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# Associations between psychological fitness and creative self-efficacy among academically gifted university students in light of some variables

Sara Asem Reiyad[1], Eslam Elsayed Abdelshafy[1], Hussam Khalifa Aldawsari[2], Mamdouh Mosaad Helali[3*]

[1]*Mental Health Department, Faculty of Education, Helwan University, Egypt.*
[2]*Psychology and Education Department, College of Education, King Faisal University, Saudi Arabia.*
[3]*National Research Centre for Giftedness and Creativity, King Faisal University, Saudi Arabia.*

Corresponding author: Mamdouh Mosaad Helali (*Email: mhelali@kfu.edu.sa*)

## Abstract

Two important factors that can have a significant impact on university students' academic achievement and general well-being are psychological fitness (PF) and creative self-efficacy (CSE). The study aimed to investigate the relationship between academically gifted students' psychological fitness and creative self-efficacy. A purposeful sample of 380 academically gifted male and female students was chosen from Helwan University to meet the study's goals. The subjects were given the PF scale and the CSE scale using a descriptive correlational analytical approach. The findings showed that PF and CSE differed statistically significantly between males and females, in favor of females. Furthermore, there were no significant differences in PF or CSE according to the academic specialization variable or the gender-academic specialization interaction. Additionally, the results showed that PF and CSE were positively correlated. By integrating these insights into psychological and educational programs, institutions can empower academically gifted students to achieve their full potential while maintaining resilience and emotional stability. These efforts are essential for fostering a generation of innovative leaders capable of navigating complex challenges and contributing meaningfully to society.

**Keywords:** Academically gifted students exhibit creativity, Psychological fitness, Self-efficacy.

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## 1. Introduction

Academically gifted students represent the true wealth and human capital essential for fostering growth, cultural progress, and future development. These students are distinguished by a set of mental characteristics and traits that make them a distinct type from others, such as the superior ability to reason, understand meanings, and think logically, in addition to a set of emotional characteristics that distinguish them from ordinary students, including moral maturity and extreme sensitivity to expectations. However, these emotional characteristics may be affected positively or negatively based on the level of psychological fitness (PF) enjoyed by academically gifted students.

PF plays a pivotal role in the lives of university students. It reflects their ability to positively adapt to academic and life pressures while maintaining psychological and emotional balance, enabling them to navigate diverse challenges. PF is recognized as a key factor in achieving academic success and personal stability. It enhances students' performance and contributes to developing their skills and capacities to address difficulties effectively. The concept of PF refers to the emotional capacity to adapt to life's stressful events. It is defined as the modifiable ability to utilize resources and skills to adapt flexibly to challenges or opportunities [1]. PF encompasses the ability to manage psychological challenges effectively while maintaining emotional balance and overall well-being. According to positive psychology, PF improves individuals' satisfaction and happiness by strengthening their ability to cope with stress and life challenges. Key factors such as optimism, resilience, and persistence contribute to building PF and directly enhance personal well-being and quality of life [2].

A relatively recent addition to educational and psychological literature, creative self-efficacy (CSE) has gained attention from scholars in the early 21st century. It is regarded as a specific facet of general self-efficacy, expressing people's confidence in their capacity to carry out certain tasks in a particular setting, regardless of how challenging they may be [3]. Although gifted students have a variety of intellectual qualities, including the capacity for creativity, this capacity by itself cannot produce creative work because an individual's beliefs that precede their performance drive them to perform at the desired level. Furthermore, strong and useful ideas that support people's persistence and direct them toward endeavors that eventually boost their confidence in their creativity are provided by CSE [4, 5].

According to research, students who have CSE are more likely to achieve academically and develop their social and emotional identities in a balanced way. It significantly impacts their academic achievement, influencing how they perceive their abilities and translating these perceptions into innovative ideas and actual performance in educational settings. CSE is closely linked to undertaking challenging tasks that require perseverance and determination [6]. In essence, CSE reflects individuals' beliefs in their creative abilities, particularly when tackling tasks that demand unconventional and innovative solutions. It also increases a person's capacity for persistence and enhances their ability to approach obstacles or problems they encounter at work in a fresh and different way. Their confidence that they can overcome these obstacles in a creative manner consequently contributes to their success. Additionally, CSE encourages people to be more proactive and open to learning to accomplish their objectives. Motivating people to achieve difficult tasks and anticipate great outcomes requires CSE [7].

Moreover, enhancing CSE is associated with increased intrinsic motivation. Students possessing elevated CSE exhibit enhanced dedication to realizing their academic and personal objectives. They perceive themselves as capable of transforming ideas into tangible outcomes, which bolsters their persistence and reduces the likelihood of giving up when faced with challenges. Instead, they view these challenges as opportunities to apply their creative skills. Thus, fostering CSE not only enhances academic performance but also contributes to the comprehensive development of students' personalities. It instills independence and determination to achieve success through innovative and sustainable approaches, ultimately strengthening their PF [8].

## 2. Study Problem

The exploration of psychological variables, such as PF and CSE, holds great significance in mental health research due to their profound impact on students' academic performance and overall well-being. In the contemporary academic environment, students face numerous challenges that can adversely affect their PF and CSE. These challenges underscore the need to investigate the dynamic interplay between these variables and to understand the causal relationships that connect them.

Research continuously underscores the significance of CSE as a crucial element in improving academic achievement and cultivating intrinsic motivation in students. For instance, Meinel, et al. [9] found that students with strong beliefs in their creative abilities are better equipped to confront challenges and overcome obstacles through innovative strategies. Similarly, Huang, et al. [10] demonstrated a significant correlation between creativity, academic success, and PF. Students who are able to generate new ideas and solutions are more likely to achieve their learning goals, enhancing their sense of accomplishment, which is an essential component of psychological well-being.

From a mental health perspective, PF is equally crucial in helping students build resilience to academic and social pressures. According to Han [11], increasing awareness of PF through structured educational interventions can significantly enhance students' mental health. These interventions improve their ability to manage stress, adapt to challenges, and maintain emotional stability. Even academically gifted students, despite their exceptional achievements, face unique pressures that require robust PF to navigate effectively.

The current study aims to investigate certain characteristics and the relationship between academically gifted students' psychological fitness and creative self-efficacy through the following questions:

1. Are there differences in psychological fitness among academically gifted university students based on gender and academic specialization?

