

Structural Relationships Between Classroom Culture, Motivation, Carrer interest, Self-Efficacy, and Career Planning in Chinese Secondary Vocational Education

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Abstract

This study aimed to construct and validate a structural model that explains the influence of Classroom Culture Construction, Learning Motivation, Carrer interest, and Self-Efficacy on Career Planning among secondary vocational students in mainland China. A total of 807 valid questionnaires were collected from a provincial demonstration vocational school using a combination of stratified cluster sampling and convenience sampling. Established measurement scales were adapted for the Chinese vocational education context, and the data were analyzed using structural equation modeling. Structural equation modeling results indicated that Classroom Culture Construction, Learning Motivation, and Carrer interest had significant positive effects on Self-Efficacy, which subsequently exerted a significant positive effect on Career Planning, demonstrating its mediating role in linking contextual and motivational factors with career outcomes. Classroom Culture Construction, Learning Motivation, Carrer interest, and Self-Efficacy all demonstrated significant positive effects on Career Planning, with Learning Motivation showing the strongest predictive strength among all variables. Differential analysis revealed that gender, grade level, and academic self-evaluation produced significant differences in some of the core variables. By integrating classroom environmental factors with individual psychological resources within a unified framework, this study extends existing career planning models that primarily emphasize personal traits and highlights the combined influence of educational context and internal motivation on students' career development. The study highlights the importance of cultivating supportive classroom culture, enhancing learning motivation, fostering carrer interest, and strengthening self-efficacy to improve students' career planning.

Keywords: Classroom culture construction, Learning motivation, Carrer interest, Self-efficacy, Career planning

Introduction

Against the background of China's high-quality development, secondary vocational education is gradually shifting from a traditional employment-oriented approach to a career development-oriented paradigm, emphasizing the integrated cultivation of vocational cognition, self-development capacity, and lifelong learning competence (Gao & Mohamad, 2025). This policy transition not only raises practical demands for talent training but also calls for theoretical models that can explain how educational environments and

psychological resources jointly shape students' long-term career development. However, existing career planning research has rarely addressed this integrated perspective within the context of secondary vocational education.

Compared with general high school or university students, secondary vocational students often enter education with weaker academic foundations, lower learning confidence, and more immediate employment pressure, which makes them particularly vulnerable to

unclear career goals, insufficient motivation, and low self-efficacy. In reality, many secondary vocational students commonly face challenges such as unclear career goals (Iswahyudi et al., 2023), insufficient learning motivation (Chuang et al., 2022), and low self-efficacy (Gogh et al., 2021), lacking the awareness and ability to actively plan for their future (Martini et al., 2023). These difficulties not only hinder their current academic engagement but also restrict the development of sustainable career planning competence, highlighting an urgent need for targeted theoretical explanations and intervention models for this population.

Research has indicated that a supportive classroom culture provides a favorable learning atmosphere and social environment and enhances students' value identification, confidence, and learning engagement, thereby promoting their readiness for career development (Khuhro, 2024). Learning motivation, particularly intrinsic and future-oriented motivation, serves as an essential psychological driving force that supports students' vocational exploration and career planning (Wang et al., 2023). Self-efficacy, as a key self-belief variable, determines whether students believe they are capable of pursuing future careers and influences their willingness to continuously engage in career development actions (Arghode et al., 2021). Career interest functions as a directional factor, helping students identify suitable occupational domains; however, without the support of self-efficacy and motivation, interest alone may not be sufficient to trigger actual career planning behaviors (Martini et al., 2023).

Despite these findings, prior studies typically examine these variables in isolation or focus primarily on individual psychological traits, overlooking the role of educational context variables such as classroom culture. Moreover, most empirical evidence has been derived from general education settings rather than vocational schools, leaving the mechanisms underlying career planning among secondary vocational students underexplored. In vocational education, classroom culture has been shown to influence students' psychological readiness for career development through multiple pathways, such as enhancing learning atmosphere, strengthening emotional support, and fostering value identification (Warsi et al., 2025);

however, this variable has not yet been systematically incorporated into career planning models.

Therefore, to address these theoretical and empirical gaps, this study adopts the perspectives of classroom culture construction, learning motivation, self-efficacy, and career interest to construct and validate a mechanism model for the formation of career planning competence among secondary vocational students. By integrating classroom environmental factors with psychological variables into a unified framework, the study seeks to extend existing career planning theories beyond trait-based explanations and provide a context-sensitive account of vocational students' career development. The aim is to reveal the key paths and influencing mechanisms in the development of career planning and to provide theoretical guidance and practical implications for cultivating development-oriented skilled talents in vocational education.

Objectives

1 The purpose of this study is to construct and validate a structural model exploring the relationships among classroom culture construction, learning motivation, career interest, self-efficacy, and career planning among secondary vocational students.

2 The purpose of this study is to investigate how gender, grade, and academic level respectively influence classroom culture construction, learning motivation, career interest, self-efficacy, and career planning, and to further explore their impact on the career development process of secondary vocational students.

Literature review

Classroom culture is recognized as a critical educational context that precedes and shapes students' learning behavior and motivational systems, rather than emerging as a consequence of individual psychological states. It encompasses shared values, interaction norms, emotional support, and collective learning expectations, which help cultivate students' sense of belonging, value identification, and perceived learning meaning (Rahayu et al., 2024). When students perceive supportive peer relationships, teacher encouragement, and collaborative goal orientation, they are more likely to internalize learning purposes, develop stronger intrinsic motivation, and engage actively in learning activities (Wu et al.,

2022). From a contextual and developmental perspective, classroom culture functions as an antecedent environmental condition that provides social cues and value signals through which learning motivation and self-efficacy are gradually formed. Therefore, classroom culture is not merely an external management setting but a psychological climate that nurtures learning motivation and future-oriented development.

