended to define clear terms for the dimensions: "resilience thinking skills," "resilience ability building skills," ; 3) "resilience action skills," which can be used as the necessary basis for propositions. Level 2: The topics covered in "Resilience Ability Building Skills" and Level 3, "Resilience Action Skills," are similar and difficult to distinguish. Action Skills", and 4) Please refer to the paper comments for suggestions on text corrections for each question (**No. 1**).

Another participant has suggestions below: Firstly, this study's "Measurement Indicators of Principals' Resilient Leadership" is divided into three dimensions. They are "thinking ability," "ability building skills," and "acting skills." which can indeed meet the theoretical connotations of resilient leadership; Furthermore, the "Principals' Resilient Leadership Metrics" are also appropriately integrated into the related aspects of emotional management. It makes this study's metrics more in line with "Resilient Leadership." In the face of the risk situation of the spread of the global epidemic and the impact on school operations and students' learning quality, this research has an essential contribution to the stress resistance, resilience, and positive thinking of principal leaders. The connotation of the relevant sentences of the detailed indicators should be more obvious, such as: "2-1", "2-12", and "3-4". It may be suggested that based on the characteristics of "resilience," the concept of facing adversity and emphasizing the concept of "resilience" may be strengthened. "Resilient leadership" involves positive emotions and positive thinking. Therefore, the related content is similar to "positive leadership." The number of items shows consistency of each level's importance (**No. 2**).

In addition, other suggestions are such as The research topic is of the times and subjectivity! **(No. 3)**; The three dimensions of "resilience thinking ability," "resilience ability building skills," and "resilience action skills" are suggested to be adjusted to "resilience thinking," "resilience ability," and "resilience action" to distinguish these three dimensions more clearly.

Are the respondents to the questionnaire a teacher or principal? Different respondents have different usages of their subjects (e.g., 1-3, 1-14, 2-11); 3-9 lack of subject, so it is recommended to supplement; Some questions have more than two concepts, which can be refined, such as 1-4, 1-10, 1-1, 2-13, 2-14, 3-1, 3-6, 3-10, 3-12 **(No. 6)**.

The three dimensions of "resilience thinking ability," "resilience ability building skills," and "resilience action skills" should be rethought in terms of words (for example, "construction" has been used for the research topic, and "construction" is used for the name of the level). Three dimensions and "resilience" can be defined, which will help clarify the questionnaire preparation **(No. 4)**.

It is suggested to simplify the names of the three dimensions of "resilience thinking ability," "resilience ability building skills," and "resilience action skills" and define the three levels. Who are the respondents? Different respondents have different subjects. Each item is refined, and the description should be a manageable length. It is better to have one question and one concept. Ex.1-1 [The principal will try to understand the reality of the school from multiple perspectives and take relevant measures] is recommended to be changed to [The principal can understand the reality of the school from multiple perspectives], 1-2 can be changed to [The principal faces adversity or In times of crisis, face it with optimistic thinking] **(No. 5)**

The dimension of resilience thinking skill and its indicators

"1-5 Neutral when the principal is stressed." This indicator is more challenging to understand and correlates with thinking skills. "1-11...The principal will be vigilant and focus on future opportunities rather than 'no obstacles.'" It is suggested to change "not a hindrance" to more than "a hindrance to a problem."; "1-12 The principal emphasizes the value of expertise over 'job.'" Proposes to change 'job' to more than 'formal value of a job.' Finally, "metacognition" is a high-level cognition. Moreover, the thinking skills of metacognition can be added. For example, "the principal can be self-aware of his thinking direction and emotional management in the face of pressure in the face of adversity." **(No. 2)**. 1-3 people: Is this questionnaire self-assessment or another assessment? Confirm the key points and principal words of the text emphasized at this dimension, such as 1-4. Read just the text; 1-9 sentences could be smoother **(No. 4)**. 1-3 are different from the items at this level of thinking, and the writing can be adjusted **(No. 5)**.

The dimension of resilience capacity-building skill and its indicators

Items 2-13 and 2-14 describe the situation where there are interrogative sentences, and it is recommended to confirm them further to facilitate the response to subsequent questions. **(No. 1)** "2-12 Principals do not take other people's jobs." It needs to be clarified and easier to understand concerning resilient leadership. "2-14" suggested changing to "In the face of adversity, the principal can find colleagues who can be trusted and speak frankly about their doubts and fears". This "Level 2: Resilience Capacity Building" section has 14 indicators, and the other two levels mainly have 12 indicators. The number of indicators in the three dimensions needs to be consistent. **(No. 2)** 2-1he topic description is not very smooth; 2-5 is too general; 2-11 The concept of "having a problem with someone" is not clear **(No. 3)** 2-1, 2-10, 2-13 suggested adjustment **(No. 4)** 2-1, 2-13 and 2-14 should use affirmative sentences and lack a subject **(No. 5)**

The resilience action skill dimension and its indicators

Items 3-12 describe the situation in which there are interrogative sentences, and it is recommended to confirm them further to facilitate the response to subsequent questions. The "3-2" suggestion should be changed to "The principal can effectively respond to feedback and even criticism from all parties in the face of adversity."; "3-4 Situations where the principal will provide direction to control." It needs to be clarified, and resilient leadership is easier to understand.; "3-9" suggests adding the subject "principal."; 3-2 The word "criticism" can be used to find a more suitable term; 3-12 open questions? **(No. 1)** 3-4, 3-10 Style adjustment **(No. 4)** The above suggestions can be summarized in Tables 2 and 3.