2. Are there differences in creative self-efficacy among academically gifted university students based on gender and academic specialization?
3. Is there a statistically significant relationship between psychological fitness and creative self-efficacy among academically gifted university students?

## 3. Objectives of the Study

Examining the relationship between academically gifted' PF and CSE is the main goal. In particular, to investigate how social and psychological elements affect this population's growth in self-efficacy and creative skills.

## 4. Rationale and Significance

By adding to the body of information in the field of mental health, this study advances the theoretical understanding of PF and CSE. It sheds light on how these factors affect academic achievement and creativity in university students who are academically gifted. The study also proposes a theoretical framework for analyzing these variables and developing effective assessment tools. These tools can help students manage their emotions, cope with stress, and optimize their creative and academic potential. It also supports mental health by helping them manage social and academic pressures more effectively. It promotes equity by emphasizing the importance of providing equal opportunities for academically gifted students from diverse backgrounds, which reduces the risk of underutilized talent.

## 5. Theoretical Framework and Literature

Academically gifted students are an important resource for societies, and it is necessary to invest in their education to unlock their full potential. These students have the responsibility of advancing their nations and driving progress. Strategic initiatives are needed to cultivate academically gifted students as future leaders and contributors to scientific expertise, enabling them to contribute to the advancement of society. This will fulfill the need for innovation, productivity, and leadership in Egyptian society and enhance creative productivity.

### *5.1. Psychological Fitness (PF)*

The concept of PF in students' demands balanced attention to physical activity, cognitive resilience, sleep quality, and motivation. Educational leaders, along with policymakers, should focus on these areas to build an environment that promotes complete student well-being and academic achievement. The emphasis on physical fitness has led to the neglect of PF, which includes mental, behavioral, and emotional traits necessary for overall well-being. PF is comparable to psychological energy, with higher energy leading to increased happiness and better mental health [12]. The distinction between mental health and mental fitness exists because mental health describes psychological status, while mental fitness teaches performance-enhancing tools.

PF is a critical dimension of the broader concept of total force fitness, defined as the integration and enhancement of cognitive processes, behaviors, and emotions to positively impact performance, well-being, and stress response. These resilience factors serve as precursors to the complex processes through which individuals manage stress, forming the foundation for PF [13]. Healthy individuals engage in higher levels of physical fitness activities as well as mental fitness [14]. Thus, the concept of PF reflects an individual's ability to absorb physical, social, and professional skills and abilities to adapt to their environment and face challenges without falling into a cycle of exhaustion or stress [15].

According to Al-Dekhail [16], PF in athletically gifted students is demonstrated through several indicators. These include self-esteem, the ability to control emotions, a positive outlook on life, social competence, achievement motive, the ability to cope with anxiety, and self-confidence. These indicators reflect the gifted person's awareness of their importance and value, their skill in managing emotions during competitions, their optimistic outlook on life, their ability to interact effectively with others, their desire to compete and excel, their ability to cope with stress, and their confidence in their mental, physical, and skill potential.

Bates, et al. [17] identified key internal resources integral to PF, including awareness (recognizing one's abilities, strengths, and weaknesses, including emotional and cognitive dimensions that contribute to individual resilience and performance), beliefs (core ideas individuals hold as truths that influence self-confidence and psychological stability), coping (the ability to manage stress effectively through adaptive thoughts and behaviors that sustain energy and capacity), and decision-making (processes involving evaluation and selection of courses of action to address problems or achieve goals). It also consists of five basic dimensions: self-esteem and self-confidence, emotional control and coping with anxiety, social competence, achievement motivation, and a positive outlook on life [16].

Graham [18] described PF as a dynamic ability to navigate life challenges, adapt to change, and maintain psychological balance. It encompasses resilience, emotional intelligence, cognitive flexibility, and effective stress management strategies. He also outlined the pillars of PF as follows: emotional resilience (the ability to recover from adversity, regulate emotions, and maintain stability during challenges), cognitive agility (flexible thinking, problem-solving skills, and adaptability to new information or circumstances), stress management (developing effective mechanisms to mitigate stress and its impact on mental health), and self-awareness (understanding one’s emotions, thoughts, and personal triggers to foster growth, self-compassion, and resilience).

Although research on PF remains relatively limited, existing studies emphasize its crucial role in promoting academic success and emotional well-being among students. Al-Dekhail [19] focused on identifying the relative contributions of five major personality factors and thinking styles on the PF of 127 sports-gifted secondary school students in Kuwait. The results

indicated that PF could be predicted through liberal, external, hierarchical, conservative, and judgmental thinking. Meanwhile, Muhammad [20] and Muhammad [21] investigated the correlation between PF, self-confidence, and feelings of happiness in educable mentally retarded children. The findings indicated that there were positive relationships between PF, self-confidence, and feelings of happiness in these children.

Hammermeister, et al. [22] conducted an analysis of the PF skills of first-generation university students (N=286) and their impact on resilience and academic performance. The results showed that students with strong PF skills exhibited significantly higher levels of resilience compared to their peers in the other groups. Mostafa [23] investigated the relationship between role models as perceived by adolescents and both their sense of belonging and PF among 197 university students. The findings demonstrated a positive relationship between adolescents' perceptions of each role model, their sense of belonging, and PF. Additionally, Al-Hayani [24] aimed to identify the correlations between PF and the academic achievement motive among 300 university students from both sexes. The findings showed that PF and academic achievement motivation differed statistically significantly between males and females, with females being more motivated. Furthermore, PF and academic achievement motivation were positively correlated. According to Ahmed and Dabash [25], there was a positive correlation between PF and planning for future life skills, and there were no significant differences in PF based on gender or academic specialization.

Fari and Kurdi [26] identified the relationship between mindfulness and PF for 304 high school female teachers in Makkah Al-Mukarramah. The findings showed that mindfulness and PF were positively correlated, and that marital status significantly affected PF. Hbash [27] sought to reveal the correlation between dimensions of PF and the feeling of satisfaction in a sample of 248 recent college graduates. The results indicated a positive relationship between the feeling of satisfaction and PF among young people, while there was no significant difference by gender in PF and no statistically significant difference by the educational track variable. Andrieieva, et al. [28] examined the effectiveness of PF interventions in alleviating stress-related conditions among high-achieving female students in higher education. The findings demonstrated that participants in PF programs experienced significant reductions in post-traumatic stress disorder symptoms, improved emotional well-being, enhanced mood, greater resilience, and better overall academic performance.

