

The Effect of Disaster Education on Coping Capacity and Disaster Resilience: Evidence from the UAE

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Abstract

Disaster resilience has become a major priority in contemporary disaster management, particularly in urban settings exposed to environmental, social, and institutional risks. However, limited empirical evidence exists regarding the role of disaster education in enhancing coping capacity and disaster resilience within the United Arab Emirates (UAE) context. To address this gap, this study examined the effects of disaster education on coping capacity and disaster resilience from the perspectives of Civil Defence Officers in the UAE. Quantitative research design was adopted, and data were collected through a structured questionnaire administered to Civil Defence Officers in Abu Dhabi. A total of 363 valid responses were retained for analysis. The data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) to assess the measurement model and test the hypothesised relationships. The findings indicated that the measurement model achieved satisfactory reliability and validity. The structural model revealed that disaster education has a

significant positive effect on both coping capacity and disaster resilience. Disaster education was found to be a strong predictor of coping capacity and a significant contributor to disaster resilience, highlighting the importance of knowledge, awareness, and preparedness in strengthening disaster-related capabilities. The study contributes to the disaster management literature by providing empirical evidence on the role of disaster education in enhancing coping capacity and resilience within the UAE context. The findings also offer practical insights for policymakers and emergency management agencies seeking to strengthen disaster preparedness and resilience through education and capacity-building initiatives.

Keywords: disaster education, disaster resilience, coping capacity, United Arab Emirates

1. Introduction

Disaster education has increasingly been recognised as a critical component of disaster risk reduction. It plays an important role in enhancing awareness, promoting preparedness behaviours, and supporting informed decision-making during emergencies (Fazeli et al., 2024). Communities that receive effective training and risk communication are more likely to adopt protective actions and respond appropriately during hazard events (Fu & Zhang, 2024). Empirical evidence suggests that higher levels of hazard awareness are associated with lower vulnerability and stronger resilience outcomes (Abas, 2020; Park & Kwon, 2024). These findings align with broader research that conceptualises disaster resilience as a dynamic process shaped by the interaction of vulnerability, coping capacity, and adaptive capabilities (Zaman & Raihan, 2023). Disaster education also contributes to the development of risk perception and emergency response competencies, enabling individuals and communities to recognise hazards and take appropriate actions before, during, and after disaster events (Torani, 2019). Furthermore, educational programmes that integrate practical training, simulations, and community engagement activities can improve coordination and communication among stakeholders during emergencies (Locke, 2023). Disaster education is therefore increasingly viewed as a long-term investment in community resilience, as it equips individuals with the knowledge and skills necessary to cope with uncertainty and recover more effectively from adverse events. Consistent with this view Shiozaki et al. (2024) argue that resilience is strengthened when communities possess sufficient knowledge, adaptive capabilities, and coping resources to respond to and recover from disasters. Consequently, disaster education serves as a foundational mechanism for reducing vulnerability and enhancing resilience at both individual and community levels.

Despite these developments, disaster preparedness and response capabilities continue to vary across communities, and gaps remain in awareness, behavioural readiness, and coordinated emergency response (Tyas et al., 2025). In UAE, the effectiveness of disaster risk reduction efforts depends not only on institutional capacity but also on the ability of communities to anticipate, cope with, and respond to hazards. Coping capacity, defined as the ability to manage adverse conditions using available resources, knowledge, and skills, is therefore a critical factor in reducing disaster impacts and strengthening resilience (Alblooshi, 2021; Alfzari, 2022). Although the UAE has made significant investments in disaster management and emergency preparedness systems, several challenges continue to affect disaster risk reduction efforts. Inadequate resource allocation resulting from weaknesses in management practices and institutional frameworks has been reported to reduce the effectiveness of disaster management initiatives (AL-Hammadi, 2022). Furthermore, poor safety attitudes and behaviours among operational personnel, together with insufficient supervision and safety awareness, have been identified as factors contributing to ineffective disaster management outcomes in the UAE (Yagoub et al., 2020). Studies have also suggested that the National Emergency Crisis and Disaster Management Authority (NCEMA) framework does not sufficiently address structural aspects of national emergency management required for sustainable development (Alteneiji et al., 2020; Ismail et al., 2023).

In addition, inaccurate and delayed information updates, limited expertise, and insufficient

training in advanced information technologies continue to hinder effective disaster management practices (Ruwaithi, 2019; Ahmed & Alhashmi, 2022). Inadequate knowledge sharing, limited knowledge creation regarding disaster risks, and rapid environmental changes further contribute to disaster management challenges (Alfzari, 2022). Moreover, the UAE's unique demographic structure presents additional complexities. With approximately 88% of the population consisting of non-citizens, issues related to public representation, community participation, and stakeholder engagement may affect the effectiveness of disaster management planning and implementation (Ruwaithi, 2019).

These challenges indicate that improving institutional capacity alone may not be sufficient to enhance disaster resilience. Greater attention must also be given to strengthening community-level preparedness, awareness, and coping capabilities (AL-Hammadi, 2022). Disaster education can play a crucial role in this regard by equipping individuals and communities with the knowledge and skills needed to understand risks, adopt preparedness measures, and respond effectively during emergencies. Enhanced disaster education may therefore contribute to reducing vulnerability and improving coping capacity, ultimately strengthening disaster resilience (Qingchen & Zhang, 2024).

