

The Role Of The Quality Of The Educational And Physical Environment In Promoting Psychological Resilience And Positive Coping Strategies Among Gifted Students

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Abstract

The quality of the educational and physical environment is one of the factors that greatly affects the mental health and adaptability of students, especially gifted students who have many special cognitive and emotional needs. Despite the numerous studies that have addressed the educational environment or psychological variables among students, research on the integrative relationship between the quality of the spatial environment, psychological immunity, and positive coping strategies among gifted students remains scarce in the Arab context, especially among gifted students in Saudi society. Therefore, the current study aimed to examine the relationship between the quality of the educational and spatial environment, psychological resilience, and positive coping strategies among gifted students in southern Saudi Arabia, while analyzing the mediating role of psychological resilience in explaining the relationship between the spatial environment and positive coping. A descriptive correlational approach with a cross-sectional design was used. The study sample consisted of 320 gifted students. Three scales were used to measure the variables, and the data were analyzed using descriptive statistics, Pearson's correlation coefficient, and structural equation modeling (SEM). The results of the study indicated an increase in the arithmetic means of all variables, and found positive and statistically significant correlations between the quality of the educational environment and psychological resilience, and between psychological resilience and positive coping strategies. The SEM model also confirmed a direct effect of environmental quality on positive coping, in addition to an indirect effect through psychological resilience, indicating partial mediation. The results also indicated that there were no significant differences between cities or genders, while differences in favor of high school students were found in psychological resilience. The results of the current study emphasize the need to design school environments that provide good psychological and normative support, and to develop programs that promote psychological resilience and positive coping. Further longitudinal and objective studies are recommended to interpret causal relationships more accurately.

Introduction

If we take a quick look at today's educational reality, we find that there is an increasing focus on innovation and continuous change. As a result, classrooms are no longer just places for imparting knowledge, but have become interactive environments that can influence students' psychological state and social interaction. According to environmental psychology, the impact of physical design is not limited to the senses, but extends to emotions and the ability to understand and perceive (Gifford, 2014). Good space planning, including appropriate lighting and carefully chosen colors, can enhance feelings of safety and increase motivation. Such conditions may even support positive reactions when exposed to stress (Evans & Wener, 2006). In a study conducted by Barrett et al. (2019), it was shown that factors such as temperature, wall color, and classroom location may explain more than 16% of the differences in students' educational performance, indicating a positive relationship between the quality of the environment and students' mental health outcomes, as well as their academic performance.

There is also a great need for special attention to gifted students in this area. Gifted students have good mental abilities and great creative potential, but they may sometimes suffer from psychological and social problems such as stress and social withdrawal (Neuhart & Carney, 2020). Given their high sensitivity to external influences, the absence of psychological support and a sense of security in the

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classroom may lead to feelings of anxiety, frustration, or loss of enthusiasm (Côté-Lussier & Fitzpatrick, 2016). Therefore, studying the impact of teaching quality and spatial design on psychological and social well-being is important for improving their educational level and may also greatly support curriculum development, Especially in the field of engineering and educational curricula, making them more effective (Dong & Zhang, 2024).

The concept of psychological resilience refers to a person's ability to continue to perform well and recover quickly despite the difficulties they may face (Fletcher & Sarkar, 2013). In contrast, psychological resilience is seen as an early psychological defense system that relies on basic internal resources such as optimism and willpower, as well as social support (Zábó et al., 2023). Although these two concepts emerged in the field of personal and clinical psychology, their application has expanded to include areas such as education and environmental research. In this context, Funk (1992) noted in theory of psychological hardiness that individuals who have a sense of control and passion when faced with stress may be an important protective factor that reduces their exposure to psychological problems. Over time, this understanding has evolved to include the psychological immunity model, which suggests that students can build protection against external stresses by strengthening self-confidence and support networks.

