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Original Paper

Under the Perspective of the Integration of Industry and Education, Improving College Students' Career Maturity: The Mediating Effect of Career Decision-Making Self-Efficacy

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Abstract

This study explores the impact of career activity participation satisfaction and teacher support on college students' career maturity, verifies the mediating role of career decision-making self-efficacy therein, and finally proposes strategies for improving college students' career maturity from the perspective of the integration of industry and education. To this end, a total of 300 college students' questionnaire survey results were analyzed. The results show that both career activity participation satisfaction and teacher support have significant positive effects on career decision-making self-efficacy and career maturity. Among them, the direct influence of teacher support on career maturity is better than that of career activity participation satisfaction. In addition, career decision-making self-efficacy mediates the relationships between career activity participation satisfaction and career maturity, and between teacher support and career maturity, having a partial mediating effect. This indicates that in the process of improving college students' career maturity, it is necessary to focus on increasing college students' career practice opportunities, establishing a sound integration mechanism of industry and education, and paying attention to teachers' career guidance and support to enhance students' career decision-making self-efficacy, thereby ultimately promoting students' mature career awareness.

Keywords

Integration of industry and education, Satisfaction of career activity participation, Teacher support, Career decision-making self-efficacy, Career maturity

1. Introduction

Career maturity refers to an individual's degree of preparedness for career-development tasks corresponding to their age. If an individual has high abilities in career planning, implementation, decision-making, etc., they can make career choices suitable for themselves and thus achieve good career development. In recent years, phenomena such as graduates deferring employment and being unemployed immediately after graduation have been occurring. The employment survey of China by MyCOS (2023) shows that among the 2018-graduated undergraduates from undergraduate institutions, 73.6% were employed, and among vocational college graduates, 82.0% were employed; 2.7% of undergraduate graduates were waiting for employment, and 7.5% of vocational college graduates were waiting for employment. However, among the 2022-graduated undergraduates, the proportion of employed undergraduates decreased to 62.2%, and that of employed vocational college graduates decreased to 60.0%; the proportion of undergraduate graduates waiting for employment increased to 6.9%, and that of vocational college graduates waiting for employment increased to 12.3%. More seriously, some graduates will leave their jobs in a short time even if they are successfully employed because they have difficulty adapting to the work. From 2018 to 2022, the turnover rate of graduates within half a year has long remained at 42%. Among the 2022-graduated students, 43% left because they were dissatisfied with salary and benefits, 31% because they were dissatisfied with personal development space, and 19% because they were not adapted to the management system and culture. The survey of 2,650 college students by Jiang, Feng (2021) shows that 41.62% of newly-graduated college students are dissatisfied with salary income; 46.24% of college students are dissatisfied with career development prospects.

Correspondingly, most college students get employed when their career plans are not yet mature. Among them, 25% of the 2021-graduated students were forced by reality to take a job first and then choose a career in their career development; among the 2022-graduated students, the number of students forced by reality to take a job first and then choose a career continued to rise to 28% (MyCOS, 2023). Wang's (2018) survey of career planning during school among 586 college students in Shanxi Province, China, showed that only 9.56% of college students had clear career plans for themselves, 41.13% of college students chose to "take one step at a time", and 13.38% of students had not thought about career planning. In Qin's (2022) survey of college students in Hohhot, Inner Mongolia, only 9% of students clearly knew the career they wanted to pursue in the future during school, and 41% of college students did not have a specific career they clearly wanted to work in the future.

Modern educational theories emphasize that the combination of knowledge and practice is the key to promoting learning outcomes, and the importance of practical experience in the learning process has been mentioned by most researchers (Dewey, 1938; Kolb, 1984; Schunk, 2012). For college students, the current highly competitive job market has put forward higher requirements for the accumulation of pre-employment experience of college students. Therefore, students need to constantly look for

internship and part-time opportunities related to their majors, understand industry trends, accumulate work experience, and at the same time master the latest technologies and working methods in the current industry (Lei & Zhang, 2023). Chen, Qi, and Li (2022) proposed that college students need to adapt and evaluate their own abilities and work platforms in advance, reduce the trial - and - error costs of knowledge and vocational skills, and make effective career preparations for their clear career plans. It can be seen that the career development of college students requires the joint efforts of industry and education to form an ecological system of career support, helping students to provide necessary career guidance in the case of establishing practical experience, so that students can form a good sense of career maturity (Monteiro, Almeida & Garc á, 2020; Peeters, Nelissen, Cuyper, Forrier, Verbruggen & Witte, 2019). Fang, Leixin, and Zhenyi (2024) believe that college students with ideal career development can better understand how to show high efficiency and creativity in work, thus promoting the innovation and development of the industry. Ying and Hua (2024) indicated that college students with a good career consciousness are more likely to flexibly apply their abilities in the workplace, bring more benefits to relevant industrial sectors, and solve practical problems.

