The Effect of Positive Psychology Interventions on Learning Engagement and Self-efficacy of China Higher Vocational Students

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Abstract

This study examines the effects of positive psychology interventions on the learning engagement and self-efficacy of vocational college students. A single-group pretest-posttest experimental design was employed, involving 86 first-year students from a vocational college. The interventions, implemented in a classroom setting, included gratitude exercises, strengths-based interventions, and Three Good Things practice, among others. The effectiveness of the interventions were statistically evaluated using pretest-posttest assessments, analysis of variance (ANOVA). The results indicated that the positive psychology intervention significantly enhanced students' self-efficacy ($p < .001$), whereas the improvement in learning engagement was not statistically significant ($p > .05$). The lack of significant improvement in learning engagement may be due to the short duration of the intervention and multiple factors influencing learning engagement. Learning engagement requires a comprehensive approach to improvement. Interventions have increased students' psychological resources - self-efficacy–but it is not sufficient to directly change learning behavior. These findings provide insight into the development of more effective psychological support strategies for vocational education.

Keywords: positive psychology intervention, vocational students, learning engagement, self-efficacy, vocational education

1. Introduction

Vocational education plays a crucial role in cultivating technical and skilled professionals. In the past decade, China's vocational education has experienced rapid development and achieved certain successes, yet some challenges remain. Vocational education has historically been seen as a less prestigious path compared to general academic education, often chosen by students with lower academic scores (Ling, 2015). Vocational students in China often come from secondary vocational schools or are high school graduates who do not meet the entry requirements of traditional universities. This group of students faces greater academic difficulties owing to their weaker foundational skills (Ling, 2015). Studies show that over 70% of vocational students perform below the national academic average, exacerbating their self-doubt and academic pressure (Cao & Han, 2024; Shuijing & Mohamad Nasri, 2024). Students in higher vocational institutions remain in a relatively disadvantaged position and face challenges such as academic difficulties, psychological pressure, and issues related to social recognition (Xu et al., 2024). Chinese vocational students generally have low levels of engagement in their studies (Cao & Han, 2024). Many students have low self-efficacy, often accompanied by feelings of helplessness and inferiority, which negatively affects their academic performance and confidence in career planning (Zeng et al., 2022; Hasim et al., 2023). Thus, enhancing learning engagement and self-efficacy among vocational students has become a critical research topic in vocational education.

Positive psychology provides a new perspective for addressing this issue. It focuses on studying individuals' strengths and developmental pathways, emphasizing interventions that enhance well-being, resilience, and positive learning experiences (Seligman & Csikszentmihalyi, 2000a). The PERMA model, which includes positive emotions, engagement, relationships, meaning, and accomplishment, has been widely applied in educational settings. Research

suggests that this model effectively promotes student learning engagement and academic achievement (Seligman, 2011). Furthermore, positive psychology interventions (PPIs) have demonstrated effectiveness in enhancing positive emotions, confidence, and proactive attitudes toward work and learning among undergraduate students and corporate employees (Luthans, 2002). However, empirical studies focusing specifically on vocational students remain limited, and the mechanisms by which PPIs influence this group are not yet fully understood.

Therefore, this study aimed to examine the effects of classroom-based positive psychology interventions on learning engagement and self-efficacy among vocational students. Through empirical investigation, this study seeks to determine whether PPIs can effectively enhance vocational students' motivation for learning and provide theoretical and practical insights for implementing psychological interventions in vocational education.

2. Research Background

2.1 Background of Positive Psychology

Positive psychology, an emerging field in psychology, is dedicated to studying human strengths and developmental pathways. Seligman (2000) proposed that positive psychology aims to shift the focus from the negative aspects of life to promoting positive development. In recent years, the application of positive psychology in education has increased, particularly in terms of enhancing students' learning motivation and mental health. For example, group counseling based on the PERMA model has been shown to effectively improve vocational students' self-efficacy (Seligman & Csikszentmihalyi, 2000b).

The PERMA model consists of five core elements: positive emotions, engagement, relationships, meaning, and accomplishment. In educational settings, Positive Emotion refers to the pleasant emotions students experience during learning; engagement represents the degree of focus and absorption in learning activities; relationships emphasize positive interactions between students, peers, and teachers; meaning pertains to students' recognition of learning goals and values; and accomplishment concerns students' sense of success in academic achievement.