Learning motivation represents a core psychological mechanism through which contextual influences are translated into sustained engagement, and it is closely linked to contextual support, perceived task value, self-beliefs, and future goal orientation (Martin, 2023). When students hold high levels of learning interest, achievement drive, and learning responsibility, they are more likely to engage persistently, seek challenges, and develop stronger beliefs in their competence (Fathi et al., 2024). Such successful learning experiences, supported by a positive classroom culture, further reinforce self-efficacy beliefs. Career interest, as a relatively stable preference toward specific occupational domains, is shaped through learning experiences, social interaction, and self-concept development (Gfrorer et al., 2022). When learning environments are meaningful, interactive, and supportive, career interest is more likely to evolve from exploratory preference to sustained and purpose-driven career inclination (Qingyan, 2025). Learning motivation activates exploratory behavior, while career interest provides directional guidance, and together they contribute to the development of career-related self-efficacy.

Self-efficacy serves as a key psychological mechanism linking contextual and motivational factors to career-related outcomes. It enables individuals to make accurate judgments about their abilities, helping them align personal strengths with future career goals (Brass et al., 2023). Through accumulated successful experiences, students strengthen their career confidence and develop more realistic and attainable career plans (Sitinjak & Canu, 2023). Self-efficacy plays a crucial role in career goal setting, as students with higher efficacy tend to set more challenging and long-term goals and show stronger persistence in pursuing them (Zhao et al., 2023). It is also positively influenced by contextual factors such as teacher support, peer

encouragement, and positive feedback (Gemmink et al., 2021). When career interest and learning motivation are aligned with efficacy beliefs, students are more likely to transform career aspirations into sustained planning and action preparation (Quinlan & Renninger, 2022).

Career planning is not only a cognitive process but also a developmental outcome shaped by the interaction between educational context and individual psychological resources, consistent with Social Cognitive Career Theory, which emphasizes the joint influence of contextual supports, self-efficacy, and motivational factors on career behavior (Khodjakulova, 2025). Classroom culture supports career planning by fostering belonging, value identification, emotional security, and developmental awareness, encouraging students to explore vocational pathways and set future goals (Chen et al., 2023). Learning motivation further enhances students' willingness to engage in career exploration, while career interest provides direction for career goal formation (Arifin & Yusuf, 2024). Within this theoretical framework, classroom culture influences career planning both directly and indirectly through motivational processes and self-efficacy beliefs, making career planning more actionable and intrinsically driven (Edwards et al., 2024).

Research methodology

Research sample

The population of this study consists of full-time students enrolled in secondary vocational schools in mainland China. According to data from the Ministry of Education of the People's Republic of China (2023), there are approximately 14.86 million students in secondary vocational schools nationwide, accounting for 34.5% of the total number of students in upper secondary education. More than 62% of these students come from county-level or rural areas, demonstrating the distinctive vocational orientation and regional concentration of this educational group. Secondary vocational students typically share several characteristics, their ages are mainly between 15 and 19, the educational type is clearly practice-oriented and skill-based, with an emphasis on vocational preparation, and their awareness of career planning gradually begins to form. These features indicate that secondary vocational students constitute an appropriate population for examining career interest, learning motivation, self-

efficacy, and career planning within vocational education contexts.

Following a combination of convenience sampling and stratified cluster sampling, this study selected a single provincial model secondary vocational school located in central mainland China as the sample site. The use of a single-school sampling strategy was intended to provide a stable and clearly bounded institutional context for theory testing, rather than to achieve national-level representativeness. The school offers a wide range of majors, including Information Technology, Finance and Business, Equipment Manufacturing, Education and Arts, and Tourism

Services, and its student composition demonstrates a diversified professional structure commonly observed in comprehensive secondary vocational institutions, which supports the examination of structural relationships among variables within a typical vocational education setting. Based on grade-level stratification, students were selected from Grade One, Grade Two, and Grade Three classes across various majors to participate in the survey. A total of 850 questionnaires were distributed in both paper and online formats, and 807 valid responses were collected, yielding an effective response rate of 94.9%.

Conceptual framework

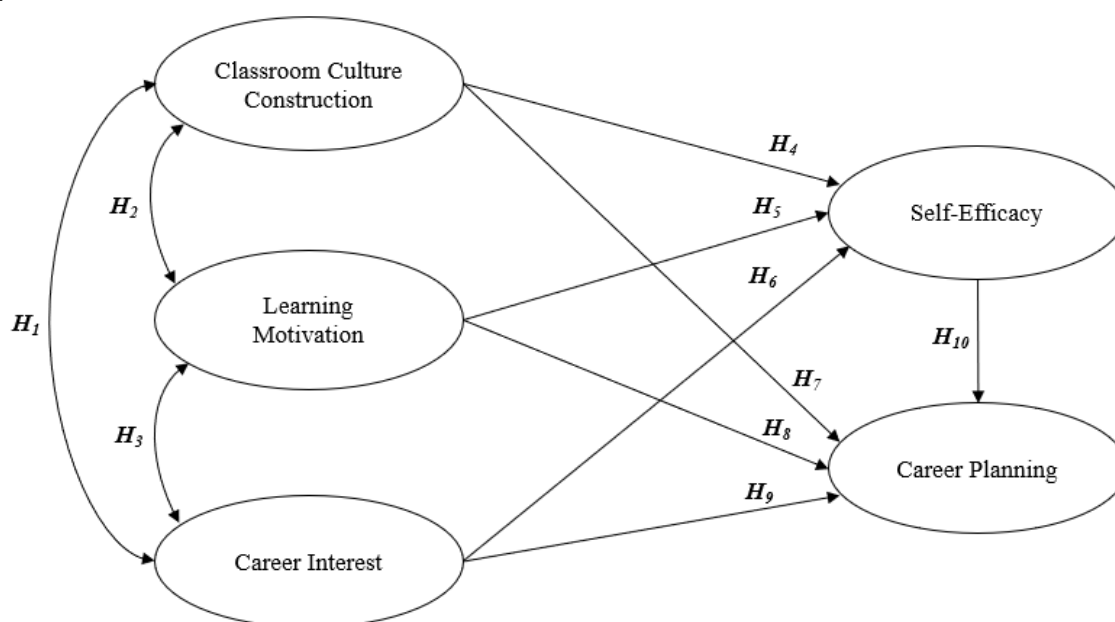


Figure 1 Research framework

Source: Self-designed by the researcher.