Career maturity is the basic guarantee for college students' employment, industrial talent demand, and educational talent cultivation. In order for college students to get employed smoothly and achieve high-quality employment development, it is necessary to promote the career maturity of college students from the perspective of the integration of industry and education. Some researchers have proposed that improving students' career maturity requires the joint efforts of the external and the internal, that is, providing them with more practical guidance and opportunities and attaching importance to their experience in participating in career activities (Kanjana & Surachai, 2023). On this basis, career activity participation satisfaction and teacher support can be used as paths to improve students' career maturity. As an internal factor, career activity participation satisfaction mainly focuses on an individual's recognition of the work itself, environment, salary, colleague relationships, career development opportunities, etc. in career activities (Jiang, 2023). For college students, career activity participation satisfaction refers to their recognition of activities related to their careers, such as internships, part-time jobs, campus job fairs, career planning lectures, and vocational skills training (Kim, 2019). Studies by Kim (2019) and Jiang (2023) both indicate that career activity participation satisfaction can have an impact on career maturity. Because career activities with high satisfaction can enhance college students' self-awareness, improve vocational skills, cultivate career decision-making ability, and increase career confidence (Kyungok & Junghee, 2021; Baiyan, Yuege, Yuzhe & Jun, 2024). Through active participation and obtaining satisfactory career activity experiences, students can clearly understand their own interests and abilities and enhance their sense of identity with the chosen career (Baek, Park & Kwon, 2017). This active participation attitude and experience can not only improve their vocational skills but also help them better cope with challenges in future careers and make wise career decisions (Baiyan, Xiaojing, Qun & Yuege, 2024).

As for teacher support, an external factor, its main role is to help students clarify career goals through guidance and encouragement. Because when students receive support and feedback from teachers during the career planning and development process, they will feel more confident and have a sense of direction (Baiyan, Xu, Siyu & Yuege, 2024). When this kind of support not only helps students acquire necessary vocational skills and knowledge but also cultivates their career consciousness, and the contribution of teacher support to career maturity has also been confirmed by relevant studies (Dongsim & Joo, 2017; Joo, Kang & Choi, 2013). In addition, during an individual's career development process, after receiving joint assistance from both internal and external sources, a positive psychological resource will be generated, namely career decision-making self-efficacy (Lee & Park, 2019; Youn & Hyun, 2019). Career decision-making self-efficacy often also plays an important mediating role, involving an individual's confidence in effectively choosing, setting goals, solving problems, and achieving career goals during the career decision-making process (Xinqiao, Xinyuan, Yiming & Wenjuan, 2023; Baiyan, Xiaojing, Qun & Yuege, 2024). For example, the research by Lee and Park (2019) shows that career decision-making self-efficacy is enhanced through parents' career behaviors, thereby promoting students' career maturity. Youn and Hyun's (2019) research shows that students learn from entrepreneurs' abilities to help themselves make favorable career decisions, thus promoting entrepreneurial intentions. It can be said that career decision-making self-efficacy not only reflects how an individual utilizes and transforms externally provided resources but also reveals how these external factors promote an individual's career development path and outcomes by influencing the individual's internal psychological state. The understanding of this mediating role has certain significance for designing and implementing effective integration of industry and education strategies and promoting students' career development.

Therefore, in the current context of difficult employment, various situations such as taking a job first and then choosing a career, unclear career planning, and early turnover after employment have significantly restricted the career development of college students. It is necessary to attach importance to cultivating career consciousness among college students during their school years. Currently, however, there is still a lack of empirical research in this field. The improvement mechanisms of career activity participation satisfaction, teacher support, and career decision-making self-efficacy on career adaptation remain to be proposed. This study examines the positive effects of college students' career activity participation satisfaction and teacher support on career maturity, and analyzes whether career activity participation satisfaction and teacher support will enable students to form career decision-making self-efficacy and thus improve career maturity under this path. This in-depth analysis helps relevant research to more comprehensively understand the relationships and functions among various factors and provides inspiration for college students' employment guidance. To this end, this study has proposed the following four research questions:

Research Question 1: What are the situations of college students' career activity participation satisfaction, teacher support, career decision-making self-efficacy, and career maturity?

Research Question 2: What are the impacts of college students' career activity participation satisfaction, teacher support, and career decision-making self-efficacy on career maturity?

Research Question 3: Do career activity participation satisfaction and teacher support indirectly affect career maturity through career decision-making self-efficacy?

Research Question 4: Based on the research analysis, how to effectively promote college students' career maturity in the context of the integration of industry and education?