*Creative Self-Efficacy (CSE)*

Bandura [29] observed that people's thoughts, feelings, and actions all influence their sense of self-efficacy. People's attitudes toward their mental and emotional capacities influence how they choose activities and life tasks. CSE is essential for students and teachers, as it impacts their success, abilities, and motivations in educational situations, and raises their educational level. Individuals characterized by CSE feel highly confident and are able to find new solutions and ideas, and solve problems creatively [30-33]. CSE extends the broad idea of self-efficacy, which is related to perceived competence in accomplishing tasks, by focusing on the belief in one's capacity to generate creative solutions [4]. This belief can influence choices, effort, persistence, and success in achieving desired outcomes Beghetto [30] and Schunk and DiBenedetto [34]. Bandura [35] posited that creativity requires sustained effort and competence to overcome challenges, while Tierney and Farmer [4] emphasized that CSE is essential for initiating and maintaining creative endeavors, particularly when faced with obstacles.

CSE describes a person's confidence in their capacity to generate unique and innovative ideas, overcome obstacles connected to creativity, and accomplish creative outcomes in various circumstances. This concept reflects a person's confidence in addressing situations that require innovative problem-solving and the generation of new ideas [30]. Individuals who possess high levels of CSE can connect the reasons behind their actions, the sources of their knowledge, and the strategies they need to meet the demands of situations and needs that interfere with their ability to achieve their goals. They also have greater confidence in these abilities, see difficulties as challenges, and exert more effort to overcome them independently [36]. Additionally, Heilat [37] and Lin and Wang [38] defined CSE as an individual's belief in their creative abilities, focusing on problem-solving, idea generation, and the successful implementation of these ideas. In essence, it represents self-confidence in one's creative abilities. CSE is defined as the confidence an individual has in applying their creative skills to unprecedented challenges and achieving goals that require innovative thinking, as highlighted by Raihan and Uddin [39]. Suherman and Vidákovich [40] add that CSE involves the feeling of being capable of successfully performing creative tasks, which includes the ability to generate, develop, and implement ideas.

The concept of self-efficacy was inspired by Bandura's social cognitive theory, although it did not clarify the nature of CSE. Accordingly, studies on CSE evolved separately from Bandura's work and sought to determine if CSE was capable of forming its own concept, distinct from being confused with general self-efficacy or considered one of its components [41]. According to Bandura [35], the most important factors influencing people's daily lives and decisions are their perceptions of their own self-efficacy, which can lead to either passive or positive self-evaluation.

Abbott [41] developed a comprehensive theory of CSE that integrates reflective observations and practical insights, making it both actionable and testable. His theory underscores the principle of reciprocal determinism, highlighting the interplay between the environment, behavior, and the individual. CSE is presented as a central component of this interaction. Furthermore, Abbott [41] underlined that people who have a high level of CSE are confident in their capacity to use creative action to influence their environment. He differentiated between two core components: efficacy expectations (confidence in one’s ability to perform a specific behavior) and outcome expectations (anticipation of the results or outcomes derived from performing the behavior).

There are many studies that have focused on examining the CSE among different age samples, and among these studies are: the research of Tan, et al. [42], which focused on examining the emotions and creativity self-efficacy of 279 Singaporean high school students before and after they participated in a three- to five-day foreign service-learning program. The findings showed that CSE had a negative correlation with negative affect but a positive correlation with positive affect (life satisfaction

and subjective happiness). In contrast, Puozzo and Audrin [8] focused on the relationships among college students' study habits, CSE, and creativity. The sample consisted of 60 students from Hsiuping Institute of Technology in central Taiwan. The research findings revealed that the study process directly predicted creativity, and the relationship between the study process and creativity was partially mediated by CSE. Michael, et al. [43] examined the association between innovative behavior, optimism, and CSE. The study's findings demonstrated that employees who have a high degree of CSE also exhibit a high degree of innovative behavior at work. A high level of CSE is mediated by optimism. However, Karwowski and Lebuda [31] investigated how the big five personality traits related to two variables: creative self-efficacy and creative personal identity. They found that CSE and creative personal identity were correlated with all five personality traits: negatively with neuroticism and agreeableness, and positively with openness to experience, extraversion, and conscientiousness. Al-Zoubi [44] examined CSE levels for Jordanian gifted students and their teachers. The sample included 190 seventh and tenth grade gifted students and 44 teachers of gifted students who were randomly selected. The study revealed that gifted students and their teachers demonstrated high CSE levels; however, no gender-based differences emerged between students or teachers.

Al-Sahly [45] identified the CSE and its correlation with the level of ambition among 348 students at Kuwait University. The findings revealed that there were no differences in the CSE according to gender and academic specialization, and there was no correlation between CSE and the level of ambition, which is also what Al-Zahrani [46] study concluded. Ali [47] determined the level of CSE and the relationship between CSE, social support, and self-management among 140 students from Jazan University's education faculty. The study revealed a significant correlation between CSE, self-management, and social support, but no significant differences were observed according to the specified criteria. In addition, CSE can be predicted through self-management and social support. Othmas [48] identified CSE and educational aspirations as predictors of Najran University students' academic quality of life. The results revealed a significant relationship between the domains of CSE and educational aspirations. While there were differences between males and females in the domains of the CSE scale, females were favored.

Al-Qudah [49] investigated the correlation between habits of mind and CSE among 420 Jordanian gifted students. The findings indicated that the levels of habits of mind and CSE were high, with differences in the means of gifted students in some habits of mind and CSE attributed to gender, favoring females. Additionally, a positive correlation was found between habits of mind and CSE. As Al-Rababah [50] indicated, the gender and academic year variables did not produce any significant statistical differences in cognitive representation efficiency or CSE among students from Al-Balqa Applied University.