Table 1 Overview of the research participants

Category	Description
Total Participants	807 students
Gender	Male (47.3%), Female (52.7%)
Grade (Secondary Vocational)	1 st Year (34.8%), 2 nd Year (34.2%), 3 rd Year (31%)
Academic Level	Poor (20.2%), Fair (17.5%), Average (20.1%), Good (19.2%), Excellent (23.0%)

The descriptive analysis (Table 1) indicates that the sample is relatively balanced in terms of demographic characteristics. Gender distribution shows 425 females (52.7%) and 382 males (47.3%), suggesting

no significant gender bias. In terms of grade level, the participants were evenly distributed across three cohorts, with 281 first year (34.8%), 276 second year (34.2%), and 250 third year students (31.0%), indicating a well-

represented population across different stages of secondary vocational education. Regarding self-evaluated academic performance, students were mainly concentrated in the middle levels, with 23.0% rating themselves as excellent, 19.2% as good, 20.1% as average, 17.5% as fair, and 20.2% as poor.

Research instruments

This study adopted a questionnaire survey method to collect data. All variables were measured using established and validated scales, with appropriate cultural and linguistic adaptations made to align with the language characteristics and cognitive level of secondary vocational school students. To ensure linguistic and contextual appropriateness for secondary vocational students in mainland China, a translation and adaptation procedure was followed. The original English items were translated into Chinese and reviewed by two bilingual researchers with expertise in vocational education to ensure semantic equivalence and contextual clarity. The questionnaire consisted of six sections, measuring classroom culture construction, learning motivation, career interest, self-efficacy, and career planning. All items employed a five-point Likert scale ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree".

The demographic information section was used to collect basic participant details, including gender, grade level, and self-evaluated academic performance. Classroom culture construction was measured using the Perceived Classroom Culture Scale developed by Zhang et al. (2016). The scale consists of 20 items and includes four dimensions, rules and order, learning atmosphere, value identification, and emotional support, which assess students' perceptions of the overall cultural climate of the classroom. Learning motivation was assessed using the Learning Motivation Scale for Secondary Vocational Students revised by Long (2010), the scale contains 20 items across four dimensions, learning interest, achievement motivation, learning responsibility, and external incentive, and measures students' learning drive and psychological engagement in learning. Career interest was measured using the Career Interest Questionnaire for Secondary Students revised by Bao & Chen (2010), the questionnaire consists of 24 items and includes six dimensions, realistic, investigative, artistic, social, enterprising, and

conventional. It was used to assess students' occupational interest types and identify their potential career development orientations. Self-efficacy was measured using the General Self-Efficacy Scale Chinese version revised by Wang & He (2002), which contains 10 items and evaluates individuals' confidence and perceived control when facing learning tasks, challenging situations, or future planning. Career planning was assessed using the Career Planning Ability Scale, with the Chinese version revised by Yan et al., (2024). The scale includes 20 items across four dimensions: career cognition, career goal, action planning, and self-appraisal, and provides a comprehensive measurement of secondary vocational students' level of career planning ability.

Data analysis

In this study. Cronbach's α coefficients were employed to examine the internal consistency of each variable and its subdimensions, in order to determine the stability and reliability of the scales; The Kaiser-Meyer-Olkin value and Bartlett's test of sphericity were applied to assess whether the data were suitable for factor analysis, followed by the examination of factor loadings for individual items; Difference analysis was conducted to explore whether there were significant variations in the core variables, across different demographic characteristics of the sample; Pearson correlation analysis was performed to identify the relationships among the variables and to determine whether they met the prerequisite conditions for model construction; AMOS was then utilized to construct the structural equation model, in order to explore both the direct influence paths of classroom culture construction on career planning and the indirect influence paths mediated by learning motivation, career interest, and self-efficacy. To address potential common method bias resulting from the self-reported questionnaire design, Harman's single-factor test was conducted by entering all measurement items into an unrotated exploratory factor analysis. In addition, indirect effects and mediation were examined using bootstrapping procedures within the structural equation modeling framework. Bootstrapping was applied to obtain bias-corrected confidence intervals for indirect effects, providing a robust assessment of mediation effects beyond traditional significance testing.

Findings

In this study, reliability and validity tests were conducted on the five core variables, classroom culture construction, learning motivation, career interest, self-

efficacy, and career planning, to ensure the reliability and structural soundness of the measurement instruments.

