

Development and validation of the educational psychological capital scale

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Article Info

Article history:

Received Jan 6, 2023

Revised Sep 11, 2023

Accepted Oct 13, 2023

Keywords:

Education

Psychological capital

Psychometric

Scale development

Validation

ABSTRACT

Since the introduction of psychological capital to the field of education, it has drawn a lot of interest from researchers. This is due to the numerous studies that have demonstrated the positive effects of psychological capital on academic performance. Nevertheless, the psychological capital scale was initially developed to measure the psychological capital of employees, not students. There is a dearth of studies that examine the psychological capital scale's psychometric properties in educational contexts, particularly in Southeast Asia. Therefore, the present study aims to develop and test the validity of an educational psychological capital scale. The study was carried out with the participation of a total of 2,494 undergraduates. The tests of indicator reliability, construct reliability convergent, validity, and discriminant validity were executed. The result revealed that the scale demonstrated satisfactory psychometric properties. The study also found psychological capital can serve as a positive predictor of student academic performance. It signified that the scale can be used to measure student psychological capital precisely. This has resolved the flaw of the original psychological capital scale, which measured students' psychological capital in the workplace rather than in educational settings. However, since the study was conducted in Malaysia, the psychometric properties of the scale can be further verified in other countries.

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1. INTRODUCTION

Higher education is vital in producing a group of individuals to adapt to this rapidly evolving world with innovative solutions. The students will be educated with the knowledge and skills needed to navigate complex challenges and contribute to society's advancement. In Malaysia, education continues to be prioritized by the government, with a total allocation of RM55.2 billion allocated for education development in 2023 [1] with a goal to produce high-quality graduates. Unfortunately, studies have found that students' academic performance tends to be negatively affected by poor mental health, such as stress [2], depression, anxiety [3], and life dissatisfaction [4]. It is concerning that approximately 30% of individuals in Malaysia aged 16 and above struggle with mental health problems [5]. In comparison to university students in the United Kingdom, it was observed that Malaysian university students displayed greater levels of stress, anxiety, and depression [6].

However, it is fortunate that a number of empirical studies have discovered that mental health issues among university students can be mitigated by psychological capital. For instance, a study has evidently shown students' stress intensity diminishing after attending 4 weeks of 75-90 minutes of psychological capital interventions [7]. Besides that, a study involved with 827 university students also found that psychological capital was a mediator between stress and well-being. In other words, the student's stress level can be reduced by enhancing the student's psychological capital level, subsequently contributing to a positive effect on the student's well-being [8].

Psychological capital also has been found that play a key role in alleviating depressive symptoms. A study conducted in China that involved a sample of 2,554 postgraduate students revealed that depressive symptoms were negatively associated with psychological capital [9]. It posited that students with a low level of depressive symptoms tend to have a high level of psychological capital. Besides that, a study involved with 1,267 college students also found that positive psychological capital moderated the relationship between perceived stress and depression [10]. In other words, it signified that an increase in psychological capital levels among students may serve as a protective factor against an outbreak of depression, thereby mitigating the potential negative consequences of high-stress levels.

Besides that, it is also evident that undergraduate students' feelings of anxiety tend to reduce while their psychological capital level is boosted. A study conducted with 321 graduate nursing students found that increasing the level of positive psychological capital was likely to decrease anxiety levels [11]. Besides that, psychological capital was found to be a mediator between anxiety and academic adjustment in a study involving 250 university students [12]. It signified that the student's anxiety level can be reduced by enhancing the student's psychological capital level, subsequently leading to a positive academic adjustment. In sum, it concludes that psychological capital is playing a vital role in fostering students' overall mental health and well-being, which we shall highlight on it.

In 2004, the two psychologists Luthans and Youssef introduced the concept of psychological capital, which is composed of the four desired psychological state-like resources namely hope, optimism, efficacy, and resilience [13]. It was manifest who you are, what you believe you can do, what you do, and who you are capable of becoming [14]. In brief, psychological capital reflects the manners an individual engages in actions and processes thoughts [15].

Since the introduction of psychological capital to the field of education, it has received it has garnered significant interest and attention due to the positive and promising results it has yielded. Researchers have found that with the presence of psychological capital, a wide range of academically desirable outcomes (e.g., academic motivation, academic performance, engagement, subjective well-being, and positive mental health) have been improved significantly [16]–[20] whereas academic undesirable outcomes (e.g., learning burnout, anxiety, and depression) have been reduced [21]–[23]. The student who obtained high scores in psychological capital was characterized to possess high optimism, resilience, hope and self-efficacy, to succeed academically. In specific, it refers to a student who: i) has the self-confidence and willingness to exert the required effort to accomplish the difficult tasks (e.g. assignment, project, and final year project) given by the lecturers; ii) optimistic in his/her efforts to succeed both now and in the future; iii) continue to strive toward academic goals despite obstacles, when required, alter paths to achieve these goals in order to succeed; and iv) when confronted with difficulties, maintains a positive attitude, and push himself/herself even further to achieve the academic goals. It is evident that university students with high self-efficacy perform better academically [24]–[26]. Studies also found that optimism and hope are positively related to academic performance [27]–[29]. Moreover, a plethora of studies have consistently demonstrated a statistically significant positive correlation between resilience and academic achievement [30]–[32]. Hence, it is indisputable that university students who are characterized with high levels of psychological capital (self-efficacy, optimism, hope, and resilience) tend to perform better academically.