Table 2 A summary of dimensions before and after revision

Dimension before revision	Dimension after revision
Dimension 1: Resilient Thinking Skills	Dimension 1: Resilient Thinking
Dimension 2: Resilience Capacity Building Skills	Dimension 2: Resilient Empowerment
Dimension 3: Resilience Action Skills	Dimension 3: Resilience Behavior

Table 3 A summary of suggestions for modifications for each indicator

Indicator	Suggestions of Modifications
1-1	Principals can understand the reality of the school from multiple perspectives. Principals can perceive school reality from multiple perspectives.
1-2	Principals can face adversity or crisis with an optimistic mindset.
1-3	A subject cannot be identified as self-assessment or other-assessment Text Modification: Their leadership behaviors and work styles to please others.
1-4	The text should be reconfirmed whether this item is at the level of thinking or action. Text Modification: Principals will strive to seek communication in the face of differing opinions. (action level) The principal believes that communication is essential when faced with different opinions. (belief/thinking) When someone disagrees with the principal or even opposes, I will continue to strive to seek communication, They are rejecting any further dialogue.
1-5	I need help understanding the correlation between thinking skills.
1-11	Text Modification: When a crisis or long-term adversity strikes, principals remain vigilant and focus on future opportunities rather than just the hindrances of problems. Principals remain vigilant and energized when faced with the onslaught of crisis or prolonged adversity. Focus on future opportunities rather than obstacles.
1-12	Text Modification: The principal believes that the value of expertise goes beyond the traditional value of the position.
2-6	Text Modification: Principals learn from mistakes in administrative work and improve work.
2-10	Text Modification: The principal gives members of the organization/team a clear understanding of the organization/team's vision.
2-11	Text Modification: When the principal has a problem with someone, he can talk directly to him about things.
2-12	Ambiguous and challenging to understand the relevance of resilient leadership
2-13	should not be interrogative sentences

2-14	Text Modification: Colleagues can trust and can speak up about their doubts and fears.
3-2	The word "criticism" can be used to find a more suitable term. Text Modification: In the face of adversity, the principal can effectively respond to feedback and criticism from all parties. Principals can effectively respond to work feedback and even criticism.
3-3	Text Modification: When the support of administrative colleagues is required, the principal works with them.
3-4	Text Modification: Ambiguous and challenging to understand the relevance of resilient leadership Principals can act effectively to control crises.
3-6	Text Modification: When principals encounter conflicts with colleagues, steps are taken to reduce tension.
3-9	Text Modification: Principals can work with staff to discuss solutions to problems. Principals work with staff to develop problem-solving strategies.
3-10	Text Modification: When the principal faces various situations, he can calm himself down before reacting.
3 -11	Text Modification: The principal can adopt an open attitude and be close to all colleagues.
3-12	Text Modification: When the principal faces a crisis, he can face all doubts calmly.

Based on the above discussion, the metrics for principals' leadership resilience are developed, consisting of three dimensions: resilient thinking, resilient empowerment, resilience behavior, and 38 indicators (See Figure 2 for the details).

Dimension 1: Resilient Thinking	Dimension 2: Resilient Empowerment	Dimension 3: Resilience Behavior
• 1-1 Principals can perceive school reality from multiple perspectives. • 1-2 Principals can face adversity or crisis with an optimistic mindset. • 1-3 Principals' leadership behaviors and work styles to please others. • 1-4 The principal believes that communication is essential when faced with different opinions. • 1-5 Principals can carry out their jobs under pressure. • 1-6 Principals share ideas even when resistance or ridicule is expected. • 1-7 The principal will act in the team's best long-term interests, even at a painful cost. • 1-8 When the principal encounters resistance or impediment in leadership, it does not turn into a personal grudge. • 1-9 When it comes time to decide on an issue alone, the principal follows belief. • 1-10 The principal pointed out that those persons were most qualified to make the relevant decisions, not their positions. • 1-11 Principals remain vigilant and energized when faced with the onslaught of crisis or prolonged adversity • 1-12 The principal believes that the value of expertise goes beyond the traditional value of the position.	• 2-1 Principals can successfully manage the high burden of long-term school leadership. • 2-2 The principal encourages every colleague to participate in the problem-solving process. • 2-3 Principals allow a high degree of autonomy for staff in the decision-making process. • 2-4 Principals discuss mistakes with staff so everyone can learn from them. • 2-5 Principals can address crises at work on campus. • 2-6 Principals learn from mistakes in administrative work and improve work. • 2-7 Principals reassess their job performance and continually seek to improve. • 2-8 Work support is sought when principals need specific resources. • 2-9 The principal uses job change to make it an opportunity for professional peer growth. • 2-10 The principal gives members of the organization/team a clear understanding of the organization/team's vision. • 2-11 When the principal has a problem with someone, he can talk directly to him about things. • 2-12 Principals help other people to take responsibility for finishing their jobs. • 2-13 In a crisis, a principal knows what and demonstrates confidence, competence, and leadership respect. • 2-14 Colleagues can trust and can speak up about their doubts and fears.	• 3-1 Principals can effectively collaborate with school colleagues to deal with unexpected challenges in educational work. • 3-2 In the face of adversity, the principal can effectively respond to feedback and criticism from all parties. • 3-3 When the support of administrative colleagues is required, the principal works with them. • 3-4 Principals can act effectively to control crises. • 3-5 Principals do not back down when workplace relations get strained. • 3-6 When principals encounter conflicts with colleagues, steps are taken to reduce tension. • 3-7 Principals use humor to defuse tense situations. • 3-8 The principal will only provide the information needed for personnel needs. • 3-9 Principals work with staff to develop problem-solving strategies. • 3-10 When the principal faces various situations, he can calm himself down before reacting. • 3-11 The principal can adopt an open attitude and be close to all colleagues. • 3-12 When the principal faces a crisis, he can face all doubts calmly.