In the same context, Chen and Cheng [51] studied the relationship between gender, emotional intelligence, self-esteem, and CSE for gifted children in northern China. The results showed that emotional intelligence significantly and positively predicted CSE in gifted children. Additionally, Khasawneh and Al-Oweidi [52] found the predictive ability of 21st-century skills in CSE among a sample of 380 gifted students in Jordan, along with high rates of CSE. They also determined how 21st-century skills predicted CSE in this sample. The findings demonstrated both a statistically significant positive correlation between students' 21st-century skills and CSE, as well as high rates of CSE.

## 6. Research Methodology

The study adopted a descriptive correlational analytical approach to achieve results capable of answering the research questions by revealing and measuring the relationship between PF associated with CSE among academically gifted students at Helwan University. It also employed a quantitative approach for data collection.

### *6.1. Participants*

The population consisted of all second and fourth-year students at Helwan University in Egypt. Cluster random sampling was conducted among academically gifted university students (380 students, 163 male and 217 female). Academically gifted students are individuals who demonstrate outstanding performance in mental ability, creative ability, or the ability to achieve high academic success, and exhibit exceptional skills compared to their peers of the same age. The researchers in the current study define them as high-achieving students who have obtained a grade of "very good" or higher in the cumulative average during the first semester of the academic year 2024-2025.

**Table 1.**
Participants' distribution by academic specialization, gender, and grade.

| Demographic variable | Groups | Frequency | Percentage (%) | Age | |
|---|---|---|---|---|---|
| | | | | Mean | Std. |
| Gender | Male | 163 | 42.89% | 20.13 | 1.233 |
| | Female | 217 | 57.11% | 20.08 | 1.127 |
| Specialization | Scientific | 158 | 41.58% | 20.35 | 1.151 |
| | Humanitarian | 222 | 58.42% | 19.92 | 1.157 |
| Academic year | Second year | 241 | 63.42% | 19.30 | 0.459 |
| | Fourth year | 139 | 36.58% | 21.50 | 0.569 |
| Total | | 380 | 100% | 20.10 | 1.172 |

*6.2. Study Tools*

*6.2.1. Psychological Fitness Scale*

This scale, initially created by the researchers, consisted of a total of 32 items categorized into four distinct dimensions: competence in coping with stress, achievement motivation, emotion management, and persistence. A five-point Likert scale was used (1 = strongly disagree, while 5 = strongly agree).

*6.2.1.1. Validity of Psychological Fitness Scale*

Before conducting the exploratory (EFA) and confirmatory factor analysis (CFA), the researchers used Pearson's correlation coefficient to confirm the degree of correlation between the items and the overall PF scale score in a psychometric research sample that included 230 male and female students from Helwan University. According to the results, the correlation coefficients between the items and the overall score of the PF scale ranged from 0.379** to 0.755**, which are statistically significant values exceeding the acceptable limit of 0.30. As a result, the scale remains composed of 32 items.

Hotelling's principal component method [53] was then conducted on the set of 32 items utilizing Varimax rotation. The sample size is suitable since the Kaiser-Meyer-Olkin test for sample adequacy yielded a result of 0.922, which is higher than 0.60. The value of Bartlett's test of sphericity was 4194.347 with a degree of freedom of 496, which is significant at 0.001. An initial assessment was carried out to ascertain the eigenvalues corresponding to each data factor. Notably, four components exhibited eigenvalues surpassing Kaiser's threshold of 1 and collectively accounted for 56.50% of the total variance. Factor loading post-rotation is detailed in Table 2.

**Table 2.**
Accepted items with their factor loadings for each factor of the PF scale.

| Item | Competence of coping with stress | Item | Persistence | Item | Emotion management | Item | Achievement motivation |
|---|---|---|---|---|---|---|---|
| 1 | 0.780 | 28 | 0.695 | 19 | 0.842 | 14 | 0.716 |
| 25 | 0.775 | 8 | 0.692 | 31 | 0.787 | 2 | 0.646 |
| 17 | 0.760 | 12 | 0.674 | 23 | 0.700 | 10 | 0.614 |
| 29 | 0.749 | 32 | 0.620 | 3 | 0.582 | 18 | 0.516 |
| 9 | 0.742 | 4 | 0.581 | 15 | 0.528 | 6 | 0.472 |
| 27 | 0.722 | 20 | 0.563 | 11 | 0.487 | 22 | 0.409 |
| 13 | 0.710 | 16 | 0.529 | 7 | 0.480 | | |
| 26 | 0.702 | | | | | | |
| 24 | 0.671 | | | | | | |
| 30 | 0.601 | | | | | | |
| 21 | 0.507 | | | | | | |
| 5 | 0.483 | | | | | | |
| Eigenvalues | 7.022 | 4.424 | | 3.776 | | 2.86 | |
| % Variance | 21.94% | 13.82% | | 11.80% | | 8.94% | |
| %Cumulative | 21.94% | 35.77% | | 47.57% | | 56.50% | |

Then, the researchers conducted a confirmatory factor analysis of the PF scale to test whether all the observed measures and factors (competence in coping with stress (CCS), persistence (PRS), emotional management (EM), and achievement motivation (AM)) are organized around one latent factor, which is PF. This assumption was verified using confirmatory factor analysis, as shown in Table 3 and Figure 1.