2. Research Foundation

2.1 Integration of Industry and Education

The integration of industry and education refers to the in-depth cooperation between industry and education. It is the in-depth cooperation carried out by colleges and universities with industrial enterprises in order to improve the quality of talent cultivation (Zhu, 2024). In the mode of the integration of industry and education, students' practical activities in industrial departments are the core manifestation form of cooperation between colleges and universities and industries. These practical projects can be divided into college students' internship and training projects, innovation and entrepreneurship education, industry-university-research projects, etc. The purpose is to help students accumulate vocational practical experience in the actual working environment (Lu, 2022). Students can deepen their understanding and certainty of their own career planning based on the experience of vocational practical activities provided by the school. Therefore, students' satisfaction with participation in vocational activities can reflect students' vocational practice situation. At the same time, schools can also flexibly adjust the ways, plans, and objects of cooperation with off-campus industries according to students' satisfaction with participation in vocational activities, and understand the matching situation between the educational content within the school and the external industrial requirements, as an indicator for realizing the actual docking of educational content and the industry.

The high-quality career development of college students is inseparable from the support of teachers. Teachers are the guides of students' practical experience and also the participants in students' vocational education. It can be said that teachers' support has a direct driving force for industrial demand and talent cultivation. According to the views of Dongsim and Joo (2017), teachers' support for students in the vocational field is mainly reflected in information, emotional, and strategic support. Information support refers to the information related to learning content, career development, and industry trends provided by teachers. Emotional support refers to the care and help provided for students when they are dealing with crises. Strategic support is the clear planning of task goals and plans for students by teachers. Based on these research viewpoints, in this study, the "industry" in the integration of industry and education refers to college students' satisfaction with participation in career

activities. The “education” refers to teacher support. Under the combined action of college students’ satisfaction with participation in career activities and teacher support, the benign development of students' personal career consciousness is formed.

2.2 Satisfaction of Career Activity Participation

Satisfaction of career activity participation not only covers an individual’s feelings about specific work tasks but also includes a comprehensive evaluation of multiple aspects such as the overall work environment, colleague relationships, and career development opportunities (Hyun, 2018). It can reflect the internal and external satisfaction obtained during one’s career and directly affects subsequent work performance, career commitment, and well-being. For students, although their status is different from that of formal employees, they will also experience satisfaction of career activity participation in internships, part-time jobs, volunteer services, and other career-related activities. This concept has varying degrees of impact on students’ career development and learning outcomes (Jinhee, 2019). Dongsim and Joo (2017) believe that when the tasks undertaken by students in career activities such as internships or part-time jobs are challenging and diverse, they can stimulate students’ interests and enable them to improve their knowledge and skills in practice. Although the career activities in which students participate may be short-term, this learning process can still effectively enhance students’ professional abilities and also boost their self-confidence and sense of achievement.

Most studies have revealed that career activity participation satisfaction has a positive effect on career decision-making self-efficacy. For example, Royle, Fox, and Gonzalez (2016) believe that when college students obtain satisfactory and positive experiences in career activities, such experiences will promote them to establish a sense of identity and belonging in the industry they are engaged in, and increase students’ confidence in career decision-making. Sun’s (2012) research found that when participating in career activities with high participation satisfaction, individuals will trigger the motivation to independently cope with and solve challenges in the work, improving the ability to solve career decision-making problems. At the same time, it also promotes students’ ability to adapt to new environments and career roles. Xinqiao, Xinyuan, Yiming, and Wenjuan (2019) believe that positive feedback and recognition obtained by students in career activities can significantly enhance students’ self-evaluation and make them believe that they have the ability to make correct decisions. Career activity participation satisfaction also has a positive impact on career maturity. As Jeong’s (2023) research points out, career activity participation satisfaction can directly strengthen college students’ cognition and attitude towards careers, and also has a positive impact on career consciousness and attitude, enabling students to have clear goals and plans for their future self-planning and clarify their own positioning. Zhang (2022) verified that when interns have high internship satisfaction, their career attitude maturity is significantly improved.