Chinese scholars have begun to explore the application of positive psychology in education. For instance, the Center for Positive Psychology Research at Tsinghua University's School of Social Sciences proposed a Core Model of Positive Education. This model incorporates successful global practices in positive education while considering the characteristics of Chinese students. It emphasizes integrating positive self-concept, positive emotions, and positive engagement in education to comprehensively enhance students' psychological well-being and academic performance (Tsinghua University, 2021).

2.2 The Current Situation of Learning Engagement and Self-Efficacy of Higher Vocational Students

In terms of academic engagement, Chinese vocational students generally have low levels of engagement in their studies (Cao & Han, 2024). Many students aim only to pass their courses rather than excel, showing minimal proactive engagement in their studies, which is exacerbated by a weak academic foundation and lack of confidence (Shuijing & Mohamad Nasri, 2024). Low motivation for learning, coupled with negative social stereotypes about vocational students, leads to a passive attitude towards academics, resulting in poor outcomes and feelings of inferiority (Huang et al., 2023; Xie & Xiao, 2024). Additionally, a lack of effective learning strategies contributes to widespread burnout and high dropout rates (Tang & Osman, 2023; Yi et al., 2015).

Self-efficacy is another critical issue affecting vocational students, particularly in academic and career decision making. Many students have low self-efficacy, often accompanied by feelings of helplessness and inferiority, which negatively affects their academic performance and confidence in career planning (Zeng et al., 2022; Hasim et al., 2023). These challenges are further compounded by an unclear career identity, where students choose their majors based on external pressures rather than personal interests, further eroding their self-worth (Hasim et al., 2023). Compared to undergraduate students, vocational students tend to have a weaker academic self-identity.

A study of Chinese vocational students found that achievement goal orientation is closely related to academic performance, with mastery goals and performance-approach goals positively predicting academic success, while performance-avoidance goals showed no significant relationship with academic performance (Minwei & Amirrudin, 2023).

Moreover, vocational students tend to adopt passive learning strategies that lack initiative and self-regulation, leading to poor learning outcomes. From an environmental perspective, curriculum design and teaching methods in vocational education differ significantly from those of traditional higher education. Universities emphasize theoretical learning and academic research, whereas vocational education focuses more on practical skills and

hands-on training. However, some vocational institutions still follow an exam-oriented approach, neglecting students' interests and practical experiences and resulting in low student participate (Bardach et al., 2019).

Additionally, teacher-student interactions play a crucial role in learning engagement and self-efficacy (H. Zhang et al., 2024). Research has shown that, in highly supportive classroom environments, students are more likely to receive positive feedback, which enhances their confidence and self-efficacy (Zhou & Wu, 2023). However, in some vocational colleges, due to high teaching workloads, instructors may overlook students' individual needs, leading to a lack of emotional support and a sense of belonging, which further affects their learning engagement.

The learning engagement and self-efficacy of vocational students are influenced by multiple factors, including individual motivation, attribution styles, and learning strategies, as well as external factors, such as curriculum design, teacher-student interactions, and employment orientation (Tian & Hye, 2024). Addressing these issues and identifying effective intervention strategies to enhance vocational students' learning motivation and self-efficacy has become a critical focus of vocational education reform.