However, the majority of disaster management research has been conducted outside the Arab region (Ejaz et al., 2019; El-kholei, 2019; Wehde, 2020; Alteneiji et al., 2020; Hany, 2022; Singh, 2022). Within the UAE, only a limited number of studies have examined factors influencing emergency and disaster management (e.g., Al Hmoudi & Aziz, 2015; Ruwaithi, 2019; Kurdi, 2021; Zainal, 2018; Alfzari, 2022; Ahmed & Alhashmi, 2022). For instance, Alfzari (2022) examined factors influencing disaster management effectiveness in the UAE, while Ahmed and Alhashmi (2022) investigated the role of geographic information systems in managing natural disasters. Although previous studies have examined disaster-related issues and preparedness in various international contexts, limited empirical evidence exists regarding the relationship between disaster education and disaster resilience in the UAE. In particular, little is known about how disaster education contributes to reducing vulnerability and strengthening coping capacity among communities in Abu Dhabi. This lack of empirical evidence limits the ability of policymakers and emergency management agencies to develop evidence-based disaster risk reduction strategies tailored to local conditions. Therefore, this study investigates the effect of disaster education on disaster resilience in Abu Dhabi, UAE. Specifically, the study seeks to provide empirical evidence on whether disaster education contributes to reducing vulnerability and enhancing coping capacity, thereby strengthening disaster resilience.

2. Literature Review

2.1 Disaster Education and Disaster Resilience

Resilience has become a central objective of disaster and emergency management; it is strengthened through adaptive learning, preparedness planning, and coordinated governance mechanisms (Meyer et al., 2018; Topno, 2021). Bell et al. (2024) argue that formal educational environments can serve as important platforms for developing disaster knowledge, climate adaptation awareness, and preparedness capabilities that contribute to

resilience-building. Developing knowledge and learning capacities is essential for enhancing resilience at community and institutional levels. Since disaster education facilitates knowledge acquisition, awareness, and adaptive learning, it may contribute to strengthening disaster resilience (Mohamed & Alhammadi, 2025). Disaster education enhances individuals' understanding of disaster risks, preparedness measures, and appropriate response actions, thereby improving their ability to cope with and recover from hazardous events. Empirical evidence supports this relationship. According to Cabello et al. (2021) disaster risk reduction education contributes to community resilience by promoting participation, preparedness, and the development of locally relevant coping strategies. Also, Cabello et al. (2021) argue that disaster risk reduction education contributes to community resilience by promoting participation, preparedness, and locally relevant coping strategies. Kankanamge and Yigitcanlar (2022) found that innovative disaster education approaches, such as gamified online learning, can significantly enhance public awareness and preparedness for disaster events. By improving disaster-related knowledge and engagement, these educational interventions contribute to strengthening individuals' capacity to respond effectively to hazards, thereby supporting disaster resilience. Similarly, John et al. (2023) argued that disaster education improves risk awareness, mitigation planning, and preparedness, thereby strengthening community resilience. Beyond improving awareness, disaster education can also strengthen community capacity and participation in resilience-building activities. Moreover, Qingchen and Zhang (2024) through a systematic review of community-based disaster education interventions, found that effective disaster education initiatives strengthen resilience capacities and contribute to improved community resilience outcomes. Providing direct empirical support, Torpus et al. (2024) reported that higher levels of disaster literacy were significantly associated with greater individual disaster resilience. Collectively, these findings suggest that disaster education plays a critical role in strengthening resilience before, during, and after disaster events. Therefore, it is hypothesized that:

H1: Disaster education has a significant *positive* effect on *Disaster Resilience*.

2.2 Disaster Education and Coping Capacity

Disaster education plays a critical role in enhancing coping capacity by improving both cognitive and behavioural preparedness (Fei Du et al., 2016). It increases awareness of potential hazards, strengthens risk perception, and equips individuals with the knowledge and skills required to respond effectively during emergencies (Fazeli et al., 2024). Coping capacity refers to the ability of individuals, communities, or systems to manage, respond to, and recover from disaster events using available resources, knowledge, and capabilities. According to Wang et al. (2020) coping capacity comprises disaster reduction ability, disaster resilience ability, and disaster relief ability, which collectively determine the extent to which a community can withstand and recover from hazard impacts. Similarly Zhao et al. (2024) demonstrated that individuals with lower coping capacity are more vulnerable to maladaptive responses when facing disaster risks, highlighting the importance of strengthening coping capacity to improve disaster management outcomes.

Disaster education contributes to coping capacity by enhancing individuals' preparedness,

self-efficacy, and response capabilities. Demirbilek and Aslan (2025) found that participation in disaster awareness education significantly improved self-efficacy, preparedness beliefs, and motivation to undertake disaster preparedness actions. These findings suggest that disaster education strengthens individuals' ability to manage disaster-related challenges and respond effectively during emergencies.

