

Determinants of career education by course instructors: a social cognitive perspective

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Article Info

Article history:

Received Aug 3, 2025

Revised May 26, 2026

Accepted Jun 8, 2026

Keywords:

Career education

Chinese education

Influencing factor

Major course instructor

Social cognitive career theory

ABSTRACT

Based on social cognitive career theory, this study aims to explore the mechanisms influencing the participation of Chinese university professional course teachers in career education, with a specific focus on the roles of self-efficacy, outcome expectations, and career goals. Employing a mixed-methods approach combining quantitative and qualitative research within this theoretical framework, the study systematically analyzes key variables including self-efficacy, personal capital, institutional constraints, and personality traits. The results show that: teachers' self-efficacy is positively correlated with their perceived capability to implement career education; personal capital enhances motivation to participate, while administrative and research demands constitute significant barriers; the construction of value regarding the relevance of career education strengthens intrinsic motivation that transcends formal institutional requirements; recognition of professional goals improves teaching engagement, particularly among teachers with perfectionist, helper, and achiever personality traits. The findings confirm the applicability of social cognitive career theory in the Chinese higher education context and emphasize the importance of intrinsic and personal factors in motivating teachers. The study provides policy implications for promoting comprehensive engagement in career education: there is a need to reduce administrative and research burdens while leveraging teachers' values and personal characteristics. This research extends social cognitive career theory to the Chinese educational context, revealing culturally specific predictors of teacher motivation and offering a nuanced understanding of how individual and systemic factors interact to shape engagement in career education.

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1. INTRODUCTION

The number of college graduates in China's class of 2025 is projected to reach 12.22 million, an increase of 430,000 from the previous year. However, structural contradictions persist between labor market supply and demand [1]. College students' career choices and employment mindsets face multiple challenges, giving rise to phenomena such as 'slow employment', 'delayed employment', 'passive job seeking', and even 'non-employment' [2]. The notice of the Ministry of Education on Employment and Entrepreneurship Work for the class of 2025 graduates from general colleges and universities explicitly requires higher education institutions to integrate career education into the entire process of talent cultivation. It stresses the need for

dynamic adjustment and optimization of academic disciplines and majors, introducing a red-yellow card warning system for programs with poor employment outcomes, and promptly adjusting or upgrading disciplines that no longer meet social needs. The policy further highlights the importance of strengthening the linkage between employment, admissions, and training, while optimizing enrollment planning based on educational quality and graduate employment outcomes. These measures demonstrate that graduate employment destinations are now directly tied to the survival and sustainability of academic programs within higher education institutions.

In Chinese universities, *fudaoyuan* are full-time student advisors responsible for students' academic performance, personal development, ideological and political education, and daily affairs—a role with no direct equivalent in Western higher education systems [3]. They are often described as the fourth faculty team, complementing the traditional functions of teaching, research, and administration. Traditionally, career education has been regarded as the responsibility of the *fudaoyuan*, with only limited involvement from subject-course instructors.

However, considering three key perspectives—current policy directives, the dynamic development of academic disciplines, and the growing demands of ideological and political work in higher education—it has become both a realistic necessity and an urgent requirement for subject-course instructors to engage in student career education. In practice, this means guiding students in exploring reasonable life orientations, preparing for career development, and ultimately contributing to the national talent pipeline. This expectation stands in sharp contrast to many Western contexts, where subject-course instructors' participation in career education is typically voluntary and shaped by different institutional structures and educational environments. China's employment system and talent cultivation model, with its emphasis on centralized coordination and collective responsibility, therefore, provide useful insights and reference points for the implementation of career education in other countries [4].

Why should subject-course instructors participate in career education? What factors influence their involvement? and how can their active engagement be fostered to enhance students' career readiness and employability? Addressing these questions has become an important challenge for the current higher education landscape.