2.3 Teacher Support

Teacher support is a constituent element within the social support system. Originally, the three elements of social support were family support, friend support, and teacher support (Baiyan, Yuege, Yuzhe & Jun, 2024). Originally, teacher support aimed to provide students with help and encouragement in various ways to promote their academic, emotional, and social development, meet their multiple needs, and assist them in achieving personal goals (Oh, 2015). In the field of student vocational education, teacher support means providing systematic help through resources such as information and emotion to promote the development of students' vocational cognition, the improvement of skills, and the achievement of vocational goals (Baiyan, Yuege, Yuzhe & Jun, 2024). Moreover, the scope of students' social activities on campus is relatively limited, and their cognition is still in the development stage. School is the second social environment for students. Therefore, teachers have an important influence on students' career development in this environment (Lee, 2016). In Oh's (2015) research, it is suggested that teachers actively help students understand the characteristics and requirements of different careers by sharing career information and employment market trends, which can enable students to save the cost of career exploration and make wise career choices. Joo, Kang, and Choi (2013) indicated that teachers have always been the basic external resource for students' career development. During the career planning process, teachers help students prepare for career activities by guiding them and providing practical operation suggestions in many aspects, such as resume writing, interview preparation, and internship opportunity selection. Through good experience support, students can not only obtain specific operation suggestions but also have clear goals and plans to cope with career challenges and confusion.

In the examination of the impact of teacher support on students' career exploration, Hou (2013) verified that teachers' emotional and information support for students, along with guidance to enhance the ability to solve career challenges, significantly improved students' career decision-making self-efficacy. Zhang and Zhao (2018) believed that teachers' professional guidance and career counseling can help students better understand the career world and enhance their ability to solve career problems, thereby increasing career decision-making self-efficacy. Zhang (2021) discussed that the direct impact of teacher support on career decision-making self-efficacy is reflected in the feedback, encouragement, and guidance of students' career preparation behaviors. Wong, Yuen, and Chen (2021) pointed out that school teachers have a significant influence during students' career planning and decision-making processes. Teachers' positive encouragement and support not only help improve students' self-confidence but also assist them in dealing with confusion and challenges in career development, thereby promoting students' career maturity. Meanwhile, Kathryn, Ashlie, Robyn, Nelson, and Clarke's (2023) research also emphasized that educators should promote students' personal and professional growth by organizing various practical activities. Therefore, it can be seen that teacher support has a positive effect on college students' career decision-making self-efficacy and

career maturity.

2.4 Career Decision—Making Self-efficacy

Career decision-making self-efficacy refers to an individual's belief and ability to successfully complete vocational tasks. It was initially developed after Hackett and Betz (1981) applied Bandura's (1977) self-efficacy theory to the vocational field. Self-efficacy often serves as an intermediary factor for an individual to continuously perform specific behaviors or tasks, and career decision-making self-efficacy has inherited this role and become an intermediary factor affecting the process of career-related decision-making behaviors. In the research of Hackett and Betz (1981), the role of career self-efficacy in women's career decision-making is particularly important. Women's perceived career self-efficacy can increase the range of career choices and career outcomes. Taylor and Betz (1983) defined career decision-making self-efficacy as an individual's confidence in successfully completing tasks related to career decision-making. If career decision-making self-efficacy is low, it means that there is a higher likelihood of lacking the executive ability of one's own decisions. In recent years, career decision-making self-efficacy has received more attention among college students. Jiang and Feng's (2021) research shows that college students will experience compromise and decision-making during the career decision-making process, specifically formulate career goals, and make detailed future plans to achieve these goals. However, due to rapid economic development and the lack of employment positions, career decision-making self-efficacy is particularly important in helping college students cope with employment difficulties. Good career decision-making self-efficacy is an evaluation and driving factor of career behavior.

Among the constituent factors of career decision-making self-efficacy, there are four factors including goal selection, career information, problem-solving, and future planning (Oh, 2020; Taylor & Betz, 1983). Goal selection refers to an individual's ability to determine and select specific career goals during their career. Efficient goal selection means that an individual can clearly identify and pursue a career direction suitable for themselves (Baiyan, Xiaojing, Qun & Yuege, 2024). Career information involves an individual's ability to obtain and utilize career-related information. This includes understanding the requirements, working environment, salary level, and development prospects of different occupations. Mastering sufficient career information can help an individual make wiser and more suitable career decisions. Problem-solving is when an individual can effectively analyze and identify obstacles in career decision-making, formulate solutions, and implement these solutions when facing problems during the career decision-making process (Lee, 2017). Future planning is when an individual formulates long-term and short-term plans to achieve career goals. Effective future planning can help an individual move forward in an orderly manner during their career, ensuring that their career development path is clear and feasible (Byunghwa, 2020; Oh, 2020).

In previous studies, the contribution of career decision-making self-efficacy to the maturity of students' career consciousness has been confirmed. For example, in Oh's (2015) research, students with higher career decision-making self-efficacy are also more active in career exploration and other behaviors, are more planned, and have an optimistic attitude towards challenges. Kyungok and Junghee's (2021) research indicates that career decision-making self-efficacy positively affects students' career maturity. That is to say, the prerequisite for students' career maturity is to have confidence in themselves and not be afraid of difficulties and challenges. Shin and Park (2017) believe that students with strong career decision-making self-efficacy can more actively obtain and utilize career-related information and fully understand the requirements, prospects, and development paths of different careers, enabling them to make wiser and more mature decisions when making career choices.

