Measurement Model of Resilient Culture: Evidence from Educational Organizations in China

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Abstract

To date, there are only a few data points to measure the progress of colleges and universities towards a resilient culture. and the various concepts used to measure resilient culture are not systematically grounded. Therefore, this paper aimed at defining the resilient culture of universities and establishing a framework for measuring it. The quantitative research method was applied, and a questionnaire was used for data collection. A total of 800 questionnaires were distributed to employees from 10 colleges and universities in Sichuan Province, China, and 705 were recovered, with a recovery rate of 88%. Purposive sampling and convenience sampling methods were used. Data analysis hires confirmation factor analysis (CFA). The results of the model analysis showed p-value of 0.000, Chi-square of 215.389, DF of 146, Chi/DF of 1.475, GFI of 0.967, AGFI of 0.957, RMSEA of 0.026, CFI of 0.992, and NFI of 0.975. It also indicated that resilient culture can be composed of four main dimensions: learning ability, values, organizational environment, independence, and flexibility. The study can benefit both practical and theoretical implications. The involved parties can assess the adaptability to change in organizations and develop more effective change management strategies; meanwhile, the scholars can refine and explore the conceptualization and the antecedents of resilience culture. In addition, resilient cultures can be used to assess the change adaptability of organizations such as universities, enabling managers to develop more effective change management strategies, and also to help organizations develop effective risk management strategies to mitigate potential negative impacts when faced with risk and uncertainty.

Keywords: Resilient culture; Learning ability; Values; Organizational environment

Introduction

In the current era of globalization and technological advances, organizations are faced with an increasingly complex and volatile environment. In order to remain competitive and innovative in the midst of this uncertainty, organizations need to cultivate a culture of resilience that enables them to adapt flexibly to external changes. The definition of resilient culture can be traced back to the psychological resilience definition in the 1970s, and its core connotation refers to the psychological quality of an individual who, when subjected to significant pressure or setbacks, can use his or her own ability to recover quickly and develop well by working with various factors such as the environment. It is a special cultural concept that allows individuals to better adapt to the environment around them. Everly & George (2011) also see this culture as a form of "psychological immunity", or the ability to bounce back from the adverse effects of adversity and argues that just as individuals can learn to develop personal resilience traits, organizations can also develop a resilient culture. Therefor, resilient culture can navigate crises and disruptions, lead to minimized losses and faster recovery, and finally have a positive impact on financial and operational performance (Suryaningtyas et al., 2019). Therefore, resilient culture has a very important role to play for organizations and individuals, but the aspects through which resilient culture influences crisis and chaos are not mentioned.

Indeed, educational organizations also face changing social, technological, and economic environments. Social changes have led educational organizations to adapt their policies, curriculum, and campus environments to be more inclusive and responsive to the needs of a divers meanwhile technologies have led to the widespread adoption of digital learning tools, online courses, and virtual classrooms causing an adjustment of organizational infrastructure. In addition, economic environments and globalization have increased intensified competitions among educational institutions, both locally and internationally, driving the need for differentiation and innovation. This suggests that changes in the organizational environment can affect all aspects of educational organizations. In addition, it is believed that it can contribute to the innovative performance of universities. Accordingly, review of the literatures found the significance of resilient culture which can make universities more dynamic and competitive, better able to meet challenges, provide faculty and students with a more creative and hands-on educational

experience, and provide society with an education that is more responsive to the needs of the times (Sihag, & Dhoopar, 2023).

Unfortunately, there are limitations to the research on key aspects of resilient cultures. In addition to the fact that no one has studied it systematically, existing research has focused only on adaptability, flexibility, and learning capability (Krasniewski, & Woznicki, 1998; Barak, & Levenberg, 2016). Consequently, it creates a room for academicians to extend related key elements. Therefore, the aim of this paper is to identify a model for the definition and measurement of resilient culture. The educational organizations have been selected to be studied since their significance lies in their contributions to individual development, social progress, economic growth, and the overall well-being of communities and nations. The study can be beneficial to related organizations from both practical and theoretical perspectives, fruitful to organizational and national level.

Research Objectives

To explore and confirm measurement models of resilient culture in an educational organization.