Empirical evidence further supports the positive role of disaster education in developing coping capacity. Musabber Ali Chisty (2020) reported that communities with low coping capacity possess considerable potential to improve their disaster response capabilities when provided with appropriate knowledge and skills development support. Similarly, Shuk et al. (2021) found that disaster management training significantly enhanced nursing students' disaster knowledge and perceived ability to respond to emergency situations. These findings indicate that educational and training interventions can strengthen disaster-related competencies and preparedness, thereby enhancing coping capacity. Furthermore, Imani et al. (2022) highlighted that effective coping mechanisms play a critical role in improving disaster resilience by enabling communities to better manage disaster impacts and adapt to adverse conditions. Based on the theoretical arguments and empirical evidence discussed above, disaster education is expected to strengthen coping capacity of individuals and communities. Therefore, the following hypothesis is proposed:

H2: Disaster education has a significant positive effect on Coping Capacity.

3. Research Framework

In this study, disaster education was operationalized as the independent variable, while disaster resilience and coping capacity were operationalized as the dependent variables. The proposed framework is underpinned by Sustainability Theory, which provides an important extension to disaster research by emphasizing long-term adaptation, capacity building, and resilience within social, economic, and environmental systems (Achour et al., 2014). The theory is founded on the principle that development should meet present needs without compromising the ability of future generations to meet their own needs. In the context of disaster management, this principle translates into strengthening the knowledge, skills, and capacities required to reduce disaster risks and enhance resilience over time (Chang & Cheng, 2019).

Sustainability Theory provides a useful lens for understanding how disaster education contributes to improved disaster outcomes (Brundiers, 2016). Through education, individuals and communities acquire the knowledge, awareness, and competencies necessary to prepare for, respond to, and recover from disaster events. These capabilities enhance coping capacity and support the development of disaster resilience, thereby contributing to the long-term sustainability of communities (Rodriguez-nikl, 2015). Accordingly, Figure 1 presents the conceptual framework of the study, illustrating the hypothesized relationships between disaster education, coping capacity, and disaster resilience.

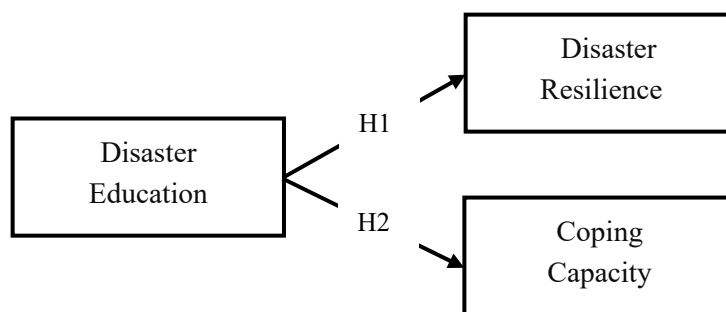


Figure 1. Research framework

4. Research Methodology

This study adopted a quantitative research approach and employed a cross-sectional survey design to examine the relationships between disaster education, disaster resilience, and coping capacity among officers of the Abu Dhabi Civil Defence. A quantitative approach was considered appropriate because it enables the collection of numerical data and facilitates the empirical testing of hypothesised relationships among variables (Usman & Lizam, 2016). Furthermore, quantitative research allows for the objective measurement of constructs and the application of statistical techniques to examine relationships among variables, thereby supporting the reliability and generalisability of the findings (Creswell, 2022). A cross-sectional survey design was adopted because data were collected from respondents at a single point in time using a structured questionnaire. This design is widely used in social science research to examine relationships among variables efficiently and systematically (Hussain et al., 2020). The questionnaire consisted of items measuring disaster education, disaster resilience, and coping capacity, which were adapted from established studies and assessed using a Likert-type scale.

The target population comprised officers serving in the Abu Dhabi Civil Defence, as they play a critical role in disaster preparedness, emergency response, and community risk reduction initiatives. Given the heterogeneous nature of the population, a stratified random sampling technique was employed to ensure adequate representation of respondents across different departments and operational units. The population was divided into relevant strata based on departmental and operational responsibilities, after which respondents were randomly selected from each stratum. To ensure that the selected respondents could provide informed and relevant responses, only officers with professional knowledge, practical experience, or direct involvement in disaster preparedness, emergency response, rescue operations, or public safety activities were included in the study.

Based on Charan and Biswas (2013), the sample size for an unknown population was determined using the following formula. The calculation resulted in a minimum sample size of 384, which was rounded to 384 respondents. The calculated sample size was 384, which was rounded to 384 respondents. Hence, a minimum sample size of 384 respondents was established for the study. Data analysis was conducted using Partial Least Squares Structural

Equation Modelling (PLS-SEM). PLS-SEM was selected because it is suitable for predictive research, theory development, and the analysis of complex relationships involving multiple latent constructs (Hair, 2022). The analysis involved evaluating the reliability and validity of the measurement model, followed by testing the hypothesized relationships among disaster education, disaster vulnerability, coping capacity, and disaster resilience. Therefore, the sample size was determined using the following formula for an unknown population, as proposed by Charan and Biswas (2013).

$$n = \frac{Z^2 \times P(1 - P)}{C^2} \quad (1)$$

Where:

- n = required sample size
- Z = standard normal deviation at the 95% confidence level (1.96)
- P = estimated proportion of the population (0.50, used for maximum variability)
- C = margin of error (0.05)

Substituting the values:

$$\begin{aligned} n &= \frac{(1.96)^2 \times (0.5)(1 - 0.5)}{(0.05)^2} \\ n &= \frac{(3.8416)(0.5)(0.5)}{0.0025} \\ n &= \frac{0.9604}{0.0025} = 384.16 \end{aligned}$$

The study targeted a sample size of 384 respondents based on the above calculation. Following data collection, the completed questionnaires were screened for completeness and suitability for analysis. A total of 363 valid responses were retained for the final analysis. Thus, the final dataset comprised 363 valid respondents, which were subsequently analyzed using PLS-SEM.