2.5 Career Maturity

The concept of career maturity was put forward by Super (1955). In the early stage, career maturity research explored the development of adolescents' career interests. Later, it was found that career behaviors change systematically with age (Savickas, 1984). Subsequently, researchers began to conduct extensive research on the concept of career maturity. Marasaoli, Hadi, Aryani, and Nurbaiti (2024) define career maturity as the degree of preparedness in career choice or career planning. Creed and Patton (2003) claim that career maturity is a developmental concept, which is a cognitive process of understanding, planning, and choosing between the self and work of an individual. Crites and Savickas (2011) hold that career maturity is an individual's ability to improve their adaptability so as to make the right degree of preparation for self-understanding of the career. Based on the arguments of these researchers, career maturity is a developmental concept, which is related to the ability to choose a career and the degree of knowledge acquisition. Moreover, an individual's career-related preparation for the future cannot be completed in a short time. It requires a continuous development process such as human cognitive characteristics to mature.

For students, career maturity is not only related to students' career attitudes but also an important indicator for evaluating career planning education in colleges and universities, which can reflect the talent-cultivation ability of colleges and universities (Xie, 2023). Shen (2024) believes that good career planning ability of college students means that schools design curriculum content by following the demands of the talent market and adopt practical and innovative educational models. This includes strengthening project-based learning with off-campus enterprises, providing internship and training opportunities, etc., to make education closer to actual demands. Ren, Li, and Zhu (2023) think that career maturity is the specific manifestation of the organic combination of students' knowledge and skills, theory and practice in schools, and it also means the in-depth integration of school education and the industry. Therefore, career maturity can meet the actual needs of the cooperation between industrial departments and educational institutions. It has practical fundamental benefits for college students. At the same time, it means that the integration of industry and education is not only the result of the joint

efforts of education and industry but also a necessary path to promote college students' career maturity and enhance their employment competitiveness.

3. Results

Since online questionnaires can sample at a relatively low cost and are not limited to a single location, and have the characteristics of fast collection speed (Tan & Teo, 2000). Therefore, this study used the online questionnaire collection method for data collection. The questionnaire measurement all used the Likert 5-point scale, and the research purpose and objects to be confirmed in this study were explained before answering the questionnaire. After collecting the data, the SPSS 25.0 program was used for analysis. First, a reliability test was conducted, and 300 samples were analyzed. Among them, the career activity participation satisfaction used the scale in Jinhee's (2019) research as the tool of this study, with a total of 12 items, and the Cronbach α was 0.814. It was divided into 3 sub-factors, among which there were 4 items with a Cronbach α of 0.943. There were 4 items for activity instructors with a Cronbach α of 0.897. There were 4 items for facilities and environment with a Cronbach α of 0.877. Teacher support used the scale in Oh's (2015) research, with a total of 8 items. The Cronbach α was 0.930. Career decision-making self-efficacy used the scale developed by Taylor and Betz (1983) and revised by Oh (2020). It consisted of 4 factors: goal selection, career information, problem-solving, and future planning, with 12 items. Among them, there were 3 items for goal selection with a Cronbach α of 0.914. There were 3 items for career information with a Cronbach α of 0.973. There were 3 items for problem-solving with a Cronbach α of 0.941. There were 3 items for future planning with a Cronbach α of 0.989. Career maturity used the tool in Jinhee's (2019) research, consisting of 14 items in total. It was composed of 5 factors, namely, decision-making with 3 items and a Cronbach α of 0.987. Purpose had 3 items with a Cronbach α of 0.992. Confirmation had 3 items with a Cronbach α of 0.976. Preparedness had 2 items with a Cronbach α of 0.955. Independence had 3 items with a Cronbach α of 0.957. According to the description of Hair, Black, Babin, and Anderson (2009), a Cronbach α of 0.7 or above indicates good reliability of the scale. Among the demographic characteristics, in terms of gender, there were 89 male students, accounting for 29.7%, and 211 female students, accounting for 70.3%. Among the grades, there were 131 lower-grade students, accounting for 43.7%, and 169 upper-grade students, accounting for 56.3%. Among the professional categories, there were 166 students majoring in humanities and social sciences, accounting for 55.3%. There were 134 students majoring in natural sciences, accounting for 44.7%. In this study, since the questionnaire used in this study was the scale used in previous research and there were many factors and items involved, this study followed the practice of Mathieu and Farr (1991) to avoid excessive complexity in research measurement and analysis caused by too many factors under examination. The sub-factors of career activity participation satisfaction, career decision-making self-efficacy, and career maturity were combined and packaged, that is, the levels of these factors and the differences in various population

variables were comprehensively examined. Subsequently, the path influence relationships and mediation effects among various variables were tested.