The broaden-and-build theory developed by Fredrickson in years 2004 can be applied to explain the phenomenon [33]. As indicated in the theory, "positive emotions broaden an individual's momentary thought-action repertoire" [34]. This means that the presence of a positive state known as psychological capital has the effect of expanding an individual's ability to perform at their best, not just in the present moment, but also in terms of facilitating the growth of their personal resources. In other words, students with high levels of psychological capital tend to achieve academic success.

Although previous studies have reported that psychological capital contributes to better academic performance, it is important to note that the initially developed psychological capital questionnaire (PCQ) was to measure the psychological capital of employees, not students [35]. This raises concerns about potential misinterpretation when applying the scale to measure psychological capital among students. The items included in the scale may not accurately capture the psychological capital of university students. For instance, items such as "I feel confident contacting people outside the company (e.g., suppliers, customers) to discuss problems" and "I feel confident in representing my work area in meetings with management" may not be suitable for assessing psychological capital among university students.

Studies that focus on assessing the psychometric properties of the psychological capital scale in educational settings are scarce [36] especially in Southeast Asia, except for the study that has been done by King and Caleon in the year 2021 [37]. However, the psychological capital scale was developed using secondary students between the ages of 13 and 14, which may not accurately reflect university students. This is because the learning environments for secondary school and university students are different. In light of this, it is imperative that we develop a scale for measuring psychological capital among undergraduates.

2. RESEARCH METHOD

2.1. Research procedure

The educational psychological capital scale was developed according to the six steps scale development procedure as presented in Figure 1. The scale development procedure was adapted from typical procedures of scale development [37]–[40]. In step 1, the delineation of conceptual definitions for the constructs was conducted. It is crucial to develop precise conceptual definitions for each construct to capture university students' psychological capital effectively before generating items. In this step, the conceptual definitions for the existing four constructs were re-delineated to tailor to an education setting. This is because, the psychological capital scale was initially developed to measure the psychological capital of employees, not students. Thus, the original conceptual definitions were unable to reflect the educational setting comprehensively. In step 2, 15 items were generated based on the conceptual definitions of psychological capital from an educational setting.

The third stage, which followed step two, was the validation of content. In this phase, subject matter experts reviewed all of the constructs and items generated in step 2. In this step, the experts evaluated the relevance of each item to represent the constructs and the clarity and conciseness of the items. As per the recommendations of the subject matter experts, three items with ambiguous attributes have been omitted from the list. There were 10 students participated in the pre-test in step 4 to ensure that the items can be understood as intended by the researchers to measure without ambiguity [41]. In step 5, a pilot test was carried out with 382 students. The result showed that the scale is reliable and valid to be used. Due to the positive results observed in the pilot test, a cross-sectional study was conducted further to evaluate the psychometric characteristics of the scale in the sixth phase with 2,494 students at a single point in time.

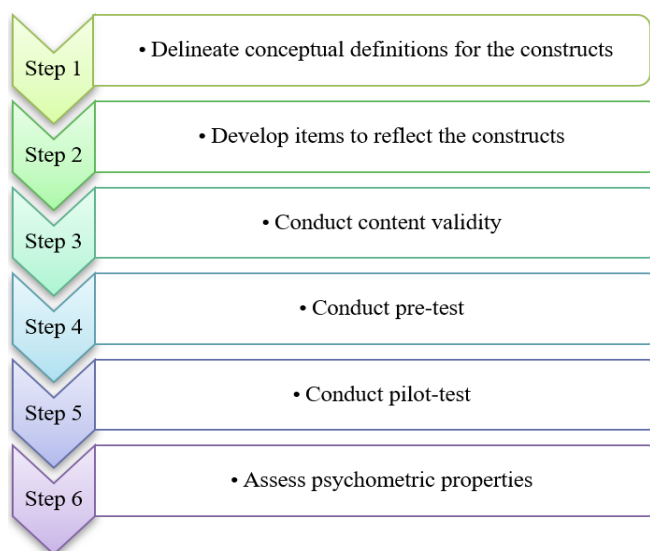


Figure 1. Overview of the educational psychological capital scale development procedure

2.2. Participants

The pilot study included the involvement of 382 undergraduates enrolled at Wawasan Open University in Malaysia. Table 1 contains details of the participants' demographics, which were gathered during the pilot test. 58% of the participants were women, while 42% were men out of the total of 382. The mean age and grade point average (GPA) were 36 years and 2.95, respectively.