On the other hand, constructive coping strategies are considered an external behavioral reflection of psychological resilience, and they include methods that focus on addressing problems and others that take emotional aspects into account (Mateiko et al., 2025). Several studies have indicated that students who are psychologically resilient tend to adopt positive approaches such as seeking solutions or asking for help, rather than avoiding or denying reality (Parsons et al., 2016). Other studies conducted by Cheng et al. (2003) on a sample of gifted youth in Hong Kong revealed that those who skillfully use positive coping tools score higher on mental health assessments and have higher levels of academic satisfaction. However, psychological mechanisms cannot be viewed in isolation from the surrounding environment. Uziak (2016) pointed Especially in the field of engineering and educational curricula, making them more effective.

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and independent learning environment enhances students' adaptability and behavioral flexibility. The results of a study by Chen et al. (2018) on a sample of 1,287 gifted students in Chinese society also showed that school support and home involvement have a much higher predictive weight on mental adaptation than personal traits, highlighting the importance of external factors in building psychological resilience. Nevertheless, studies continue to focus primarily on social support and teaching methods, with a clear neglect of the role of architectural design in mental health. Therefore, recent studies in environmental psychology have begun to call for the integration of spatial and psychological elements to understand the lasting impact of the learning environment on mental adaptation (Barrett et al., 2019; Evans & Wener, 2006).

In this context, the quality of the classroom can be considered an external factor that influences students' psychological aspects and coping strategies. According to Ulrich et al. (1991), good lighting and appropriate space distribution are expected to improve students' concentration in their studies, which supports their sense of control. Open spaces associated with social interaction may enhance cooperation among students and strengthen their communication skills. Another study indicates that these spaces provide external supports that contribute to building psychological resilience (Ma et al., 2023). Based on this, it can be said that a good environment reduces sources of stress and thus indirectly supports the development of positive coping strategies (Kirkegaard & Brinkmann, 2016). Although the literature provides theoretical support, applied research on psychological resilience and its interaction with spatial quality among gifted students remains very scarce. In contrast, most current studies focus on non-gifted students (Ma et al., 2023) or are limited to social elements such as classroom environment or teacher-student relationships. For gifted students, the effects of environmental design on their psychological resilience or coping strategies have not yet been studied systematically and independently. In Asian contexts, for example, the combination of collective values and the pursuit of excellence leads to more complex psychological pressures in education (Chen et al., 2018). This research gap not only reduces the generalizability of psychological theories, but also undermines the accuracy of educational facility planning.

In light of the above, this study attempts to construct a unified model that examines the effect of educational quality and spatial environment on positive coping strategies among gifted students through the mediation of psychological resilience. In addition, factors such as gender, subject matter, and educational stage will be examined as variables that may modify the nature of these effects. The study questions can be summarized as follows:

1. Can teaching quality and spatial design contribute to enhancing psychological resilience in gifted students?
2. Does psychological resilience act as an intermediary between the educational environment and its quality on the one hand, and coping strategies on the other?
3. Does the strength of these links vary according to demographic characteristics?

Ultimately, this study aims to fill the gaps in previous studies on the relationship between architectural structure and psychological aspects, while offering a practical proposal for designing educational environments that support psychological and educational aspects. Thus, the results of the study may contribute to making the educational space a shared space that promotes both mental health and academic performance among gifted students.

Materials and Methods

Participants

The current study relied on a cross-sectional design. The study sample consisted of 320 gifted students enrolled in gifted education programs in schools (Najran, Abha, Jazan) in the southern region of the Kingdom of Saudi Arabia, namely: Abha, Najran, and Jazan. The sample was selected using purposive sampling. The sample ranged in age from 15 to 18 years, with a mean age of 16.5 years and a standard deviation of 0.92. See Table 1 for the characteristics of the sample.