Literature Review

In psychology, resilience can refer to a person's ability to adapt to stress, hardship, or change. People who are psychologically resilient are better able to cope with life's challenges, recover quickly from adversity, and adapt to change. Abubakar et al. (2022), and Block and Block (1980) argue that psychological resilience enables individuals to adapt independently to changing environments by altering their behavioral tendencies as well as their ability to recover from stressful situations. Some researchers stated that psychological resilience helps individuals to flexibly adapt to hazardous environments, increase the ability of individuals to respond effectively to individual vulnerabilities and environmental stressors in potentially threatening situations, and improve individuals' protective factors against mental illness (Koronis, & Ponis, 2018; Sahu, Datta, & Mahapatra, 2017). At the organizational and cultural level, resilience usually refers to the ability of an organization or culture to adapt to change, challenges and uncertainty. Researchers argue that organizations are resilient to new societal needs that help them to keep themselves adapting in the face of an uncertain economic outlook and rapid change. To this end, organizations must

have agile, adaptable and flexible employees and leaders, and require human resource and talent management professionals to learn how to create resilient organizational cultures (Sihag, & Dhoopar, 2023; Tonetto et al., 2023). As a result, research on the definition of resilient culture has only focused on psychology and organizational culture, while research on educational institutions, such as universities, is relatively scarce. In order to better define resilient culture, the factors related to resilience and organizational culture are analyzed separately.

About the role of resilience. At the level of business or economics, resilience usually refers to a degree of sensitivity or responsiveness to change. For example, demand elasticity indicates the degree of sensitivity of demand to changes in price, and income elasticity indicates the degree of responsiveness of demand for a commodity to changes in income. Researchers analyze that in order to sustain growth in a market economy, firms must learn how to use economic flexibility to manage their businesses in order to improve their overall competitiveness, mobilize staff motivation and loyalty, optimize their human resources, stabilize their customer bases and improve operational efficiency (Sawalha, 2015). Thus, the culture of resilience can be applied to the economy. At the same time, some researchers analyze industrial ecosystems at the national level and argues that the resilience of industrial ecosystems can help a country's economy to recover faster than other economies during a crisis and can effectively respond to external crisesal.so some researchers believe that organizational learning is crucial for modern enterprises, and it is the prerequisite and foundation for organizations to survive and develop and plays a pivotal role in the success or failure of an enterprise. With regard to the organization's resilient learning function, also believes that learning organizations *should* include three levels of learning: individual learning, team learning and organizational learning. Organizations should take the individual's pursuit of continuous learning as a starting point to guide the formation of learning organizational values and humanism.

Organizational culture first attracted attention in organizational theory in 1978 (Peters, 1978), followed by Douglas (1994) and Pettigrew (1979) who stated that organizational culture explains the composition of the cognitive system of how people think, reason and make decisions. Some people believe that organizational culture is the endogenous driving force of organizational and industrial development, which influences all aspects of organizations in a subtle way, and especially plays an important role in human resource management (Dunger, 2023). Fok, Zee, and Morgan (2022) consider organizational culture as the common cognition and code of conduct of all members of an organization, which represents the core ideas and values of the organization. As

for the characteristics of organizational culture, some researchers describe values as the core of organizational culture and believes that it consists of non-specific feelings such as good and evil, beauty and ugliness, normal and abnormal, rational and irrational (Jo Hatch, & Schultz, 1997; Hofstede, 1980). Ge, Su, and Zhou, (2010) argue that the organizational culture has a guiding role on employees' work values and that under different organizational culture orientations, employees' work values will be different. DiBella, Nevis, and Gould (1996) focus on the characteristics of organizations' learning ability and analyses and researches the characteristics of learning organizations' culture, i.e., transcend themselves in organizational development and helping organizations to adapt to the accelerating pace of the information revolution and the knowledge transferring. Burhanuddin, Ben, and Supriyanto (2019) point out that the organizational culture of colleges and universities should be strengthened from three aspects. The focus is to improve the market adaptability of colleges and universities, pay attention to the changes in social demand for talents, flexibly adjust professional planning, and improve the core competitiveness and innovation ability of the university. On the other hand, some researchers believe that in addition to meeting the material needs of the faculty and staff, it is more important to create a harmonious and good campus culture, reflecting humanistic care (Adamonienė et al., 2021). The respect of students, the sense of achievement at work, and the care of leaders can prompt faculty personnel to increase their satisfaction with their positions and their sense of identity and belonging to the college, which in turn significantly reduces the turnover rate.