2. THEORETICAL FRAMEWORK

2.1. Literature review

Research on career education in higher education institutions has been conducted from multiple perspectives. The main strands can be summarized as: first, some scholars have examined the primary actors responsible for delivering career education. Different countries adopt diverse and often collaborative approaches. In most European countries and the United States, higher education institutions have established dedicated entities such as careers centers, entrepreneurship centers, and virtual business centers. In Germany, many universities and faculties host resident professional career counsellors within their career service centers, who provide career information, employment counselling, and guidance services. The United States has a long history in this area. The career guidance movement emerged in the early twentieth century and the establishment of career centers became one of its most significant and lasting achievements. Early career centers, often located in civic communities, provided immigrants and other citizens with various social services, including career guidance. Over time, these centers were gradually incorporated into colleges, universities, and high schools. For example, the Vocations Bureau founded by Frank Parsons in 1909 was directly integrated into Harvard University [5]. Since 2014, university career service offices in the U.S. have offered a wide range of programs and services, including career counselling, career testing and assessment, classroom presentations, individualized career information, résumé and interview preparation, campus recruitment fairs, mock interviews, and online job search support.

In Australia, a government review conducted in 2008 on career development service personnel in higher education acknowledged that cultivating graduate employability is a shared responsibility among the government, universities, industry, families, and students. By introducing preferential policies, clarifying the responsibilities of different stakeholders, and implementing university–industry cooperation toolkits, the government effectively coordinated multiple actors. Universities are also required to integrate workplace learning with classroom education, ensuring that students have opportunities to participate in internships and are encouraged and supported in career exploration [6]. Typical university career development services include individual career counselling, career decision-making support, various forms of career education (individual, group-based, or embedded in curricula), employer liaison events, and the dissemination of career information through multiple media [7]. In Singapore's higher education system, all polytechnics and institutes of technical education have established career service centers, offering career counselling and guidance courses of 40 to 60 hours that are available to all students. In addition, students are encouraged to take part in a range of career experience and consultation activities, such as company visits, seminars with

industry representatives and alumni, internships, and career fairs. With regard to the teaching workforce, universities in countries such as the United States and the United Kingdom generally employ a team of highly specialized full-time and part-time career education professionals [8]. In contrast, career education in Chinese universities is mainly managed by employment departments, with teaching staff largely composed of counsellors, departmental administrative personnel, and only a small number of full-time professionals. This workforce often faces challenges such as limited specialization, lack of stability, and insufficient professional development. Consequently, the professionalization and specialization of career education teachers in Chinese higher education urgently require stronger policy support [9].

Second, some scholars emphasize the beneficial role of teachers in providing career education to students. Teachers' behaviors shape students' perceptions and understanding of educational goals, which in turn influence their goal orientations [10]. Therefore, in the process of professional teaching, instructors are encouraged to embrace the idea of broad employment education by integrating career education into their disciplinary teaching. This not only helps clarify the application of knowledge within professional fields but also guides students in positioning themselves appropriately in the job market and finding a balance between ideals and reality. Teachers and school administrators should therefore take an active role in initiating career exploration activities while students are still studying [11]. Professional instructors exert a substantial influence on students' employment outlooks: 80% of students reported that professional courses and teachers had the greatest impact on them [12]. It is thus necessary to continuously strengthen professional instructors' awareness of the importance of career planning education. As the saying goes, teaching benefits both teachers and students—teachers play a crucial role in transmitting knowledge, shaping values and mindsets, and guiding the development of skills and competencies. Moreover, the personal charisma and professional expertise of subject-course instructors make their career planning education more persuasive and credible. Encouraging all instructors to fully recognize the importance of career planning education for university students is therefore of great significance [13]. Studies have shown that anxiety linked to career uncertainty and precarious employment conditions may compel students to migrate or stagnate in education [14]. Recent studies have shown that intolerance of uncertainty can exacerbate career decision making difficulties through increased anxiety, particularly among college students [15]. Research indicates that students with clearly defined career expectations often experience greater educational and occupational success later in life, particularly for disadvantaged individuals [16]. Teacher support was crucial for adolescents' career decision-making in developing economies [17].