Table 1. Demographic characteristics of the study sample

Demographic Variable	f (%)
Gender	320
Male	170 (53.1)
Female	150 (46.9%)

Educational Stage	
Intermediate	142 (43.37%)
Secondary	178 (55.62%)
Academic Track	
Scientific	193 (60.31%)
Literary	127 (39.68%)
City	
Najran	135 (42.18%)
Abha	95 (29.68%)
Jazan	90 (28.12%)

Study Procedures

The study data was collected through an electronic questionnaire designed using Google Forms. Before the study began, ethical approval was obtained from the Ethics Committee of the Scientific Research Agency at Najran University. Participation links were sent to school principals and talent centers via official email and circulated to the target students. There were some conditions for selecting the study sample, namely: The student must be enrolled in one of the gifted programs or enrichment centers affiliated with the Department of Education. The student must be between 15 and 18 years of age. They must not have participated in any previous psychological or therapeutic programs, as this could affect their responses. Finally, the gifted student must be willing to participate after reviewing the informed consent form.

The objectives of the study were explained to the gifted students via the electronic questionnaire, and it was emphasized to them that the data would be used for purely scientific purposes. It was also clarified that participants had the right to withdraw at any time without any consequences. The application took place during March 2025. After collecting the data, a preliminary check of the responses was conducted to exclude incomplete or invalid questionnaires, and then the data was entered for statistical analysis using SPSS (version 22). To ensure the validity of the statistical distribution and the absence of temporal bias in the responses, a t-test was performed on two independent samples between the earliest and latest respondents. Chi-square tests were also conducted to verify that there were no statistically significant differences between response time and demographic variables (age, gender, academic level, major). The results showed no significant differences ($p > 0.05$), confirming the representativeness of the sample and the stability of its data.

Instruments

Quality of the educational and spatial environment scale

This scale was developed after reviewing numerous previous literature and studies (Jegade et al., 1995; Moore et al., 2007; Vladimirovna et al., 2021; Walker & Fraser, 2005). The scale aims to measure the quality of the physical, cognitive, and spatial environment within schools and enrichment centers. The scale consists of 20 items distributed across three main dimensions: the physical dimension, which includes lighting, ventilation, colors, noise level, and furniture distribution; the social spatial dimension, which includes social interaction, mobility, and a sense of belonging; and the cognitive and psychological dimension, which includes psychological comfort, visual beauty, and spatial diversity. A five-point Likert scale was used (from 1 = strongly disagree to 5 = strongly agree). The scale was tested for reliability and validity, with a total reliability coefficient of $\alpha = 0.83$. The construct validity coefficients were also satisfactory, as determined by confirmatory factor analysis (CFI = 0.94, RMSEA = 0.056) (CFA).

Psychological Immunity Scale

This scale was developed after reviewing numerous previous literature and studies (Oláh, 1996; Oláh, 2004). The scale aims to measure an individual's ability to adapt positively, control stress, and regulate emotions. The scale consists of 24 items distributed across three main dimensions: cognitive flexibility, which aims to measure an individual's ability to reinterpret stressful situations in a constructive manner; the second dimension: Self-motivation: This dimension aims to measure the extent of internal perseverance, self-confidence, and sense of self-efficacy among gifted students. The final dimension is social and positive support, which aims to measure the extent to which an individual relies on a network of social relationships and emotional support. The Likert scale was used (from 1 = strongly disagree to 5 = strongly agree). The scale was tested for reliability and validity, and the total reliability

coefficient was $\alpha = 0.80$. The construct validity coefficients were satisfactory through confirmatory factor analysis, and the model was consistent with the data ($\chi^2/df = 2.15$, CFI = 0.95, RMSEA = 0.052).