5. Results and Discussion

5.1 Measurement Model Assessment

The measurement model was assessed by examining convergent validity through factor loadings, Composite Reliability (CR), and Average Variance Extracted (AVE), as recommended by Hair et al. (2018). Convergent validity is established when indicator loadings exceed 0.70, Composite Reliability values are above 0.70, and AVE values are greater than 0.50. However, indicator loadings above 0.50 may be retained when the construct achieves satisfactory Composite Reliability and an AVE of at least 0.50 (Rönkkö & Cho, 2022). Table 1 presents the results of the convergent validity assessment.

Table 1. Constructs reliability and validity

	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Coping Capacity	0.886	0.889	0.643
Disaster Education	0.861	0.864	0.643
Disaster Resilience	0.823	0.837	0.583

The reliability and convergent validity of the measurement model were assessed using Cronbach's alpha, Composite Reliability, and AVE. As shown in Table 1, all constructs demonstrated satisfactory internal consistency reliability, with Cronbach's alpha values ranging from 0.823 to 0.886, exceeding the recommended threshold of 0.70. Similarly, the Composite Reliability values ranged from 0.843 to 0.890, indicating adequate construct reliability (Hair et al., 2019). With regard to convergent validity, the AVE values for Coping Capacity (0.643), Disaster Education (0.558), and Disaster Resilience (0.582) were all above the recommended threshold of 0.50. These results indicate that the indicators explained more than 50% of the variance of their respective constructs. Furthermore, all indicator loadings exceeded the minimum acceptable value of 0.50. Therefore, the findings confirm that the measurement model possesses adequate reliability and convergent validity, and the constructs are suitable for subsequent structural model analysis (Al Dhanhani & Abdullah, 2021).

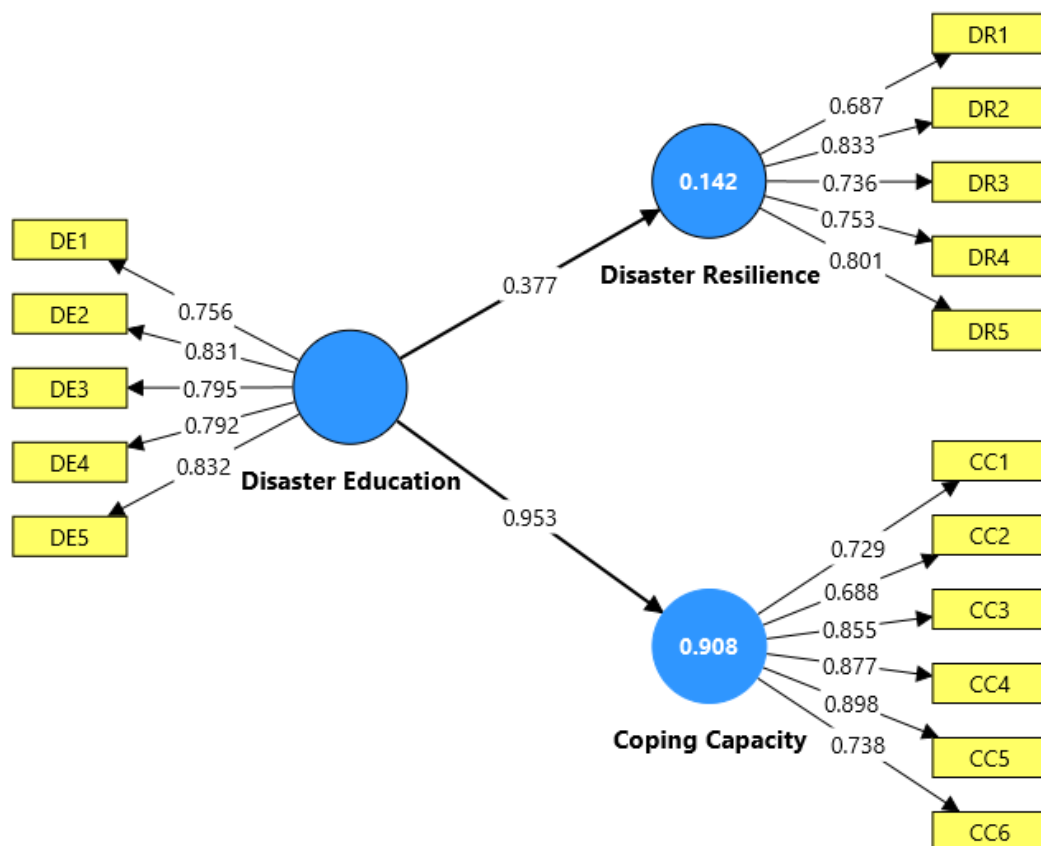


Figure 2. Measurement model

Figure 2 presents the final measurement model after the removal of items that did not meet the recommended reliability and validity criteria (Ramayah, 2016). Following the establishment of the measurement model's reliability and validity, the next step involves assessing the structural model. The structural model is used to evaluate the hypothesized relationships among the constructs and determine the extent to which the exogenous constructs influence the endogenous constructs. This assessment enables the examination of the proposed hypotheses and provides evidence regarding the strength and significance of the relationships within the conceptual framework (Hair et al., 2024).