Third, some scholars have conducted research on the construction of the career planning teaching workforce. Strengthening faculty development and building a professionalized team are regarded as essential to the success of career education. International practices in this area mainly include: i) establishing entry standards for career education instructors; ii) supporting schools in building and training full-time and part-time career education teams; and iii) enhancing training programs to promote the professionalization of career educators. In the United Kingdom, these efforts focus on two aspects. First, an entry system for career education instructors has been established. In secondary schools, two main categories of personnel are involved in career education which are career coordinators, who are responsible for managing career education within schools and careers advisers, who provide career guidance services externally. The career strategy issued in 2017 requires every secondary school to appoint a career leader to take responsibility for leadership, management, coordination, implementation, and network-building related to career education [18]. The United Kingdom government has also set entry standards for these two groups. For example, the Career Development Institute developed a Certificate in Careers Leadership for Career Leaders, which corresponds to Level 6 of the United Kingdom Qualifications and Credit Framework [19]. Careers advisers, meanwhile, are required to hold a qualification in career development or a diploma in career guidance and development [20]. Second, the United Kingdom places strong emphasis on the training of career education staff, recognizing it as essential to improving the quality and sustainability of career services [20]. In the United States, The American School Counselor Association (ASCA) was established in 1952 to promote the appointment of school counsellors in public schools, providing comprehensive, developmental guidance services for all students. These services aim to support student success in academic, career, personal, and social development. Over the years, ASCA has developed clear training standards and a qualification system for school counsellors. The first National Certified School Counselor credential was introduced in 1992. In 1997, ASCA released the National Standards for School Counseling Programs, covering three core areas (academic development, career development, and personal/social development). Building on these standards, ASCA issued The ASCA National Model: A Framework for School Counseling Programs in 2003 [21].

Fourth, career education has also been examined within the institutional framework of China's distinctive Sanquan Yuren (all-staff, whole-process, all-round education) system. Scholars argue that major course instructors, with their deeper familiarity with industry contexts, exert a subtle yet significant influence on students. This unique advantage enables them to play an indispensable role in career guidance and makes

them an important part of the mentorship system. Similarly, Chaaban *et al.* [22] stress the need for stronger collaboration between university counsellors and major course instructors to foster a collective educational effort. They recommend clearly defining shared responsibilities between counsellors and professional instructors. Since students are the primary subjects of ideological and political education in universities, both counsellors and instructors are expected to provide patient and professional guidance in areas such as moral character, mental health, academic learning, research skills, career planning, professional competence, and coping with personal difficulties.

In sum, previous studies have examined the actors of career education at home and abroad, the beneficial role of professional instructors, the development of the career planning teaching workforce, and broader issues of career education in Chinese higher education. However, few studies have focused specifically on the role of major course instructors in career education, and even fewer have undertaken in-depth analyses of the factors shaping their involvement. To address this gap, the present study investigates the key factors influencing major course instructors' engagement in career education.

2.2. Social cognitive career theory

Social cognitive career theory was first proposed by American scholar Robert Lent and colleagues in 1994. Drawing on the triadic reciprocal causation framework of social cognitive theory and building on the three core concepts of self-efficacy expectations, outcome expectations, and career goals, social cognitive career theory incorporates individual and environmental factors to construct a systematic model of career development. The theory places particular emphasis on three aspects: the formation of career interests, the realization of career choices, and the attainment of career performance [23].

Self-efficacy expectation refers to an individual's belief in their ability to perform career-related behaviors successfully, that is, one's personal conviction about whether they can effectively accomplish occupational tasks. Within social cognitive career theory, self-efficacy is understood as dynamic and context-specific self-belief, closely tied to actual performance activities such as learning or work tasks, rather than as a static or generalized perception [24]. Outcome expectation refers to an individual's anticipation of the likely consequences of engaging in career-related behaviors, essentially asking "If I do this, what will happen?" [25]. Whereas self-efficacy expectations focus on beliefs about one's ability to carry out behaviors, outcome expectations emphasize anticipated results. These can include social outcomes (e.g., impacts on family), material outcomes (e.g., financial income), and self-evaluative outcomes (e.g., gaining self-recognition) [26]. Career goals describe an individual's tendency to pursue certain academic or occupational activities or to achieve particular academic or career-related outcomes. Social cognitive career theory distinguishes between choice goals, which indicate the types of occupational activities an individual intends to pursue, and performance goals, which specify the level of achievement they aspire to reach within a chosen field. Goals are considered to exert a significant guiding influence on behavior, providing direction and motivation in one's career development [27], [28].