2.3 Current Status of Research on Positive Psychology Interventions

Based on existing research, positive psychology interventions (PPIs) mainly cover the following categories: Gratitude interventions, such as gratitude logs, gratitude letters, and gratitude visits, can enhance well-being and life satisfaction, reduce negative emotions, and improve social support and interpersonal quality(Emmons & McCullough, 2003; Seligman et al., 2005a). Strengths-based interventions, including strength assessment, goal setting, strength diaries, and feedback, can help improve self-esteem, self-confidence, and self-efficacy, as well as goal achievement and self-fulfillment (Dametto & Noronha, 2020; Seligman et al., 2005b). Three Good Things (TGT) encourages individuals to record three positive events that occurred in the past 24 hours and reflect on their causes; studies have shown that this approach is effective in reducing depressive symptoms and improving well-being, with an intervention effect lasting at least three months (Seligman et al., 2005). The Best Possible Self (BPS) helps individuals improve their sense of well-being and positive emotions, and enhances goal clarity and motivation to act by writing a daily narrative of their ideal future (King, 2001; Seligman et al., 2005b). Meditation of mindfulness involves breathing, focusing, body scanning, and mindful walking to improve emotional regulation, reduce stress, and enhance focus and resilience (Allen et al., 2021; Seligman et al., 2005b). Acts of kindness refer to helping others unconditionally, such as offering help or showing concern to strangers, promoting well-being and social connection, and enhancing empathy and prosocial behavior (Gherghel et al., 2021). Forgiveness Interventions can help reduce anger and negative emotions, and improve mental health and relationships by writing forgiveness letters and empathy exercises (Yun, 2018). Savoring emphasizes deliberately paying attention to and enjoying positive experiences in the present moment, such as slowly tasting food and enjoying beautiful views, to enhance positive emotions and prolong the duration of happiness experiences (Smith & Bryant, 2017). Optimistic Attribution Training guides individuals to make more positive attributions to failure and success, such as attributing failure to controllable factors rather than personal incompetence, to reduce learned helplessness and improve frustration resistance and self-efficacy (Eskandari et al., 2020). These interventions have shown significant mental health promotion effects in multiple empirical studies, thereby providing an effective way to improve individual well-being and mental resilience (Hendriks et al., 2020).

Existing studies have shown that positive psychology interventions have a positive effect on improving students' learning engagement and self-efficacy. PPIs guide students in setting personal goals, recognizing and applying their strengths, which enhances learning motivation and engagement, ultimately increasing self-efficacy and academic achievement (Proyer et al., 2013; Seligman, 2011). Tsinghua University has integrated a range of interventions into a 16-hour course. Students' post-test results on the dimensions of well-being, health, growth mindset, psychological resilience, school engagement, and school performance all improved to varying degrees compared to pre-test results (Tsinghua University, 2021).

Existing studies mainly focus on the effects of positive psychology interventions on well-being, emotion regulation, and social support, but there are few studies on the effects of learning engagement and self-efficacy among higher vocational students. Therefore, it is necessary to further explore how different positive psychology interventions can promote the Academic engagement and self-efficacy of higher vocational students to improve their academic performance and professional quality.

3. Research Methods

3.1 Study Design

In this study, a single-group pre-test and post-test experimental design was adopted, and 86 first-year students from a vocational college were selected as the research objects, which were randomly selected by class. This study explored the effects of positive psychology interventions on learning engagement and self-efficacy.

Intervention: The study intervention lasted for 12 weeks, with a 90-minute positive psychology session conducted once a week. Specific interventions are shown in Table 1.

Table 1. Interventions

Chapter	Theme	Intervention
One	Positive Emotion	Three Good Things
Two	Positive and Healthy	Physical and Mental Exercise
Three	Positive Emotion	Advantage Tree, Character Strengths
Four	Positive Emotion	Taste Practice
Five	Positive Engagement	Mindfulness Practice, Flow Practice
Six	Positive Relationship	Interpersonal Links, Gratitude Letter
Seven	Positive Relationship	Forgiveness, Gratitude
Eight	Positive Relationship	Active Responding
Nine	Positive Meaning	Share the 8-Week Goals
Ten	Positive Meaning	Helping Others
Eleven	Positive Achievements	Positive Self
Twelve	Positive Achievements	Achievement Recording

Teacher training: The teachers who participated in the course received four weeks of positive psychology intervention training, including theoretical learning and teaching simulation, to ensure that the intervention content was scientific and consistent.

3.2 Research Object

In this study, 86 first-year students from a vocational college were selected, including 46 male and 40 female students with an average age of 18.5 years.

Inclusion Criteria:

Full-time first-year students;

Voluntarily participate in the study and sign the informed consent form.

Exclusion Criteria:

Presence of serious mental health problems (e.g., diagnosed depression, anxiety)

Extremely low or high academic performance to avoid undue influence on outcomes;

Students who have received other psychological interventions within the past three months.