3.1 Correlation and Comprehensive Statistical Analysis

Table 1. Correlation of Each Variable and Comprehensive Situation Level

Constituent	Career activity participation satisfaction	Teacher support	Career decision-making self-efficacy	Career maturity
Career activity participation satisfaction	1			
teacher support	.595**	1		
Career decision - making self - efficacy	.547**	.612**	1	
career maturity	.502**	.599**	.531**	1
average value	3.05	3.09	2.95	3.23
standard deviation	0.59	0.77	0.64	0.60
skewness	.923	.518	.725	.347
kurtosis	.914	-.161	-.111	.111

Descriptive statistical analysis was conducted to understand the level of the main variables in this study. The compared mean, standard deviation, skewness, and kurtosis are shown in Table 1. The mean value of career activity participation satisfaction is M=3.05, and the standard deviation is 0.59. The mean value of teacher support is M=3.09, and the standard deviation is 0.77. The career decision-making self-efficacy is M=2.95, and the standard deviation is 0.64. The mean value of career maturity is M=3.2, and the standard deviation is 0.60. Both the skewness and kurtosis tests show values less than 2 and -2, indicating that the data is approximately normally distributed. Career activity participation satisfaction is positively correlated with teacher support, career decision-making self-efficacy, and career maturity. Teacher support has a positive correlation with career decision-making self-efficacy and career maturity. Finally, career decision-making self-efficacy and career maturity also have a positive correlation.

3.2 Difference Analysis

In order to understand the differences of demographic variables among various factors, a t-test analysis was conducted for gender and professional category, and an ANOVA variance analysis was conducted for grade. See Table 2 for details. First, among genders, career activity participation satisfaction, career decision-making self-efficacy, and career maturity are significant, while teacher support is not significant. The career activity participation satisfaction (M=3.1) and career decision-making

self-efficacy (M=3) of females are higher than those of males (career activity participation satisfaction M=2.91 and career decision-making self-efficacy M=2.85). However, the career maturity of males (M=3.35) is better than that of females (M=3.18). In terms of grade differences, career activity participation satisfaction and career decision-making self-efficacy are statistically significant, while teacher support and career maturity are not significant. The career activity participation satisfaction of lower-grade students is M=2.97, and the career decision-making self-efficacy is M=2.86. The career activity participation satisfaction of upper - grade students is M=3.11, and the career decision-making self-efficacy is M=3.03. It can be seen that career activity participation satisfaction and career decision-making self-efficacy tend to increase with the rise of grade. Among professional categories, no statistical significance was found for each variable.

Table 2. Difference Analysis

Constituent		Career activity participation satisfaction	Teacher support	Career decision-making self-efficacy	Career maturity
Gender (M±SD)	Male(N=89)	2.91±0.42	3.01±0.53	2.85±0.39	3.35±0.53
	Female(N=211)	3.1±0.64	3.13±0.84	3±0.72	3.18±0.63
	t	-3.061**	-1.425	-2.190*	2.311*
Grade (M±SD)	senior grade(N=169)	3.11±0.66	3.16±0.88	3.03±0.73	3.24±0.72
	junior grade(N=131)	2.97±0.47	3±0.58	2.86±0.48	3.22±0.42
	t	-2.205*	1.910	2.423*	0.385
Category of specialty(M±SD)	humanities and social sciences category (N=166)	3.1±0.61	3.06±0.74	2.9±0.62	3.2±0.6
	natural sciences category(N=134)	2.98±0.56	3.13±0.8	3.02±0.67	3.27±0.61
	t	1.785	-.865	-1.634	-.946

Note. **p＜0.01，*p＜0.05.

3.3 Direct Impact

Analysis Regression analysis was conducted to test the path impact of variables, and the results are shown in Table 3. In the path where career activity participation satisfaction affects career decision-making self-efficacy, the overall regression is significant with F=126.943, β=0.547, and t=11.267, indicating a significant positive (+) impact. The descriptive power of the regression model is approximately 29.9%. In the impact on career maturity, F=100.228, β=0.502, t=10.011, and R^2 is 25.2%, showing a significant positive (+) impact. In the path analysis of teacher support affecting

career decision-making self-efficacy, the overall regression is also significant with F=178.315 (p<<0.001), β=0.612, t=13.353, and $R^2$is 37.4%. Teacher support has a significant positive (+) impact on career decision-making self-efficacy. In the impact of goal-orientation on employment preparation behavior, F=167.037, β=0.599, t=12.924, and $R^2$is 35.9%, showing a significant positive (+) impact. The results of the impact of career decision-making self-efficacy on career maturity show that F=116.901, β=0.531, t=10.812, and the descriptive power of the regression model is approximately 28.2%. Therefore, career decision-making self-efficacy can also positively (+) enhance career maturity.