Table 2 Results of exploratory factor analysis and reliability analysis

	VAR	No. of items	Loading Factors	Communality	% of Variance	Cronbach α
CCC	CCC1	5	0.707-0.808	0.563-0.879	62.029	0.911
	CCC2	5	0.664-0.823	0.508-0.874		
	CCC3	5	0.678-0.821	0.524-0.877		
	CCC4	5	0.609-0.803	0.456-0.873		
LM	LM1	5	0.665-0.811	0.519-0.867	61.099	0.910
	LM2	5	0.607-0.794	0.487-0.845		
	LM3	5	0.622-0.789	0.499-0.842		
	LM4	5	0.643-0.805	0.505-0.847		
CI	CI1	4	0.72-0.78	0.614-0.829	66.507	0.925
	CI2	4	0.669-0.748	0.564-0.848		
	CI3	4	0.66-0.788	0.583-0.842		
	CI4	4	0.639-0.751	0.576-0.818		
	CI5	4	0.659-0.757	0.499-0.839		
	CI6	4	0.68-0.757	0.561-0.841		
	SE	10	0.657-0.952	0.432-0.906	51.910	0.897
CP	CP1	5	0.669-0.806	0.521-0.854	60.837	0.904
	CP2	5	0.63-0.811	0.48-0.858		
	CP3	5	0.653-0.817	0.508-0.85		
	CP4	5	0.569-0.77	0.463-0.815		

Note: CCC= Classroom Culture Construction, LM= Learning Motivation, CI= Career Interest, SE= Self-Efficacy, CP= Career Planning.

The results of reliability analysis showed that all Cronbach's α coefficients exceeded 0.78, indicating strong internal consistency. Among them, the career interest scale demonstrated the highest reliability ($\alpha = 0.925$), while the classroom culture construction, learning motivation, self-efficacy, and career planning scales all exhibited α coefficients above 0.89. At the subscale level, the α coefficients ranged from 0.785 to 0.865, all exceeding the minimum acceptable threshold of 0.7. These results confirm that the measurement scales have high internal consistency, and the items demonstrate strong stability and coordination, effectively reflecting the authentic characteristics of each construct.

The KMO and Bartlett's tests of sphericity were performed for all variables. The KMO values for the classroom culture construction, learning motivation, career interest, self-efficacy, and career planning scales were 0.883, 0.892, 0.899, 0.900, and 0.879, respectively, all significantly exceeding the recommended threshold of 0.7, indicating satisfactory sampling adequacy. The significance levels of Bartlett's tests were all below 0.001, rejecting the null hypothesis that the correlation matrices were identity matrices, which suggests that the data were suitable for factor analysis.

The results of exploratory factor analysis further supported the structural validity of the scales. The classroom culture construction scale extracted four common factors with eigenvalues greater than one,

explaining a cumulative variance of 62.029%, with each factor contributing between 14% and 16% of the variance. The items were clearly grouped into four dimensions: rules and order, learning atmosphere, value identification, and emotional support, with all factor loadings above 0.6. The learning motivation scale similarly extracted four components with a cumulative variance explanation rate of 61.099%. The items exhibited clear loading patterns, and the variance contributions across dimensions were relatively balanced, confirming the scale’s multidimensional structure. The career interest scale extracted six

common factors, with a cumulative variance explanation rate of 66.507%, which is consistent with the RIASEC theoretical framework. The self-efficacy scale extracted only one common factor, explaining 51.91% of the total variance, which aligns with the theoretical assumption that self-efficacy is a unidimensional construct reflecting generalized perceived competence. The career planning scale extracted four common factors, explaining 60.837% of the variance, with clearly distributed factor loadings and no cross-loading, demonstrating a stable and reasonable multidimensional structure.

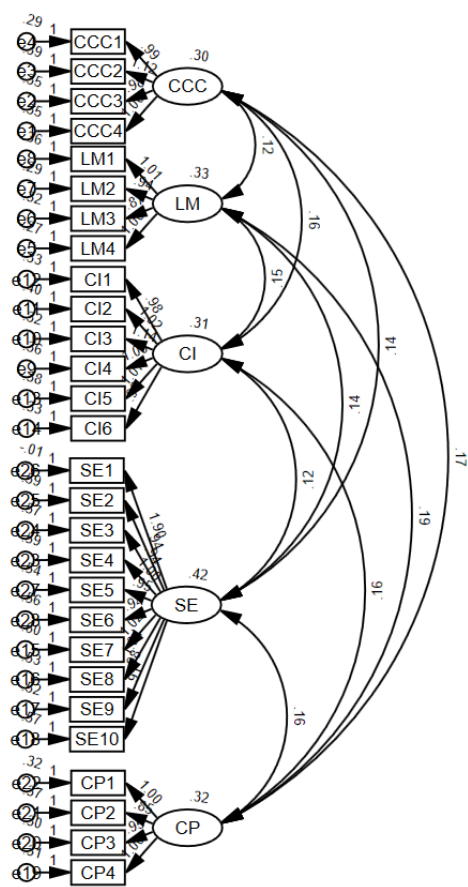


Figure 1 Confirmatory factor analysis results
Source: Developed by the author using AMOS.

Confirmatory factor analysis was conducted using AMOS to assess the measurement model. Reliability and validity were examined through standardized factor loadings, average variance extracted, composite reliability, and tests of convergent and discriminant validity. Using valid survey responses, the goodness-of-fit indices of the hypothesized Career Planning

influencing factors model met the recommended criteria, demonstrating an adequate model fit. The results are presented in Figure 1. According to table 3. all standardized loadings were significant ($p < .001$). Composite reliability values ranged from 0.777 to 0.900, exceeding the recommended threshold of 0.70. Average variance extracted values ranged from 0.567 to 0.594,

surpassing the 0.50 criterion, indicating satisfactory convergent validity.

This study examined whether significant differences exist in the core variables across different demographic groups. Gender, grade level, and self-evaluated academic performance were used as grouping variables. Independent samples t-tests and one-way ANOVA were conducted to analyze the differences in these psychological and behavioral variables among groups. The results of the difference analysis are presented in table 4.