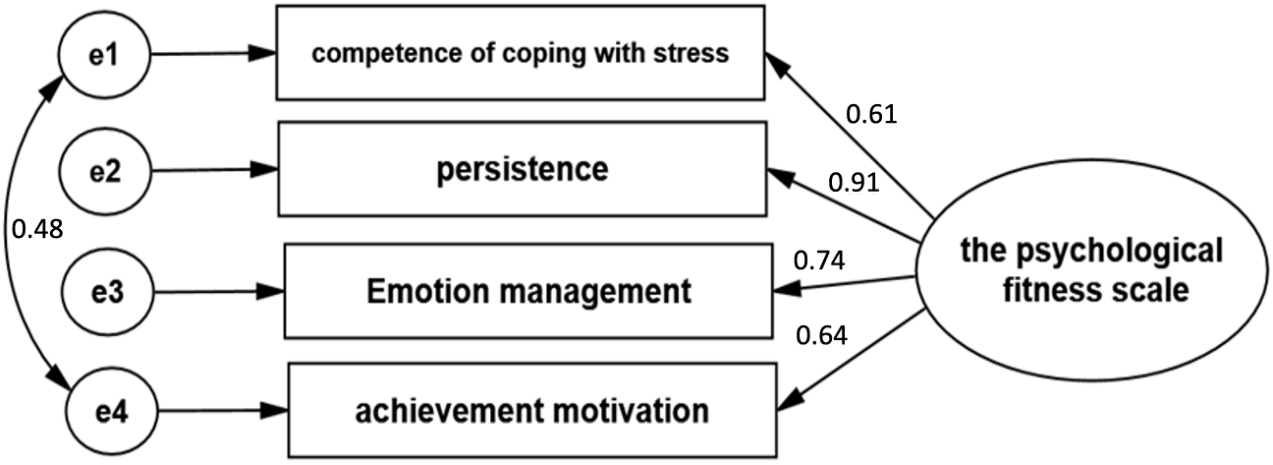


**Figure 1.**
Diagram for the PF scale's confirmatory factor analysis.

**Table 3.**
Fit indicators for the PF scale's confirmatory factor analysis model.

| Indicator | Chi-square (CMIN) | CMIN/df | RMR | GFI | NFI | RFI | IFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|---|
| Value | 1.358 at (df=1) | 1.358 | 0.249 | 0.997 | 0.997 | 0.980 | 0.999 | 0.995 | 0.999 | 0.040 |
| Ideal range for the indicator | Not significant | Less than 5 | approaching zero | 0 to 1 | 0 to > 1 | 0 to > 1 | 0 to > 1 | 0 to > 1 | 0 to 1 | Less than 0.08 |

Table 3 showed that the value of Chi-squared ($\chi^2$) reached 1.358, which was a statistically insignificant value. The values of the fit indicators were within the range of acceptable goodness of fit; the value of the ratio index between $\chi^2$ and degrees of freedom (CMIN/df) reached 1.358, which was a good value that falls within the ideal range. The root mean square index of the residuals (RMR) was 0.249, which is nearly zero. The values of the GFI, CFI, TLI, NFI, AGFI, and IFI indices reached 0.997, 0.971, 0.997, 0.980, 0.999, 0.995, and 0.999, which were acceptable values close to 1. The root mean square error of approximation (RMSEA) score of 0.040, which was less than 0.08, indicated that the model fits the data well. The results also indicated that the saturated values of the observed factors of the PF scale reached 0.61, 0.91, 0.74, and 0.64, and all of these values were statistically significant at 0.01.

*6.2.1.2. Reliability of Psychological Fitness Scale*

The Cronbach's alpha and omega coefficients for the dimensions and the overall degree were used to confirm the scale's reliability. The scale has a high degree of reliability, as indicated by the calculated Cronbach's (α) and omega (ω) coefficients, which were 0.924-0.925 for competence in coping with stress, 0.847-0.846 for persistence, 0.838-0.839 for emotion management, and 0.786-0.787 for achievement motivation, and for the whole scale (0.940-0.937).

*6.2.2. Creative Self-Efficacy Scale*

This scale, initially created by the researchers, consisted of a total of 20 situations that express the students' ability to be creative and solve problems. These situations were categorized into two distinct dimensions: creative self-efficacy in creative thinking (CSECT) and creative self-efficacy in creative performance (CSECP).

*6.2.2. 1. Validity of Creative Self-Efficacy Scale*

Before conducting EFA and CFA, the researchers verified the correlation of items with the total score of the CSE scale in the psychometric research sample. The results revealed that the values of the correlation coefficients between items and the total score of the CSE scale ranged from 0.411** to 0.649**, which are statistically significant values and greater than the acceptable limit of 0.30. Thus, the scale consists of 20 items.

Hotelling's principal component method [53] was then conducted on the set of 20 items utilizing Varimax rotation. The Kaiser-Meyer-Olkin test for sample adequacy was calculated with a value of 0.829, which is greater than 0.60, indicating that the sample size is appropriate. The value of Bartlett's Test of Sphericity was 1237.732 with a degree of freedom of 190, which is statistically significant at 0.001. An initial assessment was carried out to ascertain the eigenvalues corresponding to each data factor. Notably, two components exhibited eigenvalues surpassing Kaiser's threshold of 1 and collectively accounted for 36.342% of the total variance. Factor loading post-rotation is detailed in Table 4.

**Table 4.**
Items that were approved together with the factor loadings for each CSE scale factor.

| Item | CSECT | Item | CSECP |
|---|---|---|---|
| 13 | 0.664 | 12 | 0.789 |
| 8 | 0.599 | 14 | 0.758 |
| 1 | 0.598 | 2 | 0.693 |
| 7 | 0.591 | 20 | 0.475 |
| 9 | 0.584 | 16 | 0.457 |
| 19 | 0.582 | 6 | 0.422 |
| 15 | 0.572 | 4 | 0.392 |
| 17 | 0.554 | 10 | 0.366 |
| 3 | 0.522 | | |
| 11 | 0.507 | | |
| 18 | 0.469 | | |
| 5 | 0.362 | | |
| Eigenvalues | 4.08 | Eigenvalues | 3.189 |
| % Variance | 20.40% | % Variance | 15.94% |
| %Cumulative | 20.40% | Cumulative% | 36.34% |

The confirmatory factor analysis performed by the researchers is displayed in Table 5 and Figure 2.