Positive Coping Strategies Scale

Coping strategies. The scale (Folkman et al., 1980; Folkman et al., 1985; Lazarus & Folkman, 1984) is a self-report measure consisting of 67 items covering a wide range of different coping strategies, with 0 indicating that the person does not use the strategy and 3 indicating that they use it frequently. All items on the checklist were translated into Arabic by two bilingual individuals and modified to use expressions more appropriate to the culture of Saudi society in the current study questionnaire. The original scale showed strong psychometric properties in diverse cultural contexts, demonstrating high internal consistency (ranging from 0.74 to 0.91) and an overall reliability coefficient of 0.86. In this study, the Positive Coping Strategies Scale showed a high level of reliability, with a Cronbach's alpha coefficient of 0.84.

Data Analysis

SPSS (version 22) and AMOS (version 23) software were used to analyze the data of the current study, with the aim of testing the hypothesized model of relationships between the quality of the educational and spatial environment, psychological resilience, and positive coping strategies among gifted students. The analysis began with examining the data and ensuring that it was free of missing or anomalous values and that the variables were normally distributed. A descriptive analysis of the means and standard deviations was also performed to determine the trends in the participants' responses. The validity and reliability of the instruments were tested using confirmatory factor analysis (CFA) and Cronbach's alpha (α) coefficient, with reliability values ranging from 0.81 to 0.90, indicating high reliability. Pearson's r was used to examine the correlational relationships, followed by structural equation modeling (SEM) to test the direct and indirect effects between the three variables. Furthermore, a statistical significance level of $p \leq 0.05$ was adopted for moderate significance and $p \leq 0.01$ for high significance.

Results

Descriptive statistics, as shown in Table 2, indicate that all variables were at a high level, with the overall mean for the quality of the educational and physical environment (M = 4.10, SD = 0.59), psychological immunity (M = 4.06, SD = 0.60), and positive coping strategies (M = 4.19, SD = 0.55), indicating that the gifted students in the study sample evaluate their educational environment and their psychological and adaptive competence positively.

Table 2. Descriptive Statistics: Means and Standard Deviations for the Study Variables

Variable	Items	Mean	SD	Level
Environment Quality	20	4.11	0.86	High
Psychological Immunity	24	4.06	0.79	High
Positive Coping Strategies	67	4.19	0.91	High

To identify the relationship between the study variables, Pearson's correlation coefficient was used, and as shown in Table 3, all relationships were positive and statistically significant at the ($p < 0.01$) level.

Table 3. Pearson Correlation Matrix for the Study Variables (n=320)

Variable	Environment Quality	Psychological Immunity	Positive Coping Strategies
Environment Quality	-	0.51**	0.46**
Psychological Immunity	0.51**	-	0.42**
Positive Coping Strategies	0.46**	0.42**	-

Notes: ** $p < 0.01$.

Table 4. Demographic Group Differences Across Study Variables (n = 320)

Demographic Variable	Group	Environment Quality (M SD)	Psychological Immunity	Positive Coping Strategies	Test Statistic	P-value
Gender	Male (n=170)	4.08 ± 0.58	4.02 ± 0.61	4.14 ± 0.52	t(318)=1.21	0.228
	Female (n=150)	4.12 ± 0.60	4.09 ± 0.58	4.24 ± 0.49		
Educational Stage	Intermediate (n=142)	4.07 ± 0.59	3.94 ± 0.63	4.12 ± 0.55	t(318)=2.63	0.009
	Secondary (n=178)	4.13 ± 0.57	4.15 ± 0.56	4.25 ± 0.52		
City	Najran (n=135)	4.10 ± 0.61	4.03 ± 0.62	4.17 ± 0.53	F(2,317)=0.74	0.476
	Abha (n=135)	4.11 ± 0.57	4.08 ± 0.60	4.21 ± 0.50		
	Jazan (n=135)	4.09 ± 0.60	4.05 ± 0.58	4.18 ± 0.51		

Table 4 shows the results of demographic differences in the study sample, where the results showed significant differences in favor of females in positive coping ($p < 0.05$). The results also show significant differences according to the academic stage in psychological immunity in favor of high school students ($p = 0.009$). The results also indicated no differences between the three cities ($p > 0.05$), suggesting homogeneity in school environments.