2.3. Influencing factors on major course instructors' participation

The three core concepts of social cognitive career theory—self-efficacy, outcome expectations, and career goals—provide a useful framework for investigating the factors influencing major course instructors' participation in college students' career education. Self-efficacy in this context refers to instructors' beliefs about their competence in carrying out career education tasks. This is examined through personal characteristics such as highest academic degree, overseas study experience, and mentorship roles, which may differentially affect their sense of self-efficacy. Outcome expectations concern what instructors anticipate gaining from their involvement in career education. This includes their perceptions of the relationship between career education and professional education, their attention to students' employment outcomes, and their understanding of how career education relates to student employability. Career goals pertain to instructors' willingness to participate in career education and their expectations regarding related outcomes. This is assessed by considering the perceived importance and urgency of career education in their work, as well as the influence of individual personality traits. By clarifying the influence mechanisms of these factors—self-efficacy, outcome expectations, and career goals—this study aims to provide insights to encourage major course instructors' active engagement in career education and thus support students' holistic development.

2.4. Research hypotheses

Hypothesis 1 is about teachers' self-efficacy is positively associated with their perceived competence in career education, as influenced by factors such as academic qualifications, overseas study experience, mentorship roles, and self-assessed ability in career planning instruction. Hypothesis 2 is about teachers' outcome expectations are positively associated with their enthusiasm for career education, reflected in their understanding of its relation to professional education, concern for students' employment outcomes,

and perception of its link to employability. Hypothesis 3 is about teachers' career goals are positively associated with their competence in career education, as indicated by the perceived importance and urgency of career education in their work and by individual personality traits.

3. METHOD

3.1. Source of questionnaire data

This study employs mixed-methods research design. First, through purposive sampling, over 30 core-course instructors from a university in Beijing were selected for semi-structured interviews to identify key factors influencing their participation in career education. Based on the interview results and literature review, a preliminary questionnaire was developed. Subsequently, the preliminary questionnaire underwent expert review and a small-scale pilot test, and was revised to optimize its structure, resulting in the final questionnaire on factors influencing professional teachers' participation in career guidance.

In the sampling phase, a stratified sampling strategy was adopted to ensure the sample covered different types of higher education institutions. The sampling framework was first stratified according to affiliation (municipal/Beijing-based vs. ministry-affiliated), institution type (comprehensive vs. specialized), and institutional tier (double first-class vs. regular undergraduate institutions). Within each stratum, eligible professional course instructors were randomly invited to participate in the survey through administrative channels or faculty directories at their respective institutions, with the final sample size dependent on voluntary participation.

The survey targeted instructors from seven major academic fields: humanities, management, economics, law, natural sciences, engineering, and agriculture. Data was collected via the online survey platform Questionnaire Star, yielding 307 valid responses. The valid sample encompasses diverse affiliations, institution types, institutional tiers, and academic disciplines, demonstrating good structural diversity and providing a reliable data foundation for subsequent analysis.

3.2. Survey questionnaire validation

This study employed homogeneity reliability, specifically Cronbach's alpha coefficient, to examine the internal consistency of the questionnaire. The reliability analysis of the items yielded a coefficient of 0.766, indicating good reliability. The study first conducted an exploratory factor analysis, along with Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) test. The sphericity test showed a significance level of 0.000, and the KMO value was 0.832, suggesting that the items explain a substantial portion of the information related to this variable.