3.3 Research Tools

3.3.1 Utrecht Work Engagement Scale-Student, UWES-S

Schaufeli et al. (Schaufeli et al., 2002) developed the student version of the learning engagement scale, including three dimensions of vitality, concentration, and engagement, with a total of 17 questions, using a 7-point Likert scale, with a Cronbach's α coefficient of 0.89.

3.3.2 General Self-Efficacy Scale, GSE

The General Self-Efficacy Questionnaire developed by Schwarzer and Jerusalem (Johnston et al., 1995)was used, with a total of 10 questions and scored on a 4-point Likert scale, with a Cronbach's α coefficient of 0.87.

In this study, a pre-experiment was conducted with 50 vocational students before the formal measurement to calculate the reliability and validity of each scale. Cronbach's α coefficients were all greater than 0.80, indicating that

the scale had good internal consistency. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to confirm the construct validity of the scale.

3.4 Research Process

3.4.1 Pretest

Before the start of the study, the participants were given baseline measures of learning engagement and self-efficacy.

3.4.2 Intervention implementation

The study lasted for 12 weeks, and a positive psychology intervention course was conducted once a week, including a gratitude diary, advantage identification and application, and "three good-things exercises and so on. The curriculum is interactive and students are encouraged to share their experiences to enhance the effectiveness of the intervention.

3.4.3 Postest

After the intervention, the levels of learning engagement and self-efficacy were measured again.

3.5 Data Analysis

SPSS (version 26.0) was used for the data analysis. After collation, there were 73 valid questionnaires on learning engagement and 76 valid questionnaires on self-efficacy. The differences before and after the intervention were tested using a paired-sample t-test. Analysis of variance (ANOVA) was used to analyze differences between different groups.

The design of this study aims to ensure the validity of the experiment and the reliability of the results and to provide an empirical basis for the application of positive psychology intervention in higher vocational education.

4. Findings

4.1 Changes in Learning Engagement

This study employed a paired-samples t-test to analyze changes in students' academic engagement and its dimensions (vigor, dedication, and absorption) before and after a positive psychological intervention. The results（Table 2） showed that the total academic engagement scores before and after the intervention were 4.04 (SD = 1.23) and 3.99 (SD = 1.30), t(72) = 0.25, p = 0.79, respectively, which did not reach statistical significance. This indicated that short-term interventions did not significantly enhance students' academic engagement. Similarly, there were no significant differences between the pre-test and post-test scores in the three dimensions of vigor, dedication, and absorption ($p > 0.05$). Specifically, the mean pre-test score for vigor was 3.76, and the post-test score was 3.79 (t(72) = -0.13, p = 0.89); the mean pre-test score for dedication was 4.22, and the post-test score was 4.10 (t(72) = 0.7, p = 0.48); the mean pre-test score for absorption was 4.17, and the post-test score was 4.12 (t(72) = 0.28, p = 0.77). These findings suggest that the intervention did not significantly improve the students' academic engagement levels in the short term.

Table 2. T-test of Paired Samples of the Learning Engagement Scale

Pair		Mean	SD	SE Mean	t	df	One-tailed p	Two-tailed p
Pair 1	Pretest - Posttest	4.04 3.99	1.23 1.30	0.14 0.14	0.25	72	0.4	0.79
Pair 2	Vigor Pretest - Vigor Posttest	3.76 3.79	1.42 1.40	0.17 0.16	-0.13	72	0.49	0.89
Pair 3	Dedication Pretest - Dedication Posttest	4.22 4.10	1.19 1.29	0.14 0.15	0.7	72	0.24	0.48
Pair 4	Absorption Pretest - Absorption Posttest	4.17 4.12	1.32 1.36	0.15 0.16	0.28	72	0.39	0.77

This study further examined the effects of demographic variables, including gender, class, and family conditions, on academic engagement and its dimensions (vigor, dedication, and absorption) to determine whether the positive psychology intervention yielded differential effects across different groups（Table 3）.

4.1.1 Gender

In both the pretest and posttest, gender did not have a statistically significant effect on overall academic engagement (pretest, $p = 0.559$, posttest $p = 0.678$) or its dimensions (vigor, dedication, and absorption) ($p > 0.05$). This finding suggests that gender does not play a significant role in determining students' level of academic engagement. Furthermore, the effects of the positive psychology intervention did not differ significantly between male and female students, indicating that gender was not a moderating factor in the intervention's effectiveness of the interventions.