Figure 2 The Metrics for Leadership Resilience of Principals

IV. Conclusions

Based on the findings, the following can be concluded: First, it is suggested to include leadership resilience with three dimensions in evaluating school performance. According to the research results, the three dimensions of principal leadership resilience are Dimension 1: Resilient Thinking; Dimension 2: Resilient Empowerment; Dimension 3: Resilience Behavior, with theoretical basis and empirical support. Therefore, educational administrative agencies should include principal leadership resilience covering the above three dimensions when evaluating principal leadership performance in the future to make the measurement of principal leadership performance more complete.

Second, leadership resilience should be included in principal training and professional development courses. According to the research, effectively handling principal campus crisis incidents has always been an essential course for principal cultivation and professional development. In recent years, the global pandemic's impact on schools has increasingly highlighted that principals must be able to respond to campus emergencies—the importance of leadership resilience. Therefore, the training of future principals or the professional enhancement of current principals should include leadership resilience in the principal cultivation and professional development courses.

Third, self-assessment of the principal's leadership resilience should be carried out to facilitate the development of individualized principal resilience courses based on individual differences. The principal's leadership resilience metrics developed in this study help collect the differences between Dimension 1: Resilient Thinking Dimension 2: Resilient Empowerment Dimension 3: Resilience Behavior of individual principals as a basis for developing individualized courses for principals.

Finally, apply the Principal's Leadership Resilience Leadership metrics as the basis for future school organizational resilience development. The principal's leadership resilience dimensions and indicators in this study can be used to assess overall school organizational resilience development. Primarily the principal's leadership resilience dimension 2: The resilient Empowerment Dimension in this study is significant for helping to develop the school's organizational capacity to respond critically to campus crises.

V. Implications

Based on the metrics for leadership resilience depicted in figure 2, here are six implications for principals' leadership:

1. **Adaptive Decision-Making:** Principals must be skilled in adapting their decision-making processes to various challenging situations. They should focus on leveraging diverse perspectives (Dimension 1, Item 1-1) and making decisions based on qualifications rather than positions (Dimension 1, Item 1-10), ensuring their actions are strategic and inclusive.
2. **Emphasis on Continuous Learning and Improvement:** Effective principals recognize the importance of learning from past experiences and mistakes (Dimension 2, Item 2-6) and continuously reassess and improve their job performance and leadership skills (Dimension 2, Item 2-7). This emphasis on growth fosters a positive school culture and drives school improvement.
3. **Building Strong Relationships:** Principals should prioritize building and maintaining strong, trust-based relationships with their staff (Dimension 3, Item 3-11). This includes being approachable during crises (Dimension 3, Item 3-12) and promoting a culture where staff feel comfortable sharing their concerns (Dimension 2, Item 2-14).
4. **Effective Crisis Management:** Principals need to develop robust strategies for managing crises, which include being able to act effectively under pressure (Dimension 1, Item 1-5) and using humor to defuse tense situations (Dimension 3, Item 3-7). Their ability to remain composed and proactive during adversity (Dimension 3, Item 3-10) is crucial for sustaining school operations during challenging times.
5. **Fostering a Collaborative Work Environment:** Encouraging collaboration and a high degree of autonomy among staff (Dimension 2, Item 2-3) helps in harnessing the collective

expertise of the school community. Principals should facilitate open discussions and involve staff in problem-solving (Dimension 2, Item 2-4), enhancing commitment and job satisfaction.

6. **Professional Development Focus:** Principals should see resource constraints as a limitation and an opportunity for creative professional development (Dimension 2, Item 2-9). This approach addresses immediate resource challenges and promotes a culture of innovation and continuous learning among the staff.

These implications highlight the importance of resilience, adaptability, continuous learning, relationship building, and strategic crisis management in effective school leadership.

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