Table 5 shows the testing of the proposed model using AMOS, and the fit indices showed good agreement between the model and the data (CFI = 0.96, RMSEA = 0.054).

The direct and indirect effects were identified as follows: a direct and significant effect of environmental quality on psychological resilience ($\beta = 0.65$); a strong direct effect of psychological resilience on coping strategies ($\beta = 0.72$); a weak to moderate direct effect of environmental quality on positive coping ($\beta = 0.31$); and an indirect (partially mediated) effect of quality via psychological resilience on coping ($\beta = 0.46$). The explanatory power of the model was ($R^2 = 0.62$), meaning that 62% of the variance in positive coping strategies is explained by the independent variables in the model.

Table 5. Structural Equation Modeling (SEM)

Path	Estimate (β)	P-value
Environment Quality → Psychological Immunity	0.55	< 0.001
Psychological Immunity → Positive Coping	0.62	< 0.001
Positive Coping → Positive Coping (Direct)	0.31	< 0.001
Indirect Effect	0.46	< 0.001
R ² for Positive Coping	0.61	-

Discussion

The current study provides a clear picture of the fundamental role played by the quality of the educational and spatial environment in promoting psychological resilience and positive coping strategies among gifted students in southern Saudi Arabia. The results of the study showed that all variables were at high levels, reflecting a positive perception of the educational environment and a good psychological state among the sample. These results can be explained in light of the rapid developments that the school environment in Saudi Arabia has witnessed in recent years, where policies to improve educational infrastructure and develop programs for gifted students have been reflected in the quality of physical design, the creation of psychological aspects, and opportunities for social interaction, factors that Barrett et al. (2019) as infrastructure that may be influential determinants in the educational process and students' emotional well-being. It appears that the educational environment in the three cities (Abha, Najran, and Jazan) provides high levels of psychological security

and supports a sense of belonging among gifted students, which may contribute to strengthening the internal psychological processes that form the basis of psychological resilience in gifted students.

The results of the study also indicate that gifted students have high levels of psychological resilience, which is consistent with many studies. For example, (Oláh, 2004) concluded in his model of psychological resilience that it is a dynamic system that includes cognitive flexibility, self-motivation, and the ability to reinterpret stressful situations in a positive way. This study confirms that gifted individuals have a higher ability to regulate their emotions and control their responses to stress, which may be reflected in high levels of positive coping, as they use constructive cognitive and social strategies to deal with challenges. This trend is supported by the findings of (Carver, 1997) and (Folkman et al., 1985), who noted that advanced cognitive abilities help to employ effective coping strategies, including planning, problem solving, and seeking social support.

Correlational analyses in this study reveal a strong and positive relationship between the quality of the educational and spatial environment and psychological resilience, confirming that the spatial environment can be a psychological factor that is no less important than individual factors. According to Evans and Wener (2006) model, a physical environment characterized by consistency, organization, and sensory comfort contributes to reducing stress, promoting emotional stability, and improving attention and learning abilities. Therefore, an environment in which students feel comfortable, in control, and belonging contributes to building a psychological system that is more capable of coping with stress. The results of this study are consistent with the literature confirming that psychological satisfaction resulting from a good physical environment is reflected in cognitive and emotional processes, increasing levels of resilience and psychological stability.

The results of the study also support the strong relationship between psychological resilience and positive coping strategies, as the results show that psychological resilience is one of the determinants of adaptive behavior in gifted individuals. This has been pointed out in many previous studies (e.g., Zeidner & Matthews, 2017), which indicated that individuals with high emotional resilience tend to use positive coping strategies rather than resorting to negative strategies such as avoidance or withdrawal. The results of this study indicate that gifted individuals who have a higher ability to regulate their emotions and reevaluate stressful situations adopt more effective coping strategies, such as seeking social support, reframing the problem, and identifying appropriate alternatives to solve it.