Table 3. Direct Impact

Path			B	β	t	F	R2
Career activity participation satisfaction	→	Career decision-making self-efficacy.	.598	.547***	11.267	126.943	.299
Career activity participation satisfaction.	→	career maturity	.517	.502***	10.011	100.228	.252
teacher support	→	Career decision-making self-efficacy.	.513	.612***	13.353	178.315	.374
teacher support	→	career maturity	.473	.599***	12.924	167.037	.359
Career decision - making self - efficacy.	→	career maturity	.500	.531***	10.812	116.901	.282

Note. ***p＜0.001.

3.4 Indirect Impact Analysis

Table 4. Mediation Effect Analysis

path			B	S.E	β	R^2	F
Career activity participation satisfaction.	→	Career decision-making self-efficacy.	.598	.053	.547***	.299	126.943
Career activity participation satisfaction.	→	career maturity	.517	.052	.502***	.252	100.228
Career activity participation satisfaction.	→	career maturity	.311	.058	.302***	.346	78.419
Career decision-making self-efficacy.			.345	.053	.366***		
teacher support	→	Career decision-making self-efficacy.	.513	.038	.612***	.374	178.315
teacher support	→	career maturity	.473	.037	.599***	.359	167.037

teacher support			.347	.045	.439***		
Career decision-making self-efficacy.	→	career maturity	.247	.053	.262***	.402	99.927

Note. ***p＜0.001.

When career decision-making self-efficacy is incorporated into the relationship between career activity participation satisfaction and career maturity, as shown in Table 4, the β value in the impact of career activity participation satisfaction on career maturity is 0.502, with an explanatory power of 25.2% for prediction. When career activity participation satisfaction and career decision-making self-efficacy simultaneously predict career maturity, the β value of the effect of career activity participation satisfaction decreases and is significant. Secondly, when career decision-making self-efficacy is incorporated into the relationship between teacher support and employment preparation behavior, the β value of the impact of teacher support on career maturity is 0.612, and R ²=37.4. When teacher support and career decision-making self-efficacy simultaneously predict employment preparation behavior, the β value also decreases and is significant. Therefore, it can be confirmed that career decision-making self-efficacy has a partial mediating effect in the impact of career activity participation satisfaction on career maturity and in the relationship between teacher support and career maturity respectively.

4. Discussion

This study, within the context of the integration of industry and education, explores the impact of career activity participation satisfaction and teacher support on college students' career maturity and further analyzes the mediating role of career decision-making self-efficacy in this process. Firstly, to address research question 1, "What are the situations of college students' career activity participation satisfaction, teacher support, career decision-making self-efficacy, and career maturity?" In the overall situation level, the four factors of career activity participation satisfaction, teacher support, career decision-making self-efficacy, and career maturity are all at a medium-level situation. This indicates that the surveyed college students have certain positive experiences in participating in career activities and receiving teacher support, but there is still room for improvement as a whole. These results reflect the actual situation of students in terms of career development support and career maturity in the current higher education environment. Further combined with the difference analysis, female students' career activity participation satisfaction (M=3.1) and career decision-making self-efficacy (M=3) are higher than those of male students (career activity participation satisfaction M=2.91 and career decision-making self-efficacy M=2.85), while male students' career maturity (M=3.35) is better than that of female students (M=3.18). This result suggests that female students are more inclined to seek career-development opportunity resources and obtain more social support. Male students may be more clear and firm in setting and achieving career goals, thus performing better in career maturity. In terms

of grade differences, senior-grade students are better in career activity participation satisfaction (M=3.11) and career decision-making self-efficacy (M=3.03) compared with lower-grade students (M=2.97 and M=2.86 respectively). This finding indicates that as the grade increases, students' participation in career activities and career decision-making self-efficacy gradually increase. From this situation, it can be seen that with the accumulation of study and life experience, students' career resources and support gradually increase, enabling them to have a steady improvement in career decision-making ability and confidence.