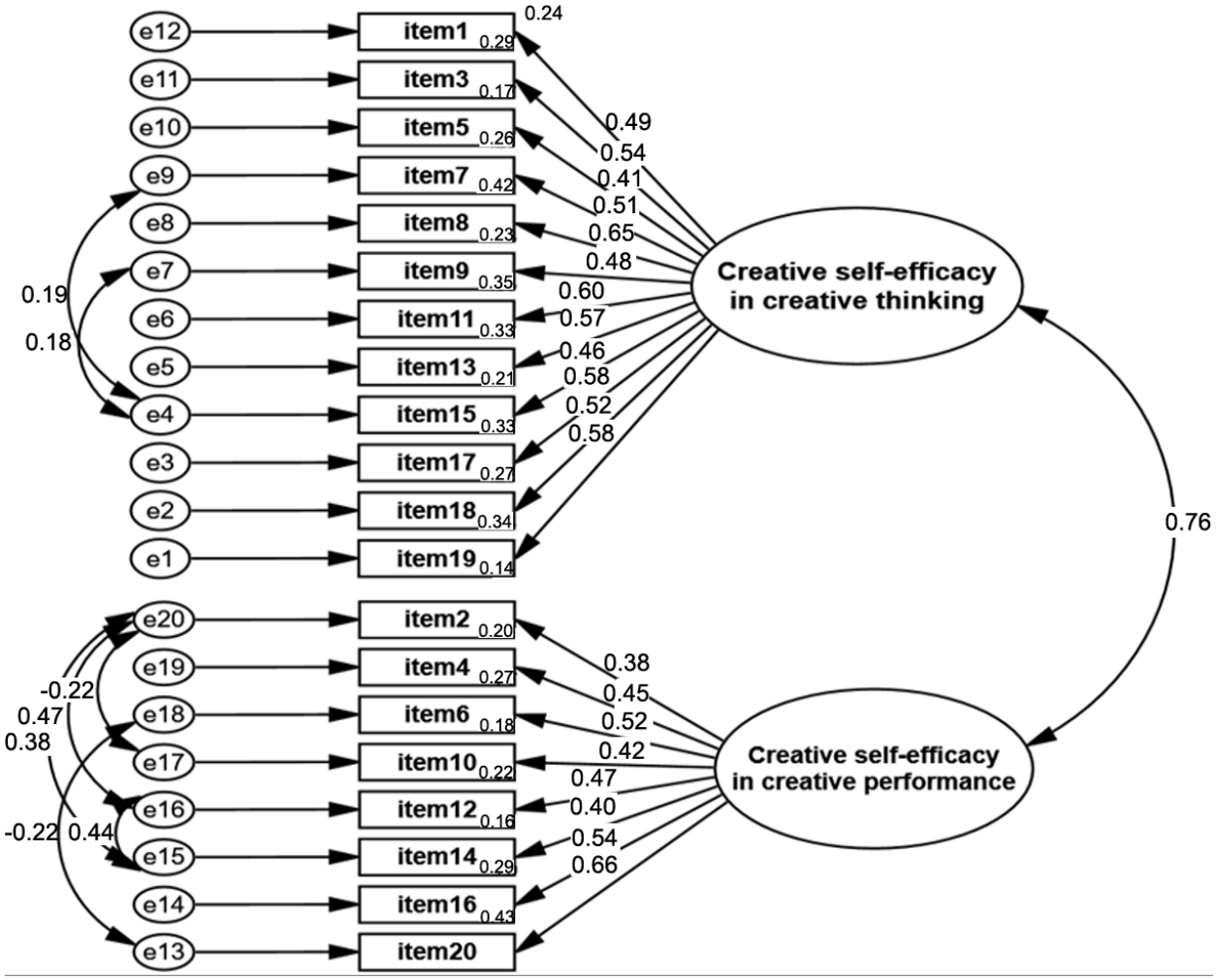


**Figure 2.**
A diagram of the CSE scale's CFA.

**Table 5.**
Findings from the CSE confirmatory factor analysis.

| Items | Factors | Non-Standardized regression weights (β) | Standardized regression weights (β) | S.E. | C.R. | P. value |
|---|---|---|---|---|---|---|
| 1 | Creative self-efficacy in creative thinking. | 0.789 | 0.494 | 0.129 | 6.117 | *** |
| 3 | | 0.855 | 0.540 | 0.131 | 6.547 | *** |
| 5 | | 0.653 | 0.407 | 0.125 | 5.215 | *** |
| 7 | | 0.765 | 0.511 | 0.122 | 6.273 | *** |
| 8 | | 1.048 | 0.652 | 0.140 | 7.488 | *** |
| 9 | | 0.904 | 0.479 | 0.152 | 5.961 | *** |
| 11 | | 1.036 | 0.596 | 0.147 | 7.039 | *** |
| 13 | | 0.885 | 0.572 | 0.129 | 6.835 | *** |
| 15 | | 0.789 | 0.455 | 0.138 | 5.699 | *** |
| 17 | | 0.834 | 0.578 | 0.121 | 6.89 | *** |
| 18 | | 0.762 | 0.521 | 0.120 | 6.372 | *** |
| 19 | | 1.000 | 0.581 | | | |
| 2 | Creative self-efficacy in creative performance. | 0.532 | 0.377 | 0.114 | 4.674 | *** |
| 4 | | 0.560 | 0.452 | 0.101 | 5.552 | *** |
| 6 | | 0.787 | 0.516 | 0.139 | 5.654 | *** |
| 10 | | 0.681 | 0.424 | 0.130 | 5.251 | *** |
| 12 | | 0.659 | 0.467 | 0.116 | 5.674 | *** |
| 14 | | 0.584 | 0.398 | 0.118 | 4.943 | *** |
| 16 | | 0.84 | 0.537 | 0.132 | 6.366 | *** |
| 20 | | 1.000 | 0.656 | | | |

Table 5 displays the findings of the confirmatory factor analysis of the CSE scale. It was discovered that the critical value for each standardized regression weight was statistically significant at 0.001. The findings also demonstrated the validity of the factor structure model of the CSE scale for the psychometric study sample, with standardized regression coefficients being high and ranging between acceptable and good values (0.377 to 0.656). By calculating the fit indices, the suggested model's goodness of fit was further validated; most of them demonstrated a good fit.

**Table 6.**
Fit indicators for the CSE scale's confirmatory factor analysis model.

| Indicator | Chi-square (CMIN) | CMIN/df | RMR | GFI | NFI | RFI | IFI | TLI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|---|---|---|
| Value | 272.562 at (df=162) | 1.682 | 0.023 | 0.902 | 0.787 | 0.750 | 0.901 | 0.881 | 0.899 | 0.055 |
| Ideal range for the indicator | Not significant | Less than 5 | approaching zero | 0 to 1 | 0 to > 1 | 0 to > 1 | 0 to > 1 | 0 to > 1 | 0 to 1 | Less than 0.08 |

Table 6 shows that the values of the fit indices were within an acceptable range for goodness of fit; the value of the ratio index between $X^2$ and degrees of freedom (CMIN/do) was 1.682, which is a good value that falls within the ideal range. RMR is 0.023, a value that is nearly zero. The GFI, CFI, NFI, RFI, IFI, and TLI indices had acceptable values that were close to 1.00, which are 0.902, 0.899, 0.787, 0.750, 0.901, and 0.881. The model is considered acceptable as the RMSEA value was 0.055, which is less than 0.08.