Through the preceding discussion, the resilience and organizational culture are developed into resilient cultures, which can be defined as an organization's positive adaptation, flexibility, and innovation to change and uncertainty. The goal of a resilient culture is to remain stable and adapt to new challenges in a rapidly changing environment, enabling the organization to better adapt to external pressures and internal change. A range of studies have explored the relationship between resilience and organizational culture. Suryaningtyas (2019), and Andrianu (2020) both found that resilient leadership and organizational culture play significant roles in mediating the relationship between organizational resilience and performance. Therefor, Key characteristics of a resilient culture include learning ability, values, the organizational environment, and the ability to be independent and flexible (Connor, 2006; Karatsoreos, & McEwen, 2011; Koole, Webb, & Sheeran, 2015; Rupčić, 2021; Amon et al., 2022).

Research Methodology

By the end of 2022, there will be 134 ordinary universities in Sichuan Province, with 2,052,000 students and 96,000 teaching staff. By 2022, six universities in Sichuan Province will be recognized as national innovation and entrepreneurship college construction units. At the same time, in conjunction with the Implementing Opinions on Further Supporting Innovation and Entrepreneurship of College Students issued by Sichuan, 10 universities were selected from this list that are relatively outstanding in terms of innovative university construction. These 10 universities have a total of 30,155 faculty members. Sample Size Tables by (Krejcie and Morgan, 1970) need to be used when there is uncertainty about the exact number of samples or populations, which results in a sample size of approximately 80 people. However due to the need for variables in the conceptual model and the fact that this study uses structural equation modeling to conduct the analysis, the need for an adequate sample size must be taken into account. Therefore the sample method of random sampling can be used (Bollen, 1989; Yuan & Bentler, 2000).

The population of this study are teachers and university staff from 10 colleges and universities in Sichuan Province and the samples used in this study were of 800 teachers and university staff. From the total, 705 were recovered, with a recovery rate of 88%. The sampling technique was purposive and convenient. Purposive sampling method was used to identify the study area and convenient sampling method was used to obtain the data. For respondents' profile, 346 (49.08%) were female and 359 (50.02%) were male. The age of the respondents ranged from 26 to 55 years (30.07 % were between 26 and 35 years, 36.03% were between 36 and 45 years, and 33.90% were between 46 and 55 years). In terms of highest level of education, 62.55% had a master's degree and 37.45% had a PHD. In terms of occupation, the largest group is Staff (61.35%) and the rest are all teachers (38.65%). In terms of universities, Chengdu University of Traditional Chinese Medicine (10.07%) and Southwest University of Science and Technology (10.21%) have the highest proportion. The research tool was a questionnaire with 5-point Likert scale, with 1 indicating strong disagreement and 5 indicating strong agreement. The measurements of the study include learning ability (LA), values (VS), organizational environment (OE) and independent and flexibility (IF), shown in Table 1.

Table 1 Constructs and items

Constructs	Code	Items
Learning ability (LA)	LA1	The university adopts innovative teaching methods or educational models
	LA2	The university regularly organises innovative projects or practical activities.
	LA3	Know how to access various information resources at the university
	LA4	Have the ability to solve the problems encountered alone when faced with difficulties in teaching and learning
	LA5	The university's incentives are a powerful incentive to motivate individuals to learn.
Values (VS)	VS1	The university's values are the same as those of the mainstream society
	VS2	The university organises regular political theory studies for staff and teacher.
	VS3	There is a great need for a values theory programme for new staff and teacher members.
	VS4	The values promoted by this University will have some influence on oneself
	VS5	The majority of teacher and staff agree with the university's philosophy of development.
Organizational environment (OE)	OE1	University teacher and staff are more connected to each other and are able to adapt effectively to new environments
	OE2	Departments in the university are very concerned about achieving their departmental goals.
	OE3	The university has a wide range of resources and information that staff need to learn and innovate.
	OE4	University management has a very important role in fostering innovation
	OE5	The university's work environment has an impact on individual productivity
	OE6	The university provides innovation resources and support, such as laboratories, tech makerspaces, business incubators, etc.
Independent and flexible (IF)	IF1	The university is a humane organization where members can share their experiences or ideas with each other.
	IF2	After completing the necessary work, the university encourages teachers and staff to freely allocate the remaining working time
	IF3	The university has sufficient autonomy in teaching, development and management.
	IF4	The university's teacher and staff have the autonomy to make their own choices and decisions about their studies and research.
	IF5	The university supports academic freedom

For data analysis, Confirmatory Factor Analysis (CFA) is employed to test hypotheses regarding the structure of relationships among variables and reveal underlying patterns in data. The model's fit was assessed using various indices: relative chi-square (Cmin/df < 5), Chi-square probability Level (p-value > 0.05), goodness of fit index (GFI > 0.80), adjusted goodness of fit (AGFI > 0.80), root mean square residual (RMR < 0.80), root mean square error of approximation (RMRSEA < 0.80), Tucker Lewis Index (TLI > 0.80), comparative fit index (CFI > 0.80), and normed fit index (NFI > 0.80) as criteria for evaluating the model's fitness.