Table 2. Significance test for the structural model path coefficient, t-statistics and p-values

Path	Std β	Std Error	<i>t</i> -statistic	<i>p</i> -value	Results
Disaster Education -> Coping Capacity	0.953	0.006	17.036	0.000	Supported
Disaster Education -> Disaster Resilience	0.377	0.042	8.878	0.000	Supported

Table 2 presents the results of the structural model assessment, including the standardized path coefficients, t-statistics, and p-values for the hypothesized relationships. The findings indicate that Disaster Education has a significant positive effect on Coping Capacity ($\beta = 0.953$, $t = 17.036$, $p < 0.001$). This result suggests that higher levels of disaster education are associated with greater coping capacity among Abu Dhabi Civil Defence officers. Therefore, H2 is supported. Also, the results show that Disaster Education has a significant positive effect on Disaster Resilience ($\beta = 0.377$, $t = 8.878$, $p < 0.001$). This finding indicates that disaster education contributes positively to the development of disaster resilience by enhancing individuals' knowledge, preparedness, and ability to respond effectively to disaster events. Therefore, H1 is supported. Thus, the findings provide empirical evidence that disaster education is an important factor in strengthening both coping capacity and disaster resilience. The results suggest that investment in disaster education programmes can enhance the ability of Civil Defence officers to manage disaster-related challenges and contribute to more resilient communities. Figure 3 presents the Structural Model with the Coefficient of Determination (R^2).

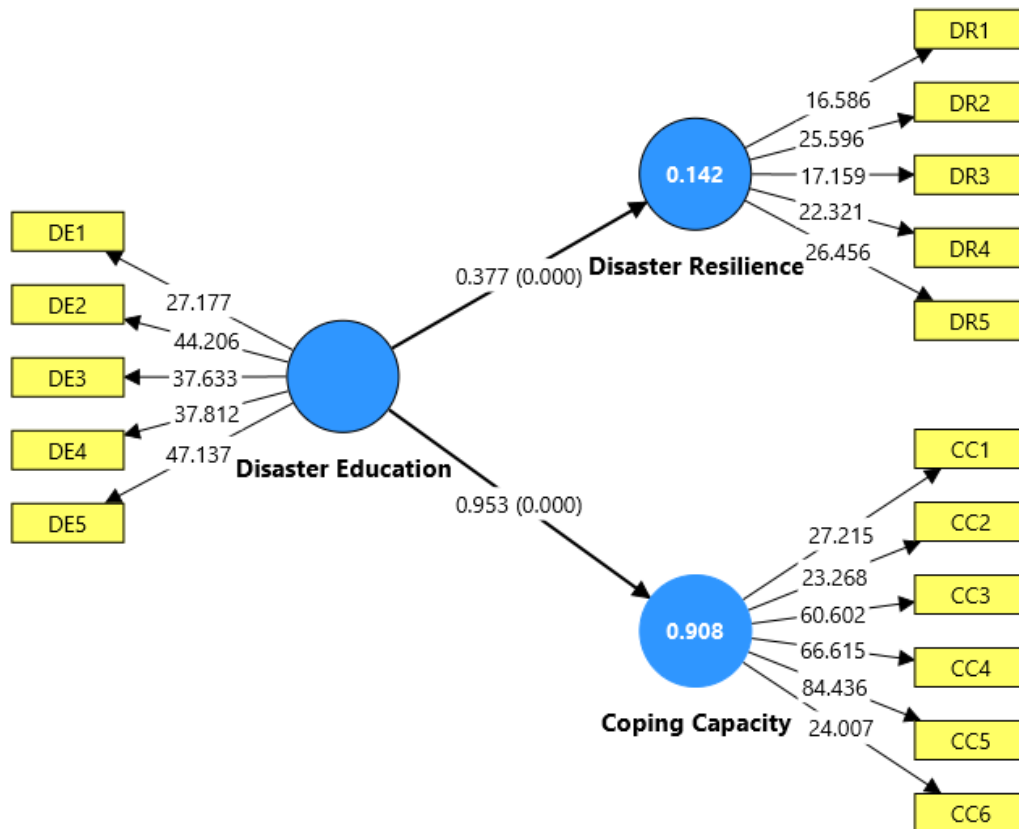


Figure 3. Structural model

Table 3. Coefficient of determination (R^2)

Indicator	R-square	R-square adjusted
Coping Capacity	0.908	0.907
Disaster Resilience	0.142	0.140

Table 3 presents the R^2 values for the endogenous constructs. Disaster Education explained 90.8% of the variance in Coping Capacity ($R^2 = 0.908$), indicating substantial explanatory power. In contrast, Disaster Education explained 14.2% of the variance in Disaster Resilience ($R^2 = 0.142$), suggesting a modest level of explanatory power. These findings indicate that Disaster Education is a strong predictor of Coping Capacity but a relatively weaker predictor of Disaster Resilience, implying that additional factors may contribute to resilience outcomes (Hair et al., 2018).