*6.2.2.2. Reliability of Creative Self-Efficacy Scale*

Cranach's alpha and omega coefficients for the dimensions and total degree were used to confirm the scale's reliability. The scale's high degree of reliability is indicated by the calculated Cronbach's (α) and omega (ω) coefficients, which were 0.827-0.826 for CSECT, 0.729-0.714 for CSECP, and 0.857-0.852 for the whole scale.

## 7. Results

*RQ1:* Are there differences in psychological fitness among academically gifted university students based on gender and academic specialization?

The sample members' responses on the PF scale were analyzed by gender and academic specialty to determine the means and standard deviations.

**Table 7.**
Means and standard deviations of study participants' PF scale responses by gender and academic specialization.

| Gender | Academic specialization | Sample size (N) | Mean | Std. |
|---|---|---|---|---|
| Male | Scientific | 72 | 113.69 | 16.040 |
| | Humanitarian | 91 | 111.27 | 17.607 |
| | Total | 163 | 112.34 | 16.924 |
| Female | Scientific | 86 | 124.67 | 13.362 |
| | Humanitarian | 131 | 125.40 | 14.109 |
| | Total | 217 | 125.11 | 13.791 |
| Total | Scientific | 158 | 119.67 | 15.592 |
| | Humanitarian | 222 | 119.61 | 17.082 |
| | Total | 380 | 119.63 | 16.458 |

A two-way ANOVA was utilized to demonstrate the differences in the average responses of the study participants on the PF scale based on academic specialization and gender.

**Table 8.**
Results of a two-way ANOVA for the responses on the PF scale according to gender and academic specialization.

| Source | Type III Sum of Squares | Df. | Mean Square | F-value | Sig. |
|---|---|---|---|---|---|
| Gender | 14275.688 | 1 | 14275.688 | 61.539 | 0.000 |
| Specialization | 65.258 | 1 | 65.258 | 0.281 | 0.596 |
| Gender * Specialization | 223.694 | 1 | 223.694 | 0.964 | 0.327 |
| Error | 87223.652 | 376 | 231.978 | | |
| Total | 5541349.000 | 380 | | | |
| Corrected Total | 102658.155 | 379 | | | |

Table 8 shows that there are statistically significant differences at (0.001) between the average scores of academically gifted male and female university students on the PF scale, in favor of females. The findings also indicate that there are no significant differences in PF based on academic specialization or the binary interaction between gender and academic specialization.

*RQ2:* Are there differences in creative self-efficacy among academically gifted university students based on gender and academic specialization?

Table 9 displays the means and standard deviations of the study participants' responses on the creative self-efficacy scale, broken down by gender and academic specialization.

**Table 9.**
Means and standard deviations of the study sample participants' responses on the CSE scale by academic specialization and gender.

| Gender | Academic specialization | Sample size (N) | Mean | Std. deviation |
|---|---|---|---|---|
| Male | Scientific | 72 | 47.42 | 7.300 |
| | Humanitarian | 91 | 46.87 | 7.258 |
| | Total | 163 | 47.11 | 7.259 |
| Female | Scientific | 86 | 50.22 | 5.234 |
| | Humanitarian | 131 | 50.69 | 5.965 |
| | Total | 217 | 50.50 | 5.679 |
| Total | Scientific | 158 | 48.94 | 6.395 |
| | Humanitarian | 222 | 49.12 | 6.777 |
| | Total | 380 | 49.05 | 6.613 |

A two-way ANOVA was employed to determine how the mean responses of the study participants on the CSE scale varied by gender and academic specialization.

**Table 10.**
Findings from a two-way ANOVA of research sample participants' responses on the CSE scale by academic specialization and gender.

| Source | Type III sum of squares | Df. | Mean square | F-value | Sig. |
|---|---|---|---|---|---|
| Gender | 993.810 | 1 | 993.810 | 24.141 | 0.000 |
| Specialization | 0.154 | 1 | 0.154 | 0.004 | 0.951 |
| Gender * Specialization | 23.323 | 1 | 23.323 | 0.567 | 0.452 |
| Error | 15478.888 | 376 | 41.167 | | |
| Total | 930718.000 | 380 | | | |
| Corrected Total | 16573.147 | 379 | | | |

Table 10 shows that there are statistically significant differences at (0.001) between the average scores of academically gifted male and female university students on the CSE scale, in favor of females. The findings also indicate that there are no differences in the study participants' responses on the CSE scale based on academic specialization or the interaction between gender and academic specialization.

*RQ3:* Is there a statistically significant relationship between psychological fitness and creative self-efficacy among academically gifted university students?

The Pearson correlation coefficient between the PF and CSE scales and their subdimensions was calculated to provide an answer to this question.

**Table 11.**
PF and CSE scales' Pearson correlation coefficient.

| Variables | Creative self-efficacy in creative thinking | Creative self-efficacy in creative performance | Total score of CSE scale |
|---|---|---|---|
| Competence of coping with stress | 0.533** | 0.512** | 0.579** |
| Persistence | 0.442** | 0.537** | 0.534** |
| Emotion management | 0.377** | 0.426** | 0.440** |
| Achievement motivation | 0.496** | 0.490** | 0.545** |
| Total score of PF scale | 0.566** | 0.597** | 0.640** |

**Note:** ** Significant at level 0.01.

Table 11 shows that the values of the correlation coefficients ranged between 0.377** and 0.640**, which are positive and statistically significant at the 0.01 level. This indicates that there are positive and significant correlations at the 0.01 level between the scores of academically gifted university students on the PF scale and its sub-dimensions (competence in coping with stress, persistence, emotion management, and achievement motivation), as well as the CSE scale and its sub-dimensions (creative self-efficacy in creative thinking and creative self-efficacy in creative performance).