Research Results

Confirmatory factor analysis (CFA) is a research method primarily used to measure whether the correspondence between factors and scale question items is consistent with the research hypothesis. In this study, AMOS software will be used to conduct the analyses and the variables will be subjected to confirmatory factor analysis. Figure 1 shows the structural model of resilient culture. Confirmatory factor analysis was used to test the fit of the proposed theoretical model to the actual data as a way to evaluate the structural validity of the scale. The results of the validated factor analysis showed p-value of 0.000, Chi-square of 215.389, DF of 146, Chi/DF of 1.475, GFI of 0.967, AGFI of 0.957, RMSEA of 0.026, CFI of 0.992, and NFI of 0.975. The test results suggest that the theoretical model fits well with the actual data, indicating an acceptable structural model fit. The factor loading coefficients for all entries were greater than 0.6 and there were no unacceptable values, so no modifications to the model were required.

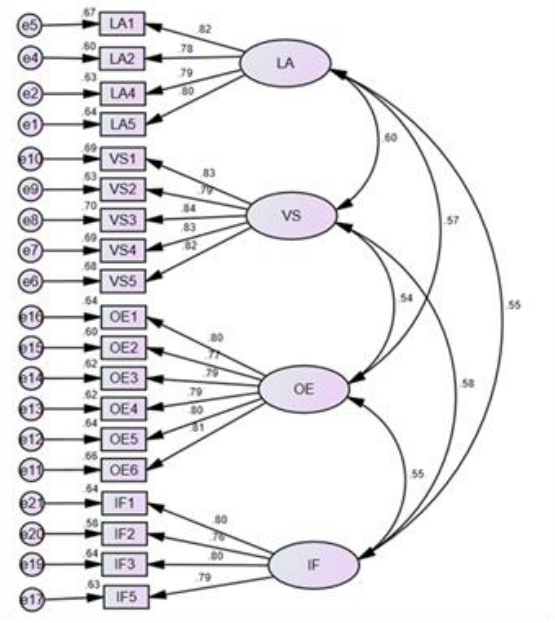

Fig.1 Confirmatory Factor Analysis of Resilient Culture

Convergent validity

Convergent validity analyses are usually carried out using the metrics average variance extracted (AVE) and composite reliability (CR), and good convergent validity is indicated if the AVE value for each factor is greater than 0.5 and the CR value is greater than 0.7, and it is also generally required that the factor loading coefficient value corresponding to each measure is greater than 0.8. Table 2 shows factor loading (FL), standard error (S.E.), t–value, p–value, squared multiple correlation (SMC), composite reliability (CR) and average variance extracted (AVE).

Table 2 Convergent validity of resilient culture

Latent variable	FL	S.E.	t–value	p–value	SMC	C.R.	AVE
LA5	0.800	n/a	n/a	n/a	0.640	0.875	0.636
LA4	0.791	0.045	22.106	***	0.626		
LA2	0.777	0.044	21.718	***	0.604		
LA1	0.821	0.047	23.299	***	0.674		
VS5	0.824	n/a	n/a	n/a	0.679	0.913	0.677
VS4	0.833	0.039	25.88	***	0.694		
VS3	0.836	0.039	26.131	***	0.699		
VS2	0.793	0.04	24.231	***	0.629		
VS1	0.828	0.039	25.762	***	0.686		
OE6	0.813	n/a	n/a	n/a	0.661	0.911	0.630
OE5	0.800	0.042	23.877	***	0.640		
OE4	0.787	0.04	23.605	***	0.619		
OE3	0.787	0.04	23.46	***	0.619		
OE2	0.775	0.04	22.971	***	0.601		
OE1	0.801	0.041	23.862	***	0.642		
IF5	0.791	n/a	n/a	n/a	0.626	0.868	0.622
IF3	0.799	0.047	21.956	***	0.638		
IF2	0.763	0.046	20.909	***	0.582		
IF1	0.802	0.047	21.971	***	0.643		

It was found, through Table 2, that the average variance extracted (AVE) for each variable was greater than 0.5 with 0.636, 0.677, 0.630 and 0.622. The composite reliability (CR) was greater than 0.7 with 0.875, 0.913, 0.911 and 0.868. Each measure corresponds to a factor

loading coefficient value greater than 0.7. This indicates that the convergent validity of this study is acceptable, which indicates that the convergent validity of this study is acceptable.