6. Implication

6.1 Theoretical Implications

This study contributes to the disaster management literature by providing empirical evidence on the role of disaster education in enhancing both coping capacity and disaster resilience. The findings demonstrate that disaster education is a significant predictor of coping capacity and

disaster resilience, thereby reinforcing the view that education is a critical mechanism for strengthening individual and organizational preparedness for disaster events. By establishing these relationships within the UAE context, the study extends existing disaster risk reduction literature, which has largely been developed in non-Arab settings. The study also contributes to Sustainability Theory by illustrating how investments in disaster education can support long-term capacity building and resilience development. The findings suggest that disaster education facilitates the acquisition of knowledge, skills, and preparedness capabilities that enable individuals to better manage disaster-related challenges and adapt to adverse conditions. Thus, the study advances theoretical understanding of how educational interventions contribute to sustainable disaster resilience outcomes.

6.2 Practical Implications

The findings have important implications for policymakers, emergency management agencies, and civil defence organizations in the UAE. Given the strong positive effect of disaster education on coping capacity, greater emphasis should be placed on the design and implementation of continuous disaster education and training programmes for emergency responders and the wider community. Such initiatives can enhance disaster-related knowledge, preparedness, and response capabilities, thereby strengthening the ability of individuals and communities to cope with disaster events. The significant relationship between disaster education and disaster resilience further highlights the need for disaster education to be integrated into broader disaster risk reduction and community resilience strategies. Emergency management authorities may strengthen resilience by expanding public awareness campaigns, simulation exercises, and capacity-building programmes that promote disaster preparedness and adaptive response behaviours. Ultimately, the findings suggest that investment in disaster education represents a practical and sustainable approach to enhancing coping capacity and building more resilient communities in the UAE.

7. Conclusion

This study examined the effect of disaster education on coping capacity and disaster resilience among Abu Dhabi Civil Defence Officers. The findings revealed that disaster education has a positive and significant effect on both coping capacity and disaster resilience. In particular, disaster education was found to be a strong predictor of coping capacity and a significant contributor to disaster resilience. The findings highlight the importance of disaster education in enhancing knowledge, preparedness, and response capabilities, thereby strengthening individuals' ability to cope with and recover from disaster events. The study contributes to the disaster management literature by providing empirical evidence from the UAE context and supports the view that disaster education is a key mechanism for building resilience and promoting sustainable disaster risk reduction. Also, the findings suggest that policymakers and emergency management agencies should strengthen disaster education and training programmes to enhance coping capacity and foster more resilient communities. Future research should examine additional factors that influence disaster resilience to further advance understanding in this field.

References

- Achour, N., Pantartzis, E., Pascale, F., & Price, A. D. F. (2014). Integration of resilience and sustainability : from theory to application. *International Journal of Disaster Resilience in the Built Environment*, 6(3), 347–362. <https://doi.org/10.1108/Ijdrbe-05-2013-0016>
- Ahmed, S., & Alhashmi, S. (2022). *Impact of Structural Geoinformation on Natural Disaster Management in United Arab Emirates*. March.
- Al Dhanhani, A., & Abdullah, N. H. (2021). The impacts of organizational culture and transformational leadership style on the employee's job performance: A case study at UAE's petrochemical company. *IBIMA Business Review*, 2020 (June). <https://doi.org/10.5171/2020.379522>
- AL-Hammadi, A. A. (2022). Structuring National Emergency Management Towards Sustainability Development for UAE: A Conceptual Approach. *Journal of Management Information and Decision Sciences*, 25(1), 1–9.
- Alblooshi, S. A. (2021). *Influence of Geographic Information System on Natural Disaster Management in the United Arab Emirate*. 11th Annual International Conference on Industrial Engineering and Operations Management, Singapore, Singapore. <https://doi.org/10.46254/AN11.20210329>
- Alfzari, S. M. K. M. (2022). *A Framework of Influencing Factors for Successful Disaster Management in United Arab Emirates (UAE)*. April.
- Alteneiji, R. H., Ahmed, V., & Saboor, S. (2020). A qualitative approach to investigate emergency preparedness state for the built environment in the UAE. *Engineering, Construction and Architectural Management*, 28(7), 2005–2022. <https://doi.org/10.1108/ECAM-05-2020-0296>
- Bell, I., Laurie, N., Calle, O., Carmen, M., & Valdez, A. (2024). Education for disaster resilience: Lessons from El Nino. *Geoforum*, 148(November 2023), 103919. <https://doi.org/10.1016/j.geoforum.2023.103919>
- Brundiers, K. (2016). *Disasters as Opportunities for Change Towards Sustainability*. December.
- Cabello, V. M., Karina, D. V, Moncada-arce, A. M., & Juillerat, F. (2021). *Disaster Risk Reduction Education: Tensions and Connections with Sustainable Development Goals* (pp. 1–18). <https://doi.org/10.3390/su131910933>
- Chang, A. Y., & Cheng, Y. T. (2019). Analysis model of the sustainability development of manufacturing small and medium-sized enterprises in Taiwan. *Journal of Cleaner Production*, 207, 458–473. <https://doi.org/10.1016/j.jclepro.2018.10.025>
- Charan, J., & Biswas, T. (2013). How to Calculate Sample Size for Different Study Designs in Medical Research? *Indian Journal of Psychological Medicine*, 35, 121–126. <https://doi.org/10.4103/0253-7176.116232>

Creswell, J. D. (2022). *Research design: Qualitative, quantitative, and mixed methods approach* (6th ed.). SAGE.