## 8. Discussion

The results of this study provide important insights into the relationships between PF and CSE in academically gifted university students. Regarding the gender and academic specialization differences in PF, the study revealed statistically significant gender differences in PF for female academically gifted students. This may be related to family support for females more than for males. These results are consistent with those of Al-Hayani [24], who found that there are differences in PF

between males and females in favor of females. In contrast, the research conducted by Ahmed and Dabash [25] and Hbash [27] revealed no gender-based differences in PF. The higher PF observed in female students underscores the need for gender-sensitive approaches in mental health and educational interventions to support all students effectively. This result is supported by the study of Salovey and Mayer [54], which revealed that emotional intelligence and the ability to regulate emotions positively influence psychological well-being, which was found to be more developed in females. Interestingly, no differences were found based on academic specialization or the interaction between gender and specialization; this aligns with the research findings of Ahmed and Dabash [25] and Hbash [27]. This suggests that PF is a more intrinsic construct, potentially influenced by personal factors rather than academic specialization.

Regarding the gender and academic specialization differences in CSE, similarly, females demonstrated significantly higher levels of CSE compared to males, emphasizing their confidence in generating innovative solutions and applying creative abilities. This contradicts the findings of research by Gong, et al. [55] and Beghetto [56], which indicated a weak correlation between CSE and gender. While studies by Al-Rababah [50]; Schack [57]; Alkhateeb [58] and Al-Dhaimat, et al. [59] did not find a statistically significant effect of gender on CSE, [60] found that males and females differed significantly in how they expressed their creativity. These results align with Puozzo and Audrin [8] research, which highlights that female students often express greater confidence in creative thinking and problem-solving due to their ability to synthesize emotional and cognitive processes. These attributes may enable them to tackle challenges innovatively, reinforcing their CSE. This was also supported by the study of Othmas [48] and Al-Qudah [49], which indicated that there were differences in CSE in favor of females.

However, no differences were observed due to academic specialization or the interaction between gender and specialization. This suggests that CSE, like PF, may be shaped by broader psychological and social influences rather than domain-specific factors. These findings are consistent with the findings of Ali [47] and Othmas [48], while these results contradicted the study by Aljumaili and ALmajmaie [61], which indicated that the variable of specialization had significant differences in CSE favoring scientific specialization.

Regarding the relationship between PF and CSE, a strong positive relationship was found between PF and CSE, with significant associations across all sub-dimensions. Many studies have highlighted the importance of satisfying psychological needs in the academic environment. Researchers have found that when students' psychological needs, such as autonomy, competence, and relatedness, are met within the learning environment, it can lead to increased academic motivation, satisfaction with their studies, and certainty about their educational choices [62]. According to Al-Hayani [24], university students' motivation for academic achievement and their PF level were positively correlated. It was found that students with a high level of PF tend to achieve better academic results. When students are psychologically healthy and resilient, they are better able to engage in risk-taking and innovation, which are essential components of creativity. Stress, anxiety, and poor mental health can disrupt cognitive processes, impairing the ability to engage in deep and creative thinking [63].

The results of the studies by Adams-Byers, et al. [64]; Clinkenbeard [65] and Cramond and Martin [66] also showed that feelings of neglect, marginalization, and rejection by their teachers or peers restrict creativity and limit the outcomes of creativity and creative expression, so they need an appropriate level of PF to face these conditions. This finding aligns with Han [11], who emphasized the critical role of psychological well-being in fostering creativity and innovation. Similarly, persistence and achievement motivation, which were strongly linked to CSE in this study, reinforce the conclusions of Meinel, et al. [9] that sustained effort and goal orientation are essential for creative success. According to Diliello, et al. [67], CSE is the belief in one's own capacity to generate novel and useful ideas. It involves self-assessment of one's capacity for creativity, problem-solving, and idea generation. These abilities require PF to activate them. Several studies have shown positive correlations between some indicators of PF (such as happiness, self-confidence, life satisfaction, optimism, openness to experiences, level of ambition, self-esteem, self-management, emotional intelligence, and thinking styles) and CSE [19-21, 28, 31, 42, 43, 45, 51, 68, 69]. CSE showed a good correlation with both achievement motivation and emotion management, underscoring the importance of goal orientation and emotional control in promoting creativity. These findings imply that improving PF can directly raise gifted students' CSE, hence fostering their academic and personal development.

## 9. Conclusion

This study underscores the critical role of PF and CSE in the development of academically gifted university students. Female students demonstrated higher levels of both constructs, indicating potential gender-based differences that warrant further exploration. The absence of significant effects due to academic specialization suggests the universal relevance of these psychological constructs across fields of study. The strong positive relationship between PF and CSE highlights the necessity of integrated support systems in educational settings. Interventions that bolster PF—through stress management, persistence, emotional regulation, and achievement motivation—can have a profound impact on students' creative capabilities and overall well-being.

By integrating these insights into psychological and educational programs, institutions can empower academically gifted students to achieve their full potential while maintaining resilience and emotional stability. These efforts are essential for fostering a generation of innovative leaders capable of navigating complex challenges and contributing meaningfully to society.

## 10. Implications

The implications of this study call for a holistic approach to supporting the psychological and creative development of academically gifted students. By incorporating these findings into educational and mental health frameworks, institutions can better equip gifted students to thrive in both their academic pursuits and personal lives, ensuring their continued growth as

future leaders and innovators. To develop psychological fitness (PF) and creative self-efficacy (CSE), teachers and counselors must adopt a holistic approach. Providing support for mental health, such as stress management workshops, mindfulness training, and access to therapy, can help gifted students build resilience and maintain emotional well-being. Furthermore, creating a supportive and flexible academic environment that values creativity and innovation will encourage students to challenge themselves and take intellectual risks without fear of failure.

## 11. Limitations

The current study has limitations that deserve to be stated and considered in future research.

- Sample limitations: The study was restricted to a sample of academically gifted students from Helwan University.
- Methodology: The research utilized a descriptive approach, which limits the ability to infer causal relationships between PF and CSE.
- Studied variables: The study focused on a limited number of variables, such as gender and academic specialization.
- Measurement tools: reliance on the PF scale and CSE scale.

**List of Abbreviations:**

- Psychological fitness (PF).
- Creative self-efficacy (CSE).
- Competence in coping with stress (CCS).
- Persistence (PRS), emotional management (EM).
- Achievement motivation (AM).
- Creative self-efficacy in creative thinking (CSECT).
- Creative self-efficacy in creative performance (CSECP).

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