Based on gender, the independent samples t-test results indicated that there was a statistically significant difference in Classroom Culture Construction between male and female students ($t = 2.573$, $p < 0.01$), with male students scoring slightly higher ($M = 3.22$, $SD = 0.60$) than female students ($M = 3.11$, $SD = 0.67$). However,

in Learning Motivation, Career Interest, Self-Efficacy, and Career Planning, no significant gender differences were found ($p > 0.05$). Regarding grade level, one-way ANOVA results revealed significant differences in Classroom Culture Construction ($F = 6.322$, $p < 0.01$) and Career Interest ($F = 5.738$, $p < 0.01$), as well as a highly significant difference in Career Planning ($F = 10.099$, $p < 0.001$), while Learning Motivation ($F = 2.899$, $p > 0.05$) and Self-Efficacy ($F = 2.581$, $p > 0.05$) did not show statistically significant variation across grades. Regarding academic performance, the results indicated significant differences in Career Interest ($F = 6.089$, $p < 0.001$) and Self-Efficacy ($F = 4.492$, $p < 0.01$), while Classroom Culture Construction, Learning Motivation, and Career Planning did not show significant differences across academic performance groups ($p > 0.05$).

Table 3 Analysis of the confirmatory factors of the hypothesis model of career planning

Factors	Indicators	Estimate	S.E.	C.R.	P	AVE	CR
CCC	CCC4	0.681				0.58	0.787
	CCC3	0.676	0.063	15.702	***		
	CCC2	0.703	0.069	16.16	***		
	CCC1	0.71	0.061	16.268	***		
LM	LM4	0.74				0.594	0.795
	LM3	0.661	0.053	16.489	***		
	LM2	0.703	0.054	17.375	***		
	LM1	0.696	0.059	17.229	***		
CI	CI4	0.68				0.586	0.849
	CI3	0.746	0.062	18.195	***		
	CI2	0.668	0.061	16.581	***		
	CI1	0.691	0.058	17.061	***		
	CI5	0.698	0.062	17.213	***		
	CI6	0.686	0.057	16.963	***		
SE	SE4	0.643				0.576	0.9
	SE3	0.625	0.057	16.509	***		
	SE2	0.62	0.057	16.383	***		
	SE1	1.003	0.081	23.538	***		
	SE5	0.642	0.056	16.889	***		
	SE6	0.631	0.056	16.63	***		
	SE7	0.647	0.06	17	***		
	SE8	0.679	0.059	17.716	***		
	SE9	0.661	0.057	17.308	***		
	SE10	0.615	0.056	16.283	***		

Factors	Indicators	Estimate	S.E.	C.R.	P	AVE	CR
CP	CP4	0.711				0.567	0.777
	CP3	0.698	0.056	16.766	***		
	CP2	0.615	0.056	15.063	***		
	CP1	0.702	0.059	16.841	***		

Note: *** $p < 0.001$; CCC= Classroom Culture Construction, LM= Learning Motivation, CI= Career Interest, SE= Self-Efficacy, CP= Career Planning.

Table 4 Results of difference analysis

VAR	CCC		LM		CI		SE		CP	
	M±SD	t/F	M±SD	t/F	M±SD	t/F	M±SD	t/F	M±SD	t/F
Male	3.22±0.60	2.573	3.28±0.65	1.396	3.24±0.66	1.459	3.17±0.74	0.628	3.32±0.59	1.109
Female	3.11±0.67	**	3.34±0.57		3.30±0.58		3.13±0.71		3.27±0.62	
1 st Year	3.25±0.61	6.322 **	3.38±0.57		3.37±0.53	5.738	3.12±0.73		3.35±0.56	10.099 ***
2 nd Year	3.07±0.67		3.26±0.64	2.899	3.22±0.61	**	3.11±0.71	2.581	3.17±0.69	
3 rd Year	3.19±0.61		3.28±0.61		3.21±0.72		3.24±0.73		3.38±0.52	
Excellent	3.14±0.66		3.32±0.60		3.29±0.57		2.97±0.85		3.27±0.64	
Good	3.19±0.62		3.36±0.57		3.28±0.60		3.19±0.67		3.33±0.58	
Average	3.21±0.62	0.520	3.34±0.58	1.141	3.37±0.54	6.089 ***	3.23±0.66	4.492 **	3.31±0.60	0.748
Fair	3.13±0.66		3.27±0.64		3.35±0.56		3.13±0.72		3.24±0.63	
Poor	3.18±0.63		3.23±0.67		3.07±0.79		3.26±0.65		3.34±0.57	

Note: ** $p < 0.01$, *** $p < 0.001$; CCC= Classroom Culture Construction, LM= Learning Motivation, CI= Career Interest, SE= Self-Efficacy, CP= Career Planning.

Table 5 Results of correlation analysis

VAR	CCC	LM	CI	SE	CP
CCC	1				
LM	0.307**	1			
CI	0.429**	0.400**	1		
SE	0.325**	0.296**	0.309**	1	
CP	0.424**	0.457**	0.422**	0.352**	1

Note: ** $p < 0.01$; CCC= Classroom Culture Construction, LM= Learning Motivation, CI= Career Interest, SE= Self-Efficacy, CP= Career Planning.

The Pearson correlation analysis (Table 5) among the primary variables, namely Classroom Culture Construction, Learning Motivation, Career Interest, Self-Efficacy, and Career Planning, revealed that all variables are positively and significantly correlated ($p < 0.01$). Among these relationships, the correlation between Career Planning and Learning Motivation, between Career Planning and Classroom Culture Construction, and between Career Planning and Self-Efficacy demonstrated moderate levels of association,

indicating that these variables share meaningful and moderately strong linear relationships that support their inclusion in the subsequent structural equation modeling.

The model and its fit were tested using AMOS version 27.0, and the structural model is illustrated in Figure 2.