Discriminant validity

In the analysis of discriminant validity, the AVE root value and the results of correlation analysis can be used for comparison, if the AVE root value of each factor is greater than the "maximum value of the correlation coefficient between the factor and the other factors, then it has a good discriminant validity. Table 3 shows correlation metrics and AVE root value of learning ability (LA), values (VS), organizational environment (OE) and independent and flexibility (IF).

Table 3 Discriminant validity of resilient culture

Items	IF (Factor 1)	OE (Factor 2)	VS (Factor 3)	LA (Factor 4)
IF	**0.789**			
OE	0.548	**0.794**		
VS	0.579	0.545	**0.823**	
LA	0.549	0.574	0.604	**0.797**

Note: Bolded value in a triangular one represents AVE root.

The results are shown in Table 3, the diagonal of the table is the AVE root value, for example, the corresponding AVE root value of the factor is 0.789, which is greater than the correlation coefficients of Factor 1 and the other three factors (0.548, 0.579 and 0.549, respectively), and similarly, Factor 2, Factor 3, and Factor 4 were analyzed in this way. It was eventually found that the AVE root values of the factors were all greater than the values of the correlation coefficients of the factor with the other factors, thus indicating a good discriminant validity.

Discussions

From the study, it can be found that resilient culture is influenced by components such as learning capacity, values, organizational environment, and independence and flexibility. To begin with, learning ability is a vital element of a resilient culture. This model identifies dimensions of resilient culture that have some practical and theoretical significance, and can also help later researchers to continue their in-depth studies.

Organizations that adopt a culture of continuous learning are more prepared to adjust to change and surmount challenges. Kayes, Wirtz, and Burgi-Tian (2024) found that people and organizations with a robust learning orientation are more resilient when dealing with challenges. They can rapidly adjust to changing circumstances, glean insights from errors, and use fresh information for upcoming obstacles. Therefore, learning ability can effectively influence resilient culture. In higher education, encouraging resilience may improve students' learning experiences and results (Walker, 2006). This is crucial for individuals with learning difficulties, since they often exhibit exceptional resilience (Miller, 1997). Students' thoughts on resilience emphasize the need of retaining perspective, being healthy, and building support networks (Holdsworth, 2018). Enhancing students' ability to bounce back from challenges may be accomplished by incorporating work integrated learning and fostering professional identity. Developing adaptive capability and flexible learning abilities are crucial for social-ecological resilience (Fazey et al., 2007). And all of these findings are consistent with the study in this paper, thus, learning ability are an important part of resilient culture.

Meanwhile, values are crucial in developing a resilient culture, alongside learning capacity. Integrity, accountability, and openness are crucial for establishing trust and cultivating a favorable work atmosphere. Brady et al. (2020) found that companies that emphasize ethical ideals are more likely to endure challenging situations and sustain their resilience. These principles foster a strong feeling of purpose and dedication among workers, crucial for overcoming problems and sustaining a great company culture. It is evident that the development of values is very important for a resilient culture. Ungar (2015) emphasizes the need of a detailed understanding of culture and its impact on developing resilience, especially in the context of trauma associated to war and other defensive mechanisms. Andrianu (2020) provide concrete instances of resilient cultures, such the importance of persistent endeavor in Singapore and the focus on unity and inclusion in public organizations. DiTullio (2014) proposes that classroom culture may have a substantial impact on fostering academic resilience. From their findings, it is clear that values are an important part of a resilient culture.