Secondly, in the direct-impact analysis, it can be seen that career activity participation satisfaction has a significant positive correlation with career decision-making self-efficacy and career maturity, and can effectively influence these two factors. This finding is consistent with Jinhee's (2019) research. High-satisfaction career activities can increase students' career skills, enhance their self-awareness and career confidence, and can also promote their sense of identity and belonging to the career, enabling them to be more actively involved in career planning and development (Jeong, 2023; Kyungok & Junghee, 2021; Baiyan, Xiaojing, Qun & Yuege, 2024; Baek, Park & Kwon, 2017). The role of teacher support in enhancing college students' career decision-making self-efficacy and career maturity has also been verified, which is consistent with the research results of Oh (2015) and Wong et al. (2021), emphasizing the guiding role of teachers in students' career development. Moreover, this support is particularly significant in improving students' career decision-making self-efficacy (Zhang & Zhao, 2018). By comparing the influence of career activity participation satisfaction and teacher support on career decision-making self-efficacy, it can also be seen that the influence of teacher support (β=0.612) is higher than that of career activity participation satisfaction (β=0.547). Based on these results, research question 2 of this study, "What are the impacts of college students' career activity participation satisfaction, teacher support, and career decision-making self-efficacy on career maturity?" is answered. In terms of the impact on career maturity, teacher support (β=0.599) is better than career decision-making self-efficacy (β=0.531) and career activity participation satisfaction (β=0.502). Therefore, the importance of teacher support can be shown in these results, because its contribution is relatively excellent whether in career decision-making or career maturity.

Continuing to verify research question 3 of this study: "Do career activity participation satisfaction and teacher support indirectly affect career maturity through career decision-making self-efficacy?" In the results of the indirect impact analysis, career decision-making self-efficacy can mediate the relationships between career activity participation satisfaction and career maturity, and between teacher support and career maturity respectively. That is, in the process of career activity participation satisfaction and teacher support enhancing career maturity, part of it is achieved indirectly by enhancing students' self-confidence and decision-making ability. Just as described in the studies by Lee and Park (2019), Youn and Hyun (2019), Oh (2020), and Shin & Park (2017), career decision-making self-efficacy has an indispensable position in career development and is an important positive

psychological resource linking career-related outcomes. Combined with the previous direct impact results, although the impact of career decision-making self-efficacy on career maturity is not as great as that of career activity participation satisfaction and teacher support, it is a factor that enables the two factors to achieve indirect influence. Especially for teacher support with a relatively high contribution, this mechanism is more needed.

Finally, based on the results of this study, it can be seen that teacher support and career decision-making self-efficacy are two factors that need to be focused on. Therefore, research question 4 is addressed: "How to effectively promote college students' career maturity in the context of the integration of industry and education?" In terms of strengthening teacher support, colleges and universities should focus on the training of teachers in career guidance so that teachers can provide students with comprehensive career information and advice and strengthen teachers' career-activity services for students. For improving students' career decision-making self-efficacy, under the condition of ensuring that students have plenty of career practice opportunities, relevant educational institutions can set up activities related to the cultivation of career decision-making ability when necessary, focusing on career decision-making skills, problem-solving, future planning, etc. In addition, colleges and universities still need to promote the improvement of the school-enterprise cooperation mechanism and establish a close cooperative relationship with enterprises because the impact of career activity participation satisfaction is still significant and effective. Therefore, it is necessary to construct a student-centered career support ecosystem with the joint participation of schools, enterprises, teachers, and all sectors of society to provide students with comprehensive career support and resources, ensure that what students learn matches market demands, and help them achieve success in career development.

5. Conclusion

This study explores the impact of career activity participation satisfaction and teacher support on college students' career maturity. By introducing career decision-making self-efficacy as a mediating variable, it reveals the important role it plays in the career maturity process. Finally, from the perspective of the integration of industry and education, corresponding strategies are proposed. On the one hand, this provides a new perspective and verification for the existing career maturity theory and also offers a new framework and method for the theories in the fields of vocational education and higher education. In previous studies, although the importance of career activity participation satisfaction and teacher support for career development has been gradually verified by different researchers, there has been no combination and comparison of them. This study, while clarifying the specific impact paths and degrees of these variables, provides relevant empirical support, offering new solutions to solve the current problems such as the difficulty of graduates in finding jobs and the high early turnover rate, and helping to improve the employment quality and career development stability of

college students. However, this study also has certain limitations. For example, the sample size of the study is relatively limited and may not fully represent the situation of college students in other regions and schools. Educational resources, student backgrounds, and career development opportunities in different regions and schools may vary greatly. Moreover, the research data rely on students' self-reports, and there may be social desirability bias and recall bias. All these situations may have affected the universal results of the study. In this study, although female students' career activity participation satisfaction, teacher support, and career decision-making self-efficacy are all higher than those of male students, male students' career maturity is still higher than that of female students, indicating that the factors that play an important role in male students' career maturity have not been captured in this study. Therefore, future research can introduce other relevant factors for improving career maturity to further explore their structural relationships, and expand the sample size to improve the representativeness and robustness of the results. It can also consider combining interviews, observations, and experiments to improve the diversity and accuracy of the data.

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