4.1.2 Class

In the pretest, the p-value for the effect of class on overall academic engagement was 0.08, and for vigor, it was 0.059, approaching the conventional threshold for statistical significance ($p < 0.05$). This suggests that the class may have had some influence on students' academic engagement; however, the effect did not reach statistical significance. In the posttest, p-values across all dimensions exceeded 0.05 (overall $p = 0.306$), indicating that the influence of class diminished following the intervention. This result may reflect initial differences in engagement levels across classes, which became less pronounced after the intervention, suggesting convergence in engagement levels among students from different classes.

4.1.3 Family Conditions

In the pretest, the p-values for family conditions in overall academic engagement ($p = 0.423$) and its dimensions were all greater than 0.05, indicating that family background did not significantly impact engagement levels. In the posttest, the p-values exhibited some variation, but remained statistically insignificant (overall $p = 0.186$), suggesting that the positive psychology intervention did not produce differential effects based on students' family conditions. This finding implies that students' socioeconomic background did not play a decisive role in shaping changes in their academic engagement.

Gender, class, and family conditions did not exert a statistically significant effect on academic engagement or dimensions in this study. Furthermore, the differences observed before and after the intervention were not statistically significant. These results suggest that the positive psychology intervention produced consistent effects across different student groups, with no significant moderating impact from demographic factors, such as gender, class, or family conditions.

Table 3. Difference Test of Demographic Variables in the Learning Engagement Scale

	Pretest p-value				Posttest p-value			
	Overall	Vigor	Dedication	Absorption	Overall	Vigor	Dedication	Absorption
Gender	0.559	0.522	0.705	0.568	0.678	0.568	0.909	0.828
Class	0.08	0.059	0.205	0.1	0.306	0.1	0.251	0.311
Family Conditions	0.423	0.249	0.486	0.723	0.186	0.723	0.308	0.274

In the pre-test data, the p-values of all control variables in relation to learning engagement were greater than 0.05, indicating that gender, class, and family situation did not have a significant impact on learning engagement before the intervention. The post-test results showed that gender had relatively high p-values in the dedication ($p = 0.909$) and absorption ($p = 0.828$) dimensions, suggesting that gender may have some influence on learning engagement after the intervention. However, overall, none of the variables reached significance ($p > 0.05$).

The lack of significant improvement in learning engagement may be attributed to several factors:

Intervention Duration: The relatively short duration of the intervention may not have been sufficient to elicit significant changes in learning engagement, which typically requires long-term reinforcement.

Intervention Adaptability: While the intervention focused on cultivating positive emotions, it may not have been sufficiently tailored to the vocational education context. Future interventions should integrate practical elements aligned with students' career training(Y. Zhang, 2024).

External Influences: Learning engagement is influenced by external factors, such as course difficulty, instructional style, and academic workload. These variables were not controlled for in this study and may have contributed to the

lack of significant findings.

Individual Differences: Participants' varying levels of interest and adherence to the intervention may have influenced the results.

4.2 Changes in Self-Efficacy

A paired-sample t-test was conducted to analyze the effect of the intervention on self-efficacy (Table 4). The results showed that the mean pre-test self-efficacy score was M = 2.64, SD = 0.467, whereas the post-test score increased to M = 2.88, SD = 0.473. The correlation between the pre-test and post-test scores was r = 0.64, indicating a moderate to strong relationship. The t-test results demonstrated a statistically significant difference between the pre-test and post-test scores, $t(75) = -5.19$, $p < .001$. This suggests that the positive psychology intervention had a significant effect on enhancing participants' self-efficacy.

Table 4. Significance Test of Self-Efficacy Scale and Correlation Analysis of Paired Samples

ariable	N	Mean (M)	Standard Deviation (SD)	Correlation (r)	df	p-value
Pre-Test	76	2.64	0.46	0.64	75	<.001
Post-Test	76	2.88	0.47			

To further explore the potential factors affecting changes in self-efficacy, independent t-tests and ANOVA were conducted for gender, class, and family economic status (see Table 5).