In addition, the organizational environment is an essential element of a resilient culture. An encouraging and constructive work atmosphere is crucial for nurturing resilience and enhancing employee welfare. Research conducted by Luthans, Luthans, and Palmer (2016) indicates that a supportive corporate environment may decrease stress, enhance morale, and promote cooperation. This may assist workers in effectively dealing with challenging circumstances and

sustaining a feeling of resilience. In addition, Limphaibool, Buranapin, and Jariangprasert (2020) researched how organizational resilience in SMEs may be improved by multilayer mindfulness. They discovered that changes or unexpected occurrences from both internal and external environments can influence and promote a culture of resilience. Thus, the organizational environment can be an important influence on resilient culture.

Lastly, independence and flexibility are crucial elements of a resilient society. Organizations that provide their staff autonomy and encourage them to be proactive are more likely to successfully navigate obstacles and adjust to new circumstances. Wen–Dong Lv et al. (Lv et al., 2018) found that people with a strong sense of independence and flexibility are more capable of dealing with uncertainty and succeeding in changing situations. Organizations may promote innovation and creativity by cultivating a culture of freedom and flexibility, which are crucial for sustaining resilience under challenging circumstances. Furthermore, Rajesh (2021) studied about flexible business strategies to enhance resilience in manufacturing supply chains and found that flexibility is important for the organization that can link to the organizational resilience and supply chain, so that managers should take decisions related to flexibility implementation, towards enhancing resilience in supply chains. And the results of these studies are similar to the findings of this study.

Knowledge from Research

Studying this model provides significant insights into the crucial aspects that help build a resilient culture in educational institutions. An essential component of the measuring model is the organization's capacity for learning. This pertains to the organization's ability to assimilate knowledge from its experiences, adjust to adjustments, and consistently enhance its methods to stay efficient and pertinent in a swiftly changing educational environment. Values play a crucial role in shaping the resilient culture of an educational organization. Studying this feature provides insights into how an organization's principles, such honesty, teamwork, and creativity, help it overcome problems and succeed in difficult situations. The organizational environment plays a crucial role in the measuring model. Studying the influence of organizational structure, leadership style, and communication systems on the resilience of an organization offers significant insights for creating and sustaining a resilient culture. The measuring model emphasizes the significance of independence and flexibility in the organization. Studying this feature provides vital insights into

how promoting a culture of independence and flexibility helps an educational institution efficiently adapt and react to unexpected situations and external changes.

Conclusion

The article concludes by highlighting the importance of understanding and measuring resilient culture within educational institutions, focusing on learning ability, values, organizational environment, and independence and flexibility. Organizations may enhance their ability to adapt to change, overcome hurdles, and prosper in challenging situations by focusing on these components. Furthermore, scholarly research confirms the significance of these elements in fostering resilience in companies. Organizations must emphasize these components to build a resilient culture and guarantee long-term success.

Suggestions

This study can provide suggestions for the academic and managerial implications as well as future study. In the academic realm, this research may provide useful insights on how these firms can adeptly handle and address issues. Researchers may assess educational institutions' learning ability to determine their capability to acquire new information and skills, crucial for adjusting to evolving educational policies, technology, and social demands. Comprehending the foundational values of a resilient culture in educational institutions may provide insight into the ethical and moral standards guiding their decision-making and their dedication to advancing fair and comprehensive education. Studying the organizational environment of educational institutions may reveal the structural and cultural elements that enhance their resilience, including leadership methods, communication pathways, and stakeholder participation. This may help in creating strategies and interventions to enhance the resilience of educational organizations and enhance their overall performance. Studying the degree of autonomy and adaptability in educational institutions may provide important information about their capability to adjust and create new ideas, as well as their capacity to empower, inspire, and keep its employees.

From a managerial perspective, this study may provide practical insights for leaders and administrators. It may guide the creation of training programs to improve the educational staff's learning capacity and promote values like adaptation, teamwork, and inclusion. Managers may use this information to establish an organizational atmosphere that fosters resilience via practices including encouraging open communication, involving employees in decision-making, and

cultivating a culture of ongoing improvement. The measuring model of resilient culture may assist managers in fostering independence and flexibility in educational institutions by allowing workers to take initiative, experiment with new techniques, and adapt to changing conditions. Educational organizations in China may develop a resilient culture and enhance the progress of education in the nation by using these management recommendations.

In terms of future studies, there are several areas that warrant further exploration. Researchers might investigate how the measuring model of resilient culture impacts organizational performance by studying its effect on student results, teacher retention, and institutional reputation. Future research might investigate the influence of leadership on cultivating a resilient culture in educational institutions, and the effects of external variables like government policies and economic situations on institutional resilience.

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