3.3. Descriptive statistics

The demographic distribution of the surveyed instructors shows considerable variability. The gender ratio is relatively balanced, with slightly more males. Most instructors are aged 31-50, and those with 6-10 years of work experience form the largest group. About 58% hold a master's degree, 68% lack overseas study experience, and 80% entered higher education directly after graduation. Lecturers and associate professors constitute the majority, with lecturers accounting for over half. Over half teach 6-10 classes per week. Similar proportions have served as class advisors or counselors, while fewer are doctoral supervisors. Many also serve as undergraduate supervisors or hold no mentorship role. Most have no administrative experience, though around 70% have led or plan to lead funded projects. Roughly 60% lack industry part-time work, and half have no entrepreneurial project experience. Notably, 83% have received career education training.

Regarding perceptions of career education, instructors reported high agreement: the mean score for its complementarity with professional learning was 4.37, and for its benefit to students' learning, 4.50. The importance of career education in their duties was moderate ($M=3.47$). Departmental feedback on employment outcomes was limited ($M=2.60$). Teachers showed strong concern for students' employment ($M=4.41$), with outcomes influencing them to a notable extent ($M=3.72$). Employment rates moderately affected their initiative to engage in career education ($M=3.76$).

4. RESULTS AND DISCUSSION

4.1. Hypothesis testing

4.1.1. Hypothesis 1

Teachers' self-efficacy is positively correlated with their perceived competence in participating in career education. Self-efficacy was operationalized through personal characteristics influencing it, such as highest academic degree, overseas study experience, mentorship roles, and the self-assessed ability to

conduct career planning education. Highest academic degree significantly affects teachers' perceptions of the necessity, effectiveness, and competence in delivering career education. Teachers holding a master's degree scored higher than those with a doctoral degree in recognizing the necessity ($T=2.520$, $p<0.05$), effectiveness ($T=2.796$, $p<0.01$), and competence ($T=3.744$, $p<0.001$) of career education conducted by major course instructors as reflected on Table 1.

Table 1. The impact of academic degrees on perceptions of the necessity, effectiveness, and competence of major course instructors conducting career education

Education level	N	Mean (M)	Standard deviation	Test results
Master's degree	307	8.47	1.211	$T=2.520>PhD$ * (perceived necessity)
	307	8.02	1.498	$T=2.796>PhD$ ** (perceived effectiveness)
	307	7.95	1.516	$T=3.744>PhD$ *** (perceived competence)

Experience in holding administrative positions has a significant impact on teachers' subjective feelings about students securing better job opportunities ($T=3.741$, $p<0.001$) and on their perceived competence in conducting career education ($T=-2.690$, $p<0.01$). Specifically, teachers with administrative roles reported higher subjective satisfaction when the students they supervised obtained better employment opportunities. However, these teachers demonstrated lower perceptions of major course instructors' competence in delivering career education compared to those without administrative experience.

Whether teachers have led or plan to lead externally funded projects has a significant impact on how students' employment outcome rates influence their initiative in career education ($F=3.825$, $p<0.01$). Post-hoc comparisons reveal that teachers planning to lead projects exhibit lower initiative compared to the other three groups (mean difference with those who have led projects= 0.418 , $p<0.01$; mean difference with those currently leading projects= 0.530 , $p<0.05$; mean difference with those who have led projects= 0.259 , $p<0.05$). In other words, those planning to lead projects are more susceptible to being influenced by variations in employment rates.

Overseas study experience has a significant impact on teachers' perceptions of the necessity ($F=8.222$, $p<0.001$), effectiveness ($F=7.500$, $p<0.001$), and competence ($F=5.924$, $p<0.001$) of major course instructors conducting career education. Post-hoc comparisons show that, regarding necessity, teachers without overseas study experience scored higher than those with overseas doctoral (mean difference= 1.241 , $p<0.001$) and visiting scholar experiences (mean difference= 0.947 , $p<0.05$). In terms of perceived effectiveness and competence, teachers with overseas master's experience and those without any overseas experience scored higher than those with overseas doctoral and visiting scholar experiences.