Table 1. The demographic profile of participants

Variable	Frequency	Percentage	Mean
Gender			
Male	161	42	
Female	221	58	
Age			36
GPA			2.95

The actual test had the participation of 2,949 students from Wawasan Open University, located in Malaysia. Table 2 contains details about the participants' demographics, which were gathered during the actual test. As stated in Table 2, 66.5% of the participants were women, while 33.5% were men. The mean age and cumulative grade points average (CGPA) were 33 years and 2.90, respectively. All of the students taking part in this study are students who have been in the university for at least one semester.

Table 2. The demographic profile of participants

Variable	Frequency	Percentage	Mean
Gender			
Male	987	33.5	
Female	1,507	66.5	
Age			33
CGPA			2.90

3. RESULTS

3.1. Pilot test

To identify the number of potential factors underlying the educational psychological capital scale, exploratory factor analysis has been conducted using SPSS version 28 in the pilot test. 382 students participated in the pilot test. The analysis revealed that the four factors' eigenvalue >1 (self-efficacy 3.231, hope 2.603, optimism 2.013, and resilience 1.640). It signified that there are four factors in the educational psychological capital scale, which is in accordance with our postulation. Besides that, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test have been employed to assess the factorability of the scale. The results showed that the KMO value is 0.923 and Bartlett's test is significant ($p < 0.001$), which met the requirement set by Pallant [42] that KMO has to be ≥ 0.6 and the P-value for Bartlett's test has to be ≤ 0.05 .

3.2. Actual test

In the actual test, WrapPLS 6.0 was employed to examine the psychometric properties of the educational psychological capital scale. A total of 2,494 respondents participated in the actual test. Indicator reliability and construct reliability analysis were run by us to examine the reliability of the scale. Individual item loading was assessed based on their respective constructs in indicator reliability analysis. The analysis found that the loadings of all the items were above the suggested threshold of 0.5 [43], which falls within the range of 0.630 to 0.869. In construct reliability analysis, the composite reliability was examined. The analysis also showed that all the constructs' composite reliabilities fall within the range of 0.817 to 0.875 which met the minimum requirement of ≥ 0.7 [43]. In sum, the reliability of the newly developed educational psychological capital is adequate. The details of the results are presented in Table 3.

Convergent validity and discriminant validity were performed to measure the validity of the scale. As recommended by Hair *et al.* [44], the convergent validity of the scale was examined using the value of average variance extracted (AVE). The result showed that all the AVE values met the recommended requirement of ≥ 0.5 [43], which falls within the range of 0.616 to 0.700. Besides that, based on the obtained results, it also indicated that the scale does not encounter collinearity issues as the VIF values were below the minimum set threshold of 3.3 [43]. The detailed results are presented in Table 4.

Furthermore, we also ran a discriminant validity test to examine the scale's validity as shown in the Table 5. The analysis findings indicate that the square roots of the AVE for all constructs, as denoted by the bolded values on the diagonal, exceed the off-diagonal elements inside their respective rows and columns. The aforementioned condition, as defined by Hair *et al.* [44], necessitates that the square roots of the AVE for each construct should exceed the maximum correlation value observed between that construct and all other constructs. In other words, the obtained results proved that the scale is valid to be used in educational settings.

Table 3. The reliability of the educational psychological capital scale

	Construct	Loadings	Composite reliability
Self-efficacy has the self-confidence and willingness to exert the required effort to accomplish the difficult tasks (e.g., assignment, project, and final year project) given by the lecturers.	I believe I can complete all the courses in my academic program as registered.	0.819	0.860
	I am confident to be able to submit all my assignments on time.	0.834	
	I am confident in my ability to study the course materials on my own.	0.805	
Hope optimistic in his/her efforts to succeed both now and in the future.	I am determined to complete my studies despite facing difficulties in life.	0.800	0.875
	I find solutions when I encounter difficulties in my studies.	0.869	
	I find ways to improve my academic performance when my result is below expectations.	0.840	
Optimism continues to strive toward academic goals despite obstacles and, when necessary, is willing to adjust their approach to achieve success.	I usually have positive thoughts.	0.630	0.825
	I can be successful in my studies.	0.849	
	I can manage my studies well.	0.854	
Resilience when confronted with difficulties, maintains a positive attitude, and push himself/herself even further to achieve the academic goals	I can manage my personal issues while pursuing my studies.	0.789	0.817
	I can study on my own even without feedback from my lecturer.	0.672	
	I can complete my assignments even though I am facing difficulties.	0.852	