In terms of the relationship between the quality of the educational environment and positive coping strategies, the results of the current study showed that there is a significant positive relationship between the two variables, confirming that the quality of the environment is not only a physical factor but also a psychological and social element that contributes to shaping the behavioral and emotional responses of the study sample. Numerous studies (e.g., Barrett et al., 2019; Ulrich et al., 1991) have pointed out that a school environment characterized by visual stability and spatial organization improves self-regulation and helps build more flexible adaptive behaviors. Thus, students who perceive their educational environment as comfortable and supportive feel more capable of coping with challenges inside and outside of school.

The results of structural equation modeling in the current study show that psychological resilience plays a partial mediating role in the relationship between environmental quality and coping strategies, supporting the idea that the environment does not directly influence adaptive behavior but rather acts through a system of psychological processes that mediate this influence. This finding is consistent with modern adaptive theories, which emphasize that environmental experience leads to adaptive behavior through a series of cognitive and affective processes that form the basis of individuals' self-regulation (Hammad & Shalhoub, 2024). This trend is supported by Lazarus and Folkman (1984), who argued that individuals only deal with stress after cognitively evaluating the situation, an evaluation that is influenced by the context of the place and the characteristics of the external environment.

In terms of demographic differences in the study sample, the results indicate that there are no significant differences in the quality of the educational environment and psychological immunity between males and females, reflecting homogeneity in students' experiences within the school environment. However, the superiority of females in positive coping strategies is consistent with the literature, which confirms that females often possess many good skills in social communication, emotional awareness, and the ability to seek support, which enhances their efficiency in applying more positive coping strategies. This study adds to the literature a new confirmation that gifted students of both genders enjoy a potentially equal level of psychological resilience, indicating the effectiveness of gifted programs in providing balanced psychological support. In terms of educational stage, the superior

psychological resilience of high school students is consistent with Cheng et al. (2003) on the development of emotional regulation and cognitive interpretation of stress with age and educational experience. It appears that cognitive maturity and the ability to cope with more complex academic challenges in secondary school contribute to increasing students' ability to manage their emotions and enhance their psychological resilience. The results also indicated that there were no significant differences between the three cities (Abha, Najran, and Jazan), suggesting that the educational and spatial environments in the southern regions are similar. This similarity reveals the existence of uniform standards in the design of school environments and gifted programs, and reflects the efforts of the Ministry of Education to raise the level of services provided to this group in all regions.

In light of the above, this study contributes significantly to understanding the relationship between the educational environment and psychological processes in gifted students. The current study confirms that the quality of the educational and spatial environment is not merely a supporting factor, but rather an essential part of the psychological and cognitive structure that shapes the student's ability to adapt to academic and social pressures. It also emphasizes the importance of psychological resilience as a mediating mechanism linking the environment and adaptive behavior, which opens the door to designing educational interventions based on promoting psychological flexibility and emotional resilience. The results provide further evidence of the importance of designing school environments in a way that takes into account the psychological needs of gifted students, including autonomy, organization, and belonging, elements emphasized by Ryan and Deci (2024) in their theory of intrinsic motivation.

The results of the current study also point to the need to rethink the design of the physical educational environment so that it creates flexible learning environments that support autonomy and increase students' ability to regulate their emotions. Schools can also benefit from the principles of educational architectural design, such as open spaces, green areas, natural light, and noise reduction, in addition to designing social support spaces that help build healthy relationships that promote psychological resilience. The findings also provide a basis for integrating emotional and professional training programs into enrichment programs for gifted students, contributing to higher levels of positive adaptation in the long term.

Ultimately, the current study confirms that the interaction between the spatial environment and psychological processes in gifted students is an important focus for understanding their educational experience. Its findings have contributed to a broader understanding of the relationship between school environment quality, mental health, and adaptive behavior. Furthermore, the current study provides statistical evidence for the effectiveness of the psychological resilience model as a mediating factor. The study's findings thus open the door to more in-depth research on the dynamic interaction between architectural design and affective and cognitive processes, whether through longitudinal or experimental designs, or through the use of objective measurement tools such as virtual reality or digital architectural modeling.