4.2.1 Gender

Pre-Test: The difference in self-efficacy scores between males (M = 2.711) and females (M = 2.635) was not statistically significant (p = 0.129). Post-Test: There was no significant gender difference in self-efficacy scores after the intervention (p = 0.482). Although gender may influence academic achievement (Else-Quest et al., 2010), it had little impact on the initial self-efficacy levels and intervention effects in this study.

4.2.2 Class

Pre-Test: No significant differences in self-efficacy scores were found among the different class groups (p = 0.591). Post-Test: The degree of improvement in self-efficacy did not significantly differ among the classes (p = 0.676).

This suggests that improvements in self-efficacy were not dependent on specific classroom environments but were influenced by broader intervention factors.

4.2.3 Family Conditions

Pre-Test: Students from better economic backgrounds had significantly higher self-efficacy scores than those from less advantaged backgrounds (p = 0.001). Post-Test: This trend remained significant in the post-test results (p = 0.035). Research has shown that socioeconomic status (SES) significantly impacts self-efficacy. Families with better economic conditions may provide more educational resources and psychological support, thereby fostering higher self-efficacy among their students.

Table 5. Self-efficacy Scale Data Demographic Variable Difference Test

	Category	Pre-Test Mean	p-value	Post-Test Mean	p-value
Gender	Male	2.711	0.129	2.867	0.482
	Female	2.635		2.865	
Class	Class 1	2.642	0.591	2.813	0.676
	Class 2	2.657		2.897	
	Class 3	2.626		2.909	
Family Conditions	Good	2.673	0.001	2.897	0.035
	Average	2.655		2.878	
	Needs Improvement	2.300		2.500	

The findings of this study indicate that positive psychology interventions can significantly enhance self-efficacy, aligning with Bandura's(Bandura, 1997) social cognitive theory, which posits that self-efficacy can be strengthened through external support and positive experiences. Additionally, the moderate to strong correlation between pre-test

and post-test scores suggests that initial self-efficacy levels may influence intervention outcomes.

Further analysis revealed that gender and class factors did not significantly impact changes in self-efficacy, whereas family economic status played a critical role. This finding is consistent with the existing research, which suggests that higher socioeconomic status is generally associated with higher self-efficacy levels (Chu, 2019).

The findings suggest that while the positive psychology intervention significantly enhanced self-efficacy, it did not have a measurable impact on learning engagement. Potential Explanations for the Non-Significant Change in Learning Engagement: The duration of the intervention may have been insufficient to generate long-term behavioral changes (Yao, 2018). The content of the intervention may not have been optimally aligned with vocational students' educational contexts (Zhang, 2024). External academic factors such as curriculum structure and teaching methods may have influenced engagement outcomes, and the mechanisms Underlying the Improvement in Self-Efficacy: The may have strengthened students' confidence and promoted positive emotions (Bamiro, 2023).

The external support provided by the intervention likely contributed to the enhanced self-perceptions. Students from higher socioeconomic backgrounds may have benefited more, underscoring the importance of social support (Sucuoğlu, 2018).

5. Discussion

5.1 Summary of Key Findings

This study examined the effects of a positive psychology intervention on students' learning engagement and self-efficacy. The findings suggest that, while the intervention significantly improved self-efficacy, it did not produce statistically significant changes in learning engagement. These findings contribute to the growing body of research on positive psychology in educational settings, highlighting its potential benefits and limitations.

Learning Engagement: No significant improvement was observed in overall engagement, vigor, dedication, or absorption. Possible explanations include the duration of the intervention, participant adherence, and external factors that influence engagement. Prior research suggests that engagement is influenced by both intrinsic motivation and external environmental factors such as teacher support and peer interactions (Skinner & Pitzer, 2012). The self-determination Theory(Deci & Ryan, 2008) suggests that engagement is strongly influenced by autonomy, competence, and relatedness. The current intervention may not have sufficiently addressed these elements, particularly in terms of fostering autonomy and social support. Future interventions may need to incorporate additional behavioral strategies, such as cooperative learning, and autonomy-supportive teaching, to effectively enhance student engagement (Reeve, 2012).