The structural equation model was analyzed using the maximum likelihood estimation method, as presented in the table 6. The value of chi-square to degrees of freedom (χ^2/df) was 3.291, which meets the

recommended threshold of less than five. The RMSEA was zero point zero five seven, while the GFI, NFI, TLI, and CFI values all exceeded 0.8. Furthermore, PNFI and

PGFI values were above 0.7, indicating that the model exhibited an acceptable to good level of fit.

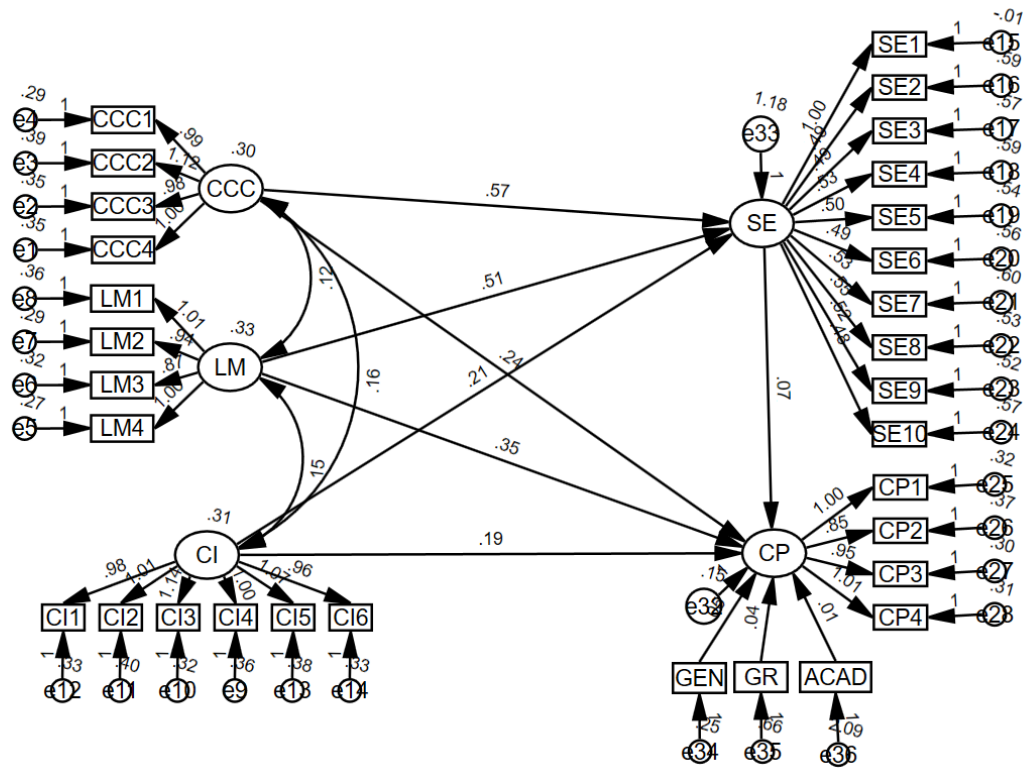


Figure 2 Structural equation modeling results
Source: Developed by the author using AMOS.

Table 6 Model fit indices for the structural model

Model Fit Indices	χ^2/df	RMSEA	GFI	NFI	TLI	CFI	PNFI	PGFI
Model Fit Values	3.291	0.053	0.902	0.866	0.893	0.902	0.789	0.771

The structural equation modeling results indicated that Classroom Culture Construction, Learning Motivation, and Career Interest all had significant positive effects on Self-Efficacy (Table 7). Specifically, Classroom Culture Construction had the strongest effect on Self-Efficacy ($\beta = 0.253$, C.R. = 5.485, $p < 0.001$), followed by Learning Motivation ($\beta = 0.238$, C.R. = 5.372, $p < 0.001$). Career Interest also had a positive but comparatively weaker influence ($\beta = 0.094$, C.R. = 2.008, $p < 0.05$). Regarding the influencing factors of Career Planning, all four predictor variables showed significant positive effects. Learning Motivation demonstrated the strongest predictive power on Career

Planning ($\beta = 0.346$, C.R. = 7.075, $p < 0.001$). Classroom Culture Construction also showed a significant positive effect ($\beta = 0.248$, C.R. = 5.051, $p < 0.001$). Career Interest exerted a moderate positive effect ($\beta = 0.176$, C.R. = 3.640, $p < 0.001$). Self-Efficacy also significantly influenced Career Planning ($\beta = 0.158$, C.R. = 4.205, $p < 0.001$). All path coefficients met the statistical significance threshold, with Critical Ratio values greater than 1.96 and p-values below the 0.05 level, confirming that the hypothesized relationships were supported by the data. These findings validate the conceptual model and demonstrate the interrelated contributions of classroom culture, learning motivation,

career interest, and self-efficacy to students' career planning development. Bootstrapping analysis was conducted to examine the indirect effects of Classroom Culture Construction, Learning Motivation, and Career Interest on Career Planning through Self-Efficacy. The

results showed that all indirect effects were statistically significant. These findings provide further support for the partial mediating role of Self-Efficacy in the proposed model.

Table 7 Standardized path coefficients for the structural model

Path	B	β	S.E.	C.R.	P
SE $\leftarrow$ CCC	0.572	0.253	0.104	5.485	***
SE $\leftarrow$ LM	0.508	0.238	0.094	5.372	***
SE $\leftarrow$ CI	0.203	0.094	0.101	2.008	*
CP $\leftarrow$ CCC	0.256	0.248	0.051	5.051	***
CP $\leftarrow$ LM	0.337	0.346	0.048	7.075	***
CP $\leftarrow$ CI	0.173	0.176	0.048	3.64	***
CP $\leftarrow$ SE	0.072	0.158	0.017	4.205	***

Note: * $p < 0.05$, *** $p < 0.001$; CCC= Classroom Culture Construction, LM= Learning Motivation, CI= Career Interest, SE= Self-Efficacy, CP= Career Planning.