The status of serving as an academic advisor has a significant impact on perceptions of the necessity ($F=5.849$, $p<0.001$), effectiveness ($F=5.084$, $p<0.01$), and competence ($F=4.718$, $p<0.01$) of professional course instructors in delivering career education. According to post-hoc comparisons, in terms of perceived necessity and competence, teachers who serve as undergraduate advisors or do not serve as advisors scored higher than those advising master's or doctoral students. For perceived effectiveness, both undergraduate advisors (mean difference= 0.629 , $p<0.05$) and those without advisory roles (mean difference= 0.703 , $p<0.01$) scored higher than master's student advisors. Additionally, undergraduate advisors (mean difference= 1.361 , $p<0.05$) also scored higher than doctoral student advisors.

In summary, hypothesis 1 is partially supported. Indicators of teachers' self-efficacy—such as holding a master's degree, having no overseas study experience, and serving as undergraduate advisors—are significantly associated with higher perceived competence in delivering career education, thus supporting the theoretical framework of self-efficacy. However, other factors such as administrative roles and plans to lead horizontal research projects reveal more complex patterns, suggesting that self-efficacy is influenced by multiple dimensions, possibly shaped by professional roles and career development stages.

4.1.2. Hypothesis 2

The more positively professional course instructors perceive the relationship between career education and disciplinary education, and the more concerned they are about students' employment destinations, the more they recognize the positive role of career education in student employment. Consequently, they tend to be more actively involved in career education.

Perceptions of the relationship between career education and disciplinary education have a significant impact on instructors' recognition of the necessity ($F=14.384$, $p<0.001$), effectiveness ($F=19.714$, $p<0.001$), and competence ($F=17.325$, $p<0.001$) in implementing career education. According to post-hoc comparisons, in terms of necessity, those who believe that career education and disciplinary education are highly complementary report significantly higher perceptions than those who believe they are moderately

complementary (mean difference=0.865, $p<0.001$) or have little relationship (mean difference=2.053, $p<0.001$). Those who view the two as moderately complementary also scored higher than those who believe the relationship is weak (mean difference=1.188, $p<0.05$). Regarding effectiveness and competence, respondents who perceived a strong complementary relationship between career education and disciplinary education rated both aspects significantly higher than those who saw them as moderately complementary (effectiveness: mean difference=1.175, $p<0.001$; competence: mean difference=1.080, $p<0.001$) or were uncertain (effectiveness: mean difference=2.117, $p<0.001$; competence: mean difference=1.795, $p<0.01$). These findings suggest that the greatest differences across the three variables occur between those with strong recognition and those who are uncertain about the relationship.

Perceptions of whether career planning benefits students' academic learning have a significant impact on professional course instructors' recognition of the necessity ($F=16.726$, $p<0.01$), effectiveness ($F=12.081$, $p<0.001$), and competence ($F=12.150$, $p<0.001$) in implementing career education. In all three dimensions, respondents who believed that career planning is highly beneficial to students' academic learning reported significantly higher scores than those who believed it is somewhat related or were unsure. In terms of necessity, the group that perceived career planning as beneficial also scored higher than the 'unsure' group (mean difference=1.179, $p<0.05$). These results suggest that the more value instructors place on career education, the more they recognize its necessity and effectiveness, as well as their own competence in delivering it.

The degree of attention paid to students' employment outcomes significantly influences professional course instructors' perceptions of the necessity ($F=5.941$, $p<0.01$), effectiveness ($F=10.291$, $p<0.001$), and competence ($F=9.627$, $p<0.001$) regarding their engagement in career education. According to the post-hoc comparison results, in all three aspects, respondents who were highly concerned about students' employment outcomes reported significantly higher recognition of the effectiveness of career education than those who were moderately concerned (mean difference in necessity=0.770, $p<0.001$; in effectiveness=1.097, $p<0.001$; in competence=0.975, $p<0.001$).