Self-efficacy: The intervention significantly enhanced self-efficacy, with post-test scores showing a notable increase. This finding supports Bandura's (1997) social cognitive theory, which posits that self-efficacy can be developed through external support, mastery experiences, and positive reinforcement. Additionally, Attribution Theory (Weiner, 1985) suggests that students who attribute success to effort, rather than fixed ability, are more likely to develop resilience and self-efficacy. The intervention's success in improving self-efficacy may be linked to its focus on mastery experience and positive reinforcement. Similar results have been found in studies demonstrating that structured interventions incorporating goal setting and self-reflection can enhance students' confidence in their abilities (Zimmerman, 2000)(Zimmerman, 2000). This significant improvement in self-efficacy underscores the importance of fostering positive psychological resources to support students' academic and personal development.

Demographic Factors: Gender and class did not significantly affect changes in learning engagement or self-efficacy, whereas family economic status was a key determinant of self-efficacy improvement. Previous research has indicated that socioeconomic disparities can affect students' psychological resources, influencing their motivation, academic resilience, and long-term educational attainment (Eccles & Wang, 2012). These findings reinforce the need for targeted interventions to support students from lower socioeconomic backgrounds.

5.2 Implications for Practice

Given the mixed results, several practical recommendations emerge for future educational interventions:

Enhancing Learning Engagement: Since the intervention did not significantly impact engagement, future programs should explore alternative strategies, such as extended intervention duration, increased interactive components, or personalized coaching (Fredricks et al., 2004). Studies have suggested that sustained interventions, particularly those that integrate experiential learning and real-world applications, may have a stronger effect on engagement (Ryan & Deci, 2020). Additionally, interventions that involve collaborative learning and peer mentoring may enhance

engagement more effectively than individual-focused approaches (Wentzel et al., 2010).

Targeted Support for Low-SES Students: The strong link between socioeconomic status and self-efficacy highlights the importance of providing additional support mechanisms to students from disadvantaged backgrounds. Schools should consider implementing mentorship programs, and psychological resilience workshops to help students build confidence and develop coping strategies (Chen et al., 2021). Research also suggests that increasing access to extracurricular activities and after-school tutoring programs can mitigate some of the challenges associated with lower socioeconomic status (Long, 2015).

Teacher Training in Student Motivation: The discrepancies between teacher and student assessments of engagement suggest that educators may benefit from professional development focused on fostering student motivation and well-being(Hagenauer et al., 2015). Training programs that enhance teachers' understanding of self-efficacy, motivation, and student engagement strategies, such as motivational interviewing and autonomy-supportive teaching, have been shown to improve student outcomes (Reeve, 2012). Moreover, equipping teachers with tools to recognize and address students' psychological barriers to learning could enhance the effectiveness of future interventions.

Application in Vocational Education: In context of vocational education, integrating positive psychology interventions with career counseling and skill-based training may enhance their effectiveness. Vocational students often face unique challenges such as career uncertainty and lower academic self-concept. Implementing interventions that align with vocational skills development, such as resilience training in workplace settings and industry mentorship programs, could improve engagement and self-efficacy. Given the ongoing reforms in Chinese vocational education, integrating these psychological strategies into skill-based curricula can provide long-term benefits.

5.3 Limitations and Future Research Directions

While this study provides valuable insights, several limitations should be considered:

Short Intervention Duration: The relatively brief timeframe of the program may have contributed to the lack of significant changes in engagement. Prior studies have indicated that longer interventions tend to yield more substantial and lasting improvements. Increasing student involvement in co-designing interventions may also enhance their engagement.

Measurement Constraints: This study did not assess changes in students' sense of meaning, which is a core component of PERMA and may influence engagement and well-being (Steger et al., 2009). Future research should incorporate assessments of meaning in learning to provide a more comprehensive understanding of students' psychological development.

Need for Multi-Informant Assessments: Since teacher-student agreement on engagement was relatively low, future studies should utilize multi-informant methods, integrating both self-reports and external evaluations (Dicke et al., 2012). Research has shown that incorporating parental and peer assessments can provide a more nuanced view of students' motivational and psychological development. Additionally, future studies should consider qualitative approaches, such as interviews and focus groups, to gain deeper insight into students' subjective experiences.