Demirbilek, Ö., & Aslan, R. (2025). Effect of Disaster Awareness Education on General Disaster Preparedness Beliefs: A Quasi-Experimental Study. *Disaster Medicine and Public Health Preparedness*, 19, e288. <https://doi.org/10.1017/dmp.2025.10219>

Ejaz, W., Azam, M. A., Saadat, S., & Iqbal, F. (2019). Unmanned Aerial Vehicles Enabled IoT Platform for Disaster Management. *Energies*, 12(14), 2706. <https://doi.org/10.3390/en12142706>

El-kholei, A. O. (2019). Are Arab cities prepared to face disaster risks ? Challenges and opportunities. *Alexandria Engineering Journal*, 58(2), 479–486. <https://doi.org/10.1016/j.aej.2019.04.004>

Fazeli, S., Haghani, M., Mojtahedi, M., & Rashidi, T. H. (2024). The role of individual preparedness and behavioural training in natural hazards: A scoping review. *International Journal of Disaster Risk Reduction*, 105, 104379. <https://doi.org/10.1016/j.ijdr.2024.104379>

Fei, D., Hirohide, K., K. O. C. O. (2016). Research on the disaster coping capability of a historical village in a mountainous area of China: case study in Shangli, Sichuan. *Procedia - Social and Behavioral Sciences*, 218, 118–130. <https://doi.org/10.1016/j.sbspro.2016.04.015>

Fu, Q., & Zhang, X. (2024). Promoting community resilience through disaster education: Review of community-based interventions with a focus on teacher resilience and well-being. *PLOS ONE*, 19(1), e0296393. <https://doi.org/10.1371/journal.pone.0296393>

Hair, J., & Alamer, A. (2022). Research Methods in Applied Linguistics Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research : Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), 100027. <https://doi.org/10.1016/j.rmal.2022.100027>

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate Data Analysis* (8th ed.). United Kingdom: Cengage Learning.

Hair, J. F., Ringle, C. M., Gudergan, S. P., Fischer, A., Nitzl, C., & Menictas, C. (2019). Partial least squares structural equation modeling- based discrete choice modeling : an illustration in modeling retailer choice. *Business Research*, 12(1), 115–142. <https://doi.org/10.1007/s40685-018-0072-4>

Hair, J. F., Sarstedt, M., Ringle, C. M., & S. P. G. (2024). *Advanced issues in partial least squares structural equation modeling* (PLS–SEM, 2nd ed.). Thousand Oaks: SAGE. https://doi.org/10.1007/978-3-319-05542-8_15-3

Hany, M. (2022). The Association Between the Success of Information Systems and Crises Management (A Theoretical View and Proposed Framework). *International Journal of Asian Social Science*, 12(1), 55–68. <https://doi.org/10.18488/5007.v12i1.4410>

Hmoudi, A. Al, & Aziz, Z. (2021). Challenges for integrated early warning and disaster

management in the UAE. *ISIJ*, 169–176. <https://doi.org/10.2495/SAFE150151>

Imani, M., Lo, S., Fakour, H., & Kuo, C. (2022). Conceptual Framework for Disaster Management in Coastal Cities Using Climate Change Resilience and Coping Ability. *Atmosphere*, 13(1), 16. <https://doi.org/10.3390/atmos13010016>

Ismail, A. A. B., Abdulazez, S. A., Raed, A., & Said, N. T. (2023). *IT Governance and Control: Mitigation and Disaster Preparedness of Organizations in the UAE*. https://doi.org/10.1007/978-3-031-12382-5_35

John, G., Gustavo, P., & Rakuasa, H. (2023). Disaster Education and the Role of Geographers : A Step Toward a Disaster Resilient Ambon City: A Review. *I(03)*, 183–192. <https://doi.org/10.59653/jemls.v1i03.238>

Kankanamge, N., & Yigitcanlar, T. (2022). *Gamifying Community Education for Enhanced Disaster Resilience: An Effectiveness Testing Study from Australia*. <https://doi.org/10.3390/fi14060179>

KrejcieandMorgan. (1970). Sample size determination using Krejcie and Morgan table. *Kenya Projects Organization (KENPRO)*, 38, 607–610. <https://doi.org/10.1177/001316447003000308>

Kurdi, O. F. Al. (2021). A critical comparative review of emergency and disaster management in the Arab world. *Journal of Business and Socio-economic Development*, 1(1), 24–46. <https://doi.org/10.1108/JBSED-02-2021-0021>

Locke, J., Dsilva, J., & Zarmukhambetova, S. (2023). Decarbonization strategies in the UAE built environment: An evidence-based analysis using COP26 and COP27 recommendations. *Sustainability*, 15(15), 11603. <https://doi.org/10.3390/su151511603>

Mohamed, M., & Alhammadi, H. (2025). Resilience in the Face of Crisis : Evaluating the UAE's Preparedness and Response to Disasters and Emergencies. *International Journal on Science and Technology*, 16(3), 1–13. <https://doi.org/10.71097/IJSAT.v16.i3.8179>