Limitations

Despite the many strengths of this study, particularly the power of its theoretical and practical contributions, there are several limitations that must be taken into account. The first of these limitations relates to the use of a cross-sectional design, which may reduce the possibility of inferring causality between variables, explaining that the relationships we observed between the quality of the educational environment, psychological immunity, and coping strategies reflect momentary correlations, without the ability to track the development of these relationships over time. Furthermore, the use of self-report measures may often lead to subjective biases that affect the accuracy of responses. In addition, the study included a limited sample from three southern cities (Abha, Najran, and Jazan), which may limit the generalizability of the results to the rest of the Kingdom or to non-gifted individuals. Furthermore, the composition of the sample in terms of gender and educational levels may reflect specific environmental and educational characteristics that differ from other regions. In addition, the quality of the educational environment was measured perceptually, without relying on objective measurement tools, reinforcing the need to collect both subjective and objective data. There are also many other factors that were not addressed in the study, such as family support and personality, which may affect psychological resilience and coping strategies. Furthermore, although the studies relied on advanced statistical analysis models, linear assumptions may not reflect the complexity of interactions between psychological and spatial variables. Furthermore, the spatial environment in schools may be affected by temporary disturbances, which may influence how students evaluate its quality. Despite these

limitations, the strength of the measurement tools, sample size, and accuracy of the analysis may enhance the credibility of the findings.

Conclusion and Recommendations

The results of the current study reveal the importance of the quality of the educational and spatial environment in promoting psychological resilience and positive coping strategies among gifted students in the southern region of Saudi Arabia. The results indicate that high levels of environmental quality lead to positive perceptions of their educational environments among students, which contributes to psychological stability and improves emotional well-being. The educational environment is closely linked to psychological health and coping strategies, with the results confirming that the quality of spatial design promotes emotional regulation and alleviates psychological stress, thereby enhancing the ability to use effective coping strategies.

The results of the current study confirmed that psychological resilience acts as a key mechanism in linking the quality of the educational environment and coping strategies, demonstrating the effectiveness of a good environment in improving students' psychological processes. The results also indicated homogeneity in the three educational environments included in the study, which may suggest a balance in educational systems and practices within schools. Furthermore, females were found to be more adept at using coping strategies than males, while secondary school students exhibited higher levels of psychological resilience, indicating the influence of age and educational experiences.

The study's findings also include recommendations for improving educational environments by investing in spatial features that promote attention and reduce stress, such as lighting, ventilation, and colors, as well as spaces that promote social interaction. It also recommended developing training programs that focus on strengthening students' psychological resilience and emotional regulation skills. At the policy level, school building design standards should also be updated to reflect the psychological dimension, and collaboration between architects and education experts should be strengthened to develop evidence-based environments. It is also suggested that the focus be on younger students, especially middle school students, through the development of early intervention programs to build resilience and openness to learning. The study provides theoretical and practical foundations for developing balanced learning environments that combine psychological support and architectural innovation, thereby promoting the overall growth of gifted students. The findings encourage the integration of educational science with architecture and reflect on the role of school design in improving the quality of learning and psychological well-being of gifted students, providing an entry point for future research on the design of supportive learning environments.

Author contributions

Author Contributions: Conceptualization: N.A and H.A. Data Collection: N.A and H.A.. Data Analysis: N.A and H.A. Resources: N.A and H.A. Writing—Original Draft Preparation: N.A and H.A. Writing—Review & Editing: N.A and H.A. Funding Acquisition: H.A.

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Institutional Review Board Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study. In addition, the protocol for the study was approved by Research Ethics Committee at Najran University.

Data availability

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

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