Exploring Mediating Mechanisms: Future research should explore potential mediators of the intervention's effects of the interventions, such as changes in students' emotional regulation, resilience, and goal-setting behaviors. Understanding these underlying mechanisms could inform the design of more effective positive psychology interventions in educational settings (Zimmerman, 2000). Examining how interventions interact with structural factors such as institutional support and internship opportunities in vocational education could also be beneficial.

5.4 Final Thoughts

Although the intervention was successful in enhancing self-efficacy, its limited impact on engagement suggests that additional factors must be considered when designing interventions to improve students' academic motivation and psychological well-being. Future studies should adopt a holistic approach, integrating psychological, social, and structural factors to optimize the effectiveness of positive psychology interventions in school settings. Addressing these challenges through refined intervention strategies and rigorous research will be essential in shaping educational programs that support students' overall development, particularly in vocational education, where career-related self-efficacy is crucial.

6. Conclusion

This study examined the effects of a positive psychology intervention on students' learning engagement and self-efficacy. The findings indicate that while the intervention significantly enhanced students' self-efficacy, it did not

produce statistically significant improvements in learning engagement. These results suggest that positive psychology interventions have the potential to strengthen students' psychological resources but may require further refinement to effectively enhance learning engagement.

Regarding learning engagement, the study found no significant improvement in students' vigor, dedication, or absorption. Possible explanations include the relatively short intervention duration, participant adherence, and external environmental factors. According to Self-Determination Theory (Deci & Ryan, 2008), engagement is strongly influenced by autonomy, competence, and relatedness. The present intervention may not have sufficiently addressed autonomy support and social support, which are crucial for engagement. Future interventions should incorporate strategies such as cooperative learning and autonomy-supportive teaching to enhance students' learning engagement more effectively.

In terms of self-efficacy, the intervention led to a significant increase in students' self-efficacy scores. This finding aligns with Bandura's (1997) Social Cognitive Theory, which suggests that self-efficacy can be developed through external support, mastery experiences, and positive reinforcement. Additionally, Attribution Theory (Weiner, 1985) posits that students who attribute success to effort rather than fixed ability are more likely to develop resilience and confidence. The intervention's success in improving self-efficacy may be attributed to its emphasis on mastery experiences and positive reinforcement, consistent with previous studies demonstrating the effectiveness of structured interventions incorporating goal setting and self-reflection.

Furthermore, this study found that gender and class had no significant effect on changes in learning engagement or self-efficacy, whereas family socioeconomic status (SES) played a crucial role in self-efficacy improvement. This finding reinforces existing research suggesting that socioeconomic disparities influence students' psychological resources, motivation, academic resilience, and long-term educational attainment. The results highlight the necessity of targeted interventions to support students from lower socioeconomic backgrounds.

Based on these findings, several practical recommendations emerge. First, to improve learning engagement, future interventions should explore alternative strategies, such as extending the intervention duration, increasing interactive components, or integrating personalized coaching. Second, additional support should be provided for students from disadvantaged socioeconomic backgrounds, such as mentorship programs and psychological resilience workshops to enhance their confidence and coping strategies. Finally, professional development programs for teachers should focus on fostering student motivation and well-being, equipping educators with effective strategies such as motivational interviewing and autonomy-supportive teaching to enhance student outcomes.

Despite providing valuable empirical evidence on the effectiveness of positive psychology interventions in vocational education, this study has several limitations. The relatively short intervention duration may have contributed to the lack of significant improvement in engagement. Additionally, the study did not assess changes in students' sense of meaning, a core component of the PERMA model, which may influence engagement and well-being. Moreover, discrepancies between teacher and student assessments of engagement suggest the need for multi-informant evaluation methods, integrating self-reports with external assessments. Future research should also explore mediating mechanisms, such as the role of emotional regulation, resilience, and goal-setting behaviors in shaping the effects of interventions.

Overall, this study contributes to the growing body of literature on the role of positive psychology in education, particularly in vocational education. While the intervention was effective in enhancing self-efficacy, its limited impact on engagement suggests that additional factors must be considered when designing interventions to improve students' academic motivation and psychological well-being. Future studies should adopt a holistic approach that integrates psychological, social, and structural factors to optimize the effectiveness of positive psychology interventions in educational settings. In the vocational education context, enhancing career-related self-efficacy will be crucial in supporting students' academic success and career development.

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