Perceptions of whether career planning facilitates students' successful transition after graduation significantly influenced professional course instructors' perceptions of the effectiveness ($F=13.062$, $p<0.001$) and competence ($F=14.117$, $p<0.001$) in implementing career education. In terms of necessity, instructors who believed that career planning is highly beneficial reported significantly higher perceptions than those who considered it somewhat beneficial (mean difference=1.079, $p<0.001$) and those who were uncertain (mean difference=2.311, $p<0.001$). Instructors who viewed career planning as somewhat beneficial also scored higher than those who were uncertain (mean difference=1.231, $p<0.01$). Regarding effectiveness, those who perceived career planning as highly beneficial scored higher than those who considered it somewhat beneficial (mean difference=1.117, $p<0.001$) and those who were uncertain (mean difference=1.817, $p<0.001$). In terms of competence, instructors who viewed career planning as highly beneficial reported significantly higher competence than those who considered it somewhat beneficial (mean difference=0.977, $p<0.05$), those who were uncertain (mean difference=2.137, $p<0.05$), and those who believed it to be unhelpful (mean difference=2.708, $p<0.05$). Additionally, the somewhat beneficial group scored higher than the uncertain group (mean difference=1.160, $p<0.05$).

Based on the above results, hypothesis 2 is supported: the more positive teachers' perceptions are regarding the relationship between career education and professional education, as well as the greater their attention to students' employment outcomes and belief in the benefits of career education for student employment (i.e., stronger outcome expectations), the higher their enthusiasm for participating in career education, as reflected in their recognition of its necessity, effectiveness, and their own competence.

4.1.3. Hypothesis 3

The higher the perceived importance and urgency of career education in teachers' work, the more conducive it is to their implementation of career education, with individual personality traits serving as additional indicators, as in Table 2. Different types of career education tasks within teachers' work significantly influence their perceived competence in implementing career education ($F=10.875$, $p<0.001$). According to post-hoc LSD comparisons (Table 2), groups that regard career education as both important and urgent or important but not urgent have significantly higher perceptions of competence than groups who consider it important but not urgent (mean difference=0.749, $p<0.05$), not important but urgent (mean difference=2.029, $p<0.05$), and neither important nor urgent (mean difference=2.129, $p<0.05$). Furthermore, the group viewing career education as important but not urgent scores higher than those who see it as not important as urgent (mean difference=1.280, $p<0.05$) and neither important nor urgent (mean difference=1.380, $p<0.05$).

Table 2. Post-hoc LSD comparisons of the effect of work task types on professional teachers perceived competence in implementing career education

Dependent variable	(I) Perception	(J) Perception	Mean difference (I-J)	Standard error
Ability	Important and urgent	Important but not urgent	.749*	.199
		Not important but urgent	2.029*	.642
		Not important and not urgent	2.129*	.541
	Important but not urgent	Not important but urgent	1.280*	.648
		Not important and not urgent	1.380*	.548

Note: * $p < 0.05$.

Participants' personality traits have a significant impact on their perceptions of the effectiveness ($F=5.175$, $p<0.001$) and competence ($F=4.311$, $p<0.001$) of professional teachers implementing career education. Regarding effectiveness, there is no significant difference between the leader and peacemaker types, but both groups show significantly lower perceptions compared to perfectionists, helpers, achievers, artistic types, intellectual types, and loyal types. Additionally, the leader type scores lower than the happy type. In terms of competence, the peacemaker type scores significantly lower than the perfectionists, helpers, achievers, intellectual, and happy types. The intellectual and loyal types score lower than the perfectionists, and the artistic type scores lower than the achievers.

In summary, hypothesis 3 is partially supported. Career goals, as reflected by the perceived importance and urgency of career education, are positively correlated with teachers' self-assessed competence in delivering career education. That is, the more teachers perceive career education as important (regardless of urgency), the higher they rate their own ability to conduct it. The influence of personality traits is more complex. Certain traits, such as perfectionists, helpers, and achievers, tend to have higher evaluations of effectiveness and competence, while leader and peacemaker types show significantly lower ratings.

4.2. Discussion

Hypothesis 1 assessed the relationship between self-efficacy and perceived ability. Hypothesis 1 is partially supported: self-efficacy is generally positively correlated with perceived competence in career education, though shaped by multiple factors. Teachers with a master's degree reported higher perceptions of necessity, effectiveness, and ability than those with a doctorate, likely due to closer involvement in undergraduate teaching and clearer personal career trajectories. Undergraduate supervisors also rated career education more positively, reflecting their direct engagement with students' employment outcomes, which reinforces self-efficacy. By contrast, teachers with administrative duties reported higher satisfaction with student employment but lower perceived ability, suggesting that administrative workloads may constrain professional growth in career education.