Discussion

The findings of this study revealed that classroom culture construction, learning motivation, career interest, and self-efficacy all have significant positive effects on career planning among secondary vocational students. Taken together, these findings advance prior vocational education research by demonstrating that career planning is best explained through an integrated framework that combines educational context and psychological mechanisms, rather than through isolated individual factors. This indicates that career planning is not a purely cognitive process but rather the result of an interplay between educational context, motivational systems, personal belief structures, and future-oriented goal setting (Arifin & Yusuf, 2024).

Among these variables, learning motivation demonstrated the strongest predictive effect on career planning, refining existing assumptions in vocational education research that often emphasize interest or ability as primary drivers of career development. The present findings suggest that career planning essentially emerges as a motivation-driven psychological and behavioral process. When students are able to establish meaningful connections between their current learning and future career development, they are more likely to

form clear professional goals, demonstrate stronger planning intentions, and exhibit greater readiness for future career actions (Arifin & Yusuf, 2024). This extends prior studies by highlighting learning motivation as a central explanatory mechanism rather than a secondary outcome of interest or achievement. Consequently, vocational education should move beyond teaching knowledge for employment toward motivating future-oriented learning, emphasizing the internalization of personal goals, perceived career relevance, and long-term developmental thinking.

Moreover, while career interest was found to be significant, its effect was noticeably weaker than that of learning motivation and self-efficacy, challenging the implicit assumption in some vocational guidance literature that interest alone is sufficient to drive career planning. The findings indicate that interest primarily provides career direction but does not generate sustained planning behavior without support from capability beliefs and motivational reinforcement. This aligns with Gfrorer et al. (2022), who argue that career interest must be strengthened through competence beliefs and motivational mechanisms before it can transform into stable career-planning behaviors. Thus, this study refines the role of career interest by positioning it as a

directional rather than driving force in the career planning process.

The significant role of classroom culture construction in both direct and indirect effects on career planning confirms that career development is inherently context-dependent. Classroom culture is not merely an organizational or behavioral structure, but a psychosocial learning climate that shapes value recognition, peer support, emotional security, and perceptions of meaningful learning (Wu et al., 2022). When classroom norms promote collaboration, shared expectations, and supportive teacher–student relationships, students experience heightened belongingness and academic relevance, which in turn activate career exploration intentions and enhance planning confidence (Wang, 2020). This finding extends existing vocational education research by demonstrating that classroom culture functions as an antecedent contextual resource rather than a background condition, influencing career planning through motivational and efficacy-related pathways.

Rahayu et al. (2024) highlighted that a supportive educational culture plays an essential role in shaping students' values, identity formation, and long-term goal orientation. Building on this work, the present study provides empirical evidence that classroom culture operates as a contextual catalyst that strengthens learning motivation, nurtures self-efficacy, and facilitates the internalization of career-related meaning, thereby embedding career planning within everyday classroom experiences rather than treating it as a separate guidance activity.

Self-efficacy emerged not only as a significant predictor of career planning but also as a key mediating mechanism linking classroom culture, learning motivation, and career interest to career planning. This mediating role advances existing models of vocational development by clarifying how contextual and motivational factors are translated into concrete planning behaviors. Consistent with Martini et al. (2023), self-efficacy influences career decision-making persistence, goal commitment, and planning behaviors. Moreover, this study confirms the socially constructed nature of self-efficacy, showing that it can be strengthened through emotional support, experiential success, and future-oriented learning opportunities (Gogh et al., 2021).

As Brass et al. (2023) emphasized, self-efficacy plays a central role in lifelong career development by driving reflective thinking, future time orientation, and self-regulated planning. By identifying self-efficacy as a partial mediator, this study extends prior vocational education research that treated self-efficacy primarily as a direct predictor, demonstrating its bridging function between motivation, interest, and career planning behaviors. Career planning, therefore, reflects not only what students aspire to do, but also what they believe they are capable of achieving.

The analysis across demographic characteristics further deepens the theoretical interpretation of the findings. Grade level showed significant effects on classroom culture, career interest, and career planning, while learning motivation and self-efficacy remained relatively stable across grades. This pattern challenges a developmental assumption that motivational and efficacy beliefs naturally strengthen over time, suggesting instead that these psychological resources require intentional educational cultivation (Iswahyudi et al., 2023). Furthermore, although academic performance significantly influenced career interest and self-efficacy, it did not directly affect career planning. This finding challenges the traditional achievement-centered view of career readiness in vocational education, indicating that high academic performance alone does not guarantee effective career planning. Career planning should therefore be conceptualized as a developmental competency shaped by contextual support and psychological resources rather than as a byproduct of academic success.

Conclusion

This study constructed and validated a structural model to explore the effects of classroom culture construction, learning motivation, career interest, and self-efficacy on career planning among secondary vocational students. Based on 807 valid responses, the demographic distribution of the sample was relatively balanced, and the reliability analysis demonstrated strong internal consistency across all constructs.

The structural equation modeling results indicated that the proposed model achieved a satisfactory overall fit to the data. Classroom Culture Construction, Learning Motivation, and Career Interest were found to exert significant positive effects on Self-Efficacy, with

Classroom Culture Construction showing the strongest standardized effect among the three predictors, followed by Learning Motivation and Career Interest. In predicting Career Planning, all four variables demonstrated significant positive effects, among which Learning Motivation emerged as the most influential predictor, followed by Classroom Culture Construction, Career Interest, and Self-Efficacy. These findings consistently reflect the relative strength and direction of the standardized path coefficients reported in the Results section, confirming the internal coherence of the empirical evidence.