Table 4. The convergent validity of the educational psychological capital scale

Construct	AVE	Full Collinearity (VIF)
Self-efficacy	0.671	2.256
Hope	0.700	2.122
Optimism	0.616	2.239
Resilience	0.684	2.219

Table 5. The discriminant validity of the educational psychological capital scale

	Optimism	Resilience	Hope	Self-efficacy
Optimism	0.785*			
Resilience	0.600	0.775*		
Hope	0.589	0.550	0.837*	
Self-efficacy	0.615	0.611	0.640	0.819*

Note: *Square root of the AVE value on the diagonal

To further establish concurrent and incremental validity of the scale, regression analysis was performed to test the association between educational psychological capital and the academic performance of the students. In this study, the grade points average (GPA) provided by the university was used to measure students' academic performance. The study found that psychological capital is positively related to academic performance with path coefficient and effect size at 0.160 and 0.025 respectively as presented in Table 6.

Table 6. Psychological capital and academic performance

	Path coefficients	p-value	Effect size
Psychological capital is positively related to university students' academic performance.	0.160	P<.001	0.025

4. DISCUSSION

Psychological capital is an individual positive mental state that has evidently benefited university students' academic performance, engagement, and subjective well-being [17]–[19]. Studies also proved that by increasing students' psychological capital levels, their learning burnout, anxiety, and depression would likely decrease [21]–[23]. It contributes a substantial role to students' overall performance and well-being. Nevertheless, it is worth noting that the initial development of the psychological capital questionnaire was conducted within the workplace rather than in an educational setting. A number of the studies [23], [45]–[48] employed the psychological capital questionnaire that was not meant to measure students' psychological

capital which may lead to misinterpretation. To assess students' psychological capital precisely, this study indicates the initial attempt to develop an educational psychological capital.

The concept of psychological capital was introduced for the first time in 2004 with four constructs [13]. The results of the present study supported the notion that educational psychological capital can be divided into four different constructs (resilience, hope, self-efficacy, and optimism), which are in accordance with the original workplace psychological capital scale [14]. Particularly, the 12 items of educational psychological capital can be further subdivided to precisely measure the four constructs. In other words, apart from assessing the level of psychological capital, the scale can be used to identify the antecedent factors that contribute to the development of psychological capital.

Overall, the 12-item educational psychological capital scale demonstrated favorable reliability results in both indicator reliability and construct reliability analysis. The loading values exceeded 0.63, indicating that all the items had high correlations with the underlying construct. Additionally, the composite reliability scores surpassed 0.82, indicating high internal consistency of the scale.

Besides that, the 12-item educational psychological capital scale also demonstrated good validity in both convergent and discriminant validity tests with AVE values exceeding 0.62 and VIF values falling below 2.20. Furthermore, a positive association was found between psychological capital and academic performance in this study. In other words, students with high levels of psychological capital tend to perform better academically, which is in line with the fundamental concept of the Broaden-and-Build Theory. In essence, students who score high in psychological capital are likely to broaden their personal resources to perform at an optimal level and thus attain academic success. The findings are in line with the literature [17], [45], [49] and offer evidence for the concurrent and predictive validity of the educational psychological capital scale.

Despite the encouraging results found in this study. It is important to take note that there are some shortcomings in this study that have opened new avenues for future research. Firstly, the participants of the study were Malaysian students studying at an online distance-learning university. To examine the psychometric properties of the scale further, studies are encouraged to be carried out involving students from on-campus study universities or students from other countries. Secondly, the researchers in the present study only examined the relation of psychological capital and students' grade points average. It is suggested that the newly developed educational psychological capital scale be used to study the benefited impact of psychological capital on other variables such as online learning effectiveness [50], academic motivation, engagement, subjective well-being, positive mental health, learning burnout, anxiety, and depression. Thirdly, the current scale only has four constructs, which are not meant to represent an exhaustive list of psychological capital [14]. Therefore, it is recommended that future researchers expand the scale by including additional possible constructs to measure students' psychological capital. Lastly, this is a cross-sectional study in nature limiting its ability to determine causality. Therefore, future researchers are also encouraged to study the positive effect of psychological capital on students' academic performance using an experimental study by developing a psychological capital intervention that is meant for university students.

5. CONCLUSION

In conclusion, the objective of developing a scale to measure the psychological capital of university students that demonstrates satisfactory psychometric properties has been met. An educational psychological capital scale with 12 items was developed and validated by 2,494 university students in Malaysia. It is essential to develop a psychological capital scale in an educational setting. This is because, although many studies have found that psychological capital bolsters academic performance, there is a lack of scale available solely to measure university students' psychological capital, especially in Southeast Asia. We hope that by developing an educational psychological capital scale, future assessments of students' psychological capital will be more precise. Conclusively, this study has come to the conclusion that the newly developed educational psychological capital scale is a valid and reliable tool to measure students' psychological capital.

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