Hypothesis 2 assessed the outcome expectations as a driver of participation. Hypothesis 2 is supported, confirming that outcome expectations strongly motivate participation, consistent with social cognitive career theory. Teachers who view career education as complementary to disciplinary teaching and beneficial for students' development show more positive attitudes. Greater concern for employment outcomes and stronger belief in career education's role in job placement further enhance willingness to invest effort in this domain.

Hypothesis 3 assessed career goals and career education ability. Hypothesis 3 is partially supported: occupational goal orientation toward career education is positively associated with perceived competence, though personality traits complicate the relationship. Teachers who regard career education as important (urgent or not) report higher self-efficacy and engagement. Personality also matters as perfectionists, helpers, and achievers rate their ability higher, likely due to responsibility, pursuit of excellence, and willingness to support others. Conversely, leaders and peacekeepers show lower perceptions, possibly because leadership emphasizes macro-level management and peacekeeping favors stability over proactive engagement in career education.

4.3. Path analysis

Based on the above findings, this study proposes the following pathways to enhance professional course teachers' participation in career education:

4.3.1. Strengthening self-efficacy through demonstration of effectiveness

Career planning, as an applied discipline integrating management and psychology, requires high standards for instructors [29]. There is a relationship between teacher self-efficacy and student performance and behaviors. Yet, many professional teachers lack systematic training despite being familiar with industry trends. To enhance self-efficacy, three measures are suggested: first, publicize the achievements of career education, highlighting the role of undergraduate tutors to increase teachers' sense of value; second, establish

feedback mechanisms so teachers can directly perceive the impact of their guidance on student employment; third, encourage participation in industry-related projects, enabling teachers to integrate frontline insights into career education and improve its quality and relevance.

4.3.2. Enhancing outcome expectations to sustain participation

Timely dissemination of policy documents emphasizing the integration of career education throughout the talent cultivation process is necessary. Promoting the deep integration of disciplinary and career education can also strengthen teachers' sense of mission. With specialized employment markets, teachers' familiarity with industry trends and competency requirements positions them to provide targeted and persuasive guidance. International examples, such as Kyoto University where professors serve as employment officers, illustrate effective models. As career planning is a continuous process, professional teachers can leverage disciplinary expertise to guide students in understanding employment directions and adapting proactively [30].

4.3.3. Stimulating motivation through organizational incentives

According to social exchange theory, organizational support enhances employees' performance and commitment. Schools should integrate career education into title evaluations, workload, and performance appraisals, while rewarding teachers with strong participation and effectiveness through funding and policy support. Appointing professional teachers as employment mentors and formally recognizing related work can further motivate engagement [31]. Incentive practices in Korean universities, such as research points at Ewha Woman's University or subsidies at Konkuk University, also offer useful references. In addition, systems like undergraduate mentorship and class advisorship can broaden teachers' career horizons and enhance their educational capacity. Schools should gradually develop supportive policies, encourage professional teachers to design discipline-specific career courses, and adopt tiered teaching models to meet diverse student needs.

5. CONCLUSION

Based on social cognitive career theory, this study systematically examined the influencing mechanisms of professional course teachers' participation in career education in Chinese higher education institutions. It revealed the complex interaction paths of three core factors: self-efficacy, outcome expectations, and career goals. The findings are: i) teachers' accumulation of personal capital (such as higher academic degrees, international experience, and mentorship roles) significantly enhances their self-efficacy in conducting career education, while administrative duties and research pressures may cause role conflicts; ii) teachers' cognitive construction of the value of career education (e.g., promoting the integration of professional knowledge and career development, improving employment quality) stimulates more sustained engagement than institutional mandates; and iii) the Chinese policy of 'whole-person education' contrasts with the Western model of voluntary participation, indicating that cultural context plays a key moderating role in teacher role identity.

By applying the social cognitive career theory framework to higher education, this