Based strictly on the empirical results, the findings suggest that career planning among secondary vocational students is shaped by the combined influence of classroom environment factors and individual psychological resources. Classroom Culture Construction functions as a foundational contextual condition, while Learning Motivation and Career Interest contribute motivational and directional support, and Self-Efficacy serves as a key psychological resource linking these factors to career planning outcomes. These conclusions are derived directly from the tested structural relationships rather than interpretive assumptions, ensuring a clear distinction between empirical evidence and theoretical inference.

In addition, the demographic analysis revealed differentiated effects across student groups. Gender differences were limited to Classroom Culture Construction, with male students reporting higher levels, while no significant gender-based differences were observed in Learning Motivation, Career Interest, Self-Efficacy, or Career Planning. Grade-level differences were evident in Classroom Culture Construction, Career Interest, and Career Planning, whereas Learning Motivation and Self-Efficacy remained relatively stable across grades. Furthermore, self-evaluated academic performance was associated with significant differences in Career Interest and Self-Efficacy, while no significant differences were found in Classroom Culture Construction, Learning Motivation, or Career Planning. These results underscore that academic achievement alone does not necessarily correspond to stronger career planning capacity.

Recommendation

Based on the research results, which demonstrate that classroom culture construction, learning motivation, career interest, and self-efficacy have significant positive effects on career planning among secondary vocational students, this study suggests the need for an integrated career development approach that aligns educational context with psychological resources, rather than prescribing a single instructional model. Given that learning motivation and self-efficacy showed stronger empirical effects on career planning than career interest, while classroom culture functioned as a foundational contextual factor, interventions should prioritize motivational and efficacy-enhancing mechanisms within supportive classroom environments.

At the policy level, the findings support the incorporation of career planning competencies as explicit developmental outcomes within secondary vocational education guidelines, particularly emphasizing motivational engagement and self-efficacy cultivation. Rather than introducing additional standalone courses, education authorities may consider embedding career planning indicators into existing curriculum standards, such as requiring schools to document students' career goal clarity, planning awareness, or participation in career-related learning activities at different grade stages.

At the institutional level, vocational schools may systematically integrate career planning objectives into classroom culture development initiatives, focusing on measurable elements such as classroom interaction quality, perceived emotional support, and future-oriented learning climate. For example, schools could establish mentoring or advisory systems in which students participate in structured career reflection sessions at least once per semester, or incorporate career-themed collaborative projects into core vocational courses, thereby operationalizing classroom culture as a developmental resource rather than an abstract construct.

At the classroom level, instructional practices may be adjusted to strengthen learning motivation by explicitly linking learning tasks with future vocational applications, consistent with the empirical finding that learning motivation exerted the strongest influence on career planning. Teaching strategies such as project-based learning, task-driven instruction, or vocational

simulation activities can be employed, provided that learning outcomes include clearly defined career-related reflections or planning outputs, such as short-term career goals, skill portfolios, or learning-to-career mapping exercises. These practices translate motivational engagement into observable planning behaviors, aligning instructional design with the study's empirical results.

Although career interest showed a comparatively weaker predictive effect, its directional role remains empirically supported. Accordingly, schools may implement structured career interest exploration mechanisms, such as standardized interest assessments, short-term industry exposure activities, or guided vocational workshops, with clear evaluation criteria, including students' ability to articulate interest–ability alignment or justify preferred career pathways. Such approaches allow career interest to function as a clarifying rather than determinative factor, consistent with its role in the model.

Self-efficacy was empirically identified as a key psychological mechanism linking contextual and motivational factors to career planning. To strengthen this mechanism, educators may introduce incremental and feedback-oriented interventions, such as stage-based career planning tasks, reflective learning logs, or portfolio assessments that document students' planning progress over time. Rather than emphasizing final career outcomes, instructional feedback may focus on students' demonstrated planning competence, self-reflection quality, and perceived control over future decisions, thereby translating self-efficacy into actionable planning capacity.

Finally, the demographic findings suggest that career planning interventions should be differentiated across developmental stages rather than uniformly applied. For first-year students, interventions may focus on measurable indicators of career awareness and motivation, such as participation in career orientation activities or basic goal articulation. For second-year students, greater emphasis may be placed on career exploration depth and self-efficacy development, assessed through skills identification tasks or exploratory project engagement. For third-year students, interventions may prioritize decision-making readiness and transition planning, evaluated through concrete outputs such as career action plans or transition

portfolios. In addition, students with lower academic self-evaluations may benefit from targeted efficacy-support interventions, including scaffolded planning tasks and individualized feedback, to prevent disengagement from the career planning process.

Limitation

In this study, the data were collected from a single provincial demonstration secondary vocational school using a combination of stratified cluster sampling and convenience sampling. Although this school exhibits typical characteristics of secondary vocational institutions in terms of student composition and program structure, the use of a single-site sample limits the external validity of the findings. Therefore, the results may not be directly generalizable to vocational schools operating under different institutional conditions, resource levels, or regional labor market contexts.

In addition, as a provincial demonstration school, the sampled institution may provide relatively richer program offerings, stronger industry connections, and more structured career guidance compared with non-demonstration schools. Such institutional characteristics may have contributed to students' perceptions of classroom culture, learning motivation, and career planning, potentially resulting in higher observed levels of these variables. Similarly, the local labor market environment surrounding the school, including employment opportunities and industry demand, may have shaped students' career interests and planning orientations. These contextual factors should be considered when interpreting the results.

Declaration of generative AI in scientific writing

The authors declare that no generative AI was used in the preparation of this manuscript. The authors take full responsibility for the content of the article.

CRedit author statement

Huan Huang: Data curation, Investigation, Formal analysis, Writing; **Lin Li:** Investigation, Validation, Writing; **Zheyun Zheng:** Conceptualization, Methodology, Supervision.

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