Musabber Ali Chisty. (2020). Coping capacity assessment of urban fire disaster: An exploratory study on ward no: 30 of Old Dhaka area. *International Journal of Disaster Risk Reduction*, 51. <https://doi.org/10.1016/j.ijdr.2020.101878>

Park, K., & Kwon, S. A. (2024). A study on the relationship between flood safety awareness and vulnerability/resilience. *Heliyon*, 10(21), e39819. <https://doi.org/10.1016/j.heliyon.2024.e39819>

Qingchen, & Zhang, X. (2024). Promoting community resilience through disaster education : Review of community- based interventions with a focus on teacher resilience and well-being. *PLoS ONE*, 19(1), e0296393. <https://doi.org/10.1371/journal.pone.0296393>

Ramayah. (2016). The critical success factors for organizational performance of SMEs in Malaysia: a partial least squares approach. *Review of Business*, 18(61), 370, 391. <https://doi.org/10.7819/rbgn.v18i61.3058>

- Rodriguez-nikl, T. (2015). Linking disaster resilience and sustainability. *Civil Engineering and Environmental Systems*, 0(0), 157–169. <https://doi.org/10.1080/10286608.2015.1025386>
- Rönkkö, M., & Cho, E. (2022). An Updated Guideline for Assessing Discriminant Validity. In *Organizational Research Methods* (Vol. 25, Issue 1). <https://doi.org/10.1177/1094428120968614>
- Ruwaithi, A. A. Al. (2019). A Critical Review of Emergency and Disaster Management in the United Arab Emirates. *II*, 23–35.
- Shiozaki, Y., Nagamatsu, S., Sato, K., & Bhattacharya, Y. (2024). A systematic literature review of empirical validation of disaster resilience indicators. *International Journal of Disaster Risk Reduction*, 109, 104681. <https://doi.org/10.1016/j.ijdrr.2024.104681>
- Shuk, M., Hung, Y., Kam, S., Lam, K., Chum, M., Chow, M., ... Pau, O. K. (2021). *The Effectiveness of Disaster Education for Undergraduate Nursing Students' Knowledge, Willingness, and Perceived Ability: An Evaluation Study*.
- Singh, M. K. (2022). *Information Technology in Disaster Management*. July. <https://doi.org/10.36348/sjet.2022.v07i06.006>
- Topno. (2021). Building Disaster Resilience Through Primary and Higher Education. In S. Eslamian & F. Eslamian (Eds.), *Handbook of Disaster Risk Reduction for Resilience*. Springer, Cham. https://doi.org/10.1007/978-3-030-61278-8_9.
- Torani, S., Majd, P. M., Maroufi, S. S., Dowlati, M., & Sheikhi, R. A. (2019). The importance of education on disasters and emergencies: A review article. *Journal of Education and Health Promotion*, 8(15) 85–104. https://doi.org/10.4103/jehp.jehp_262_18
- Torpus, K., Usta, G., Çinar Özbay, S., & Kanbay, Y. (2024). The Effect of Disaster Preparedness Literacy on Individual Disaster Resilience. *Disaster Medicine and Public Health Preparedness*, 18, e247. <https://doi.org/10.1017/dmp.2024.148>
- Tyas, R. A., Wilujeng, I., Rosana, D., Kuswanto, H., & Purwasih, D. (2025). A review of disaster risk reduction education implementation: Integration, trends, and trajectories. *Social Sciences & Humanities Open*, 12, 102015. <https://doi.org/10.1016/j.ssaho.2025.102015>
- Usman, H., & Lizam, M. (2016). Determinants of intention of using mortgage in financing home ownership in Bauchi, Nigeria. *International Journal of Housing Markets and Analysis*, 9(3). <https://doi.org/10.1108/IJHMA-07-2015-0033>
- Wang, T., Yang, L., Wu, S., & Gao, J. (2020). Quantitative Assessment of Natural Disaster Coping Capacity: An Application for Typhoons. *Sustainability*, 12(15), 5949. <https://doi.org/10.3390/su12155949>
- Wehde, W. (2020). Trust in Emergency Management Authorities and Individual Emergency Preparedness for Tornadoes. *Risks, Hazards and Crisis in Public Policy*, 9(2). <https://doi.org/10.1002/rhc3.12185>
- Yagoub, M. M., Alsereidi, A. A., Mohamed, E. A., Periyasamy, P., Alameri, R., Aldarmaki, S.,

& Alhashmi, Y. (2020). Newspapers as a validation proxy for GIS modeling in Fujairah, United Arab Emirates: identifying food-prone areas. In *Natural Hazards* (Vol. 104, Issue 1). Springer Netherlands. <https://doi.org/10.1007/s11069-020-04161-y>

Zainal, I. M. (2018). An Analysis of Disaster Vulnerability in The United Arab Emirates. 25–35.

Zaman, M. O., & Raihan, M. M. H. (2023). Community resilience to natural disasters: A systemic review of contemporary methods and theories. *Natural Hazards Research*, 3(3), 583–594. <https://doi.org/10.1016/j.nhres.2023.05.003>

Zhao, Q., Prooijen, J. Van, & Spadaro, G. (2024). Coping capacity attenuates the effect of natural disaster risk on conspiracy beliefs. *Journal of Environmental Psychology*, 97(January), 102363. <https://doi.org/10.1016/j.jenvp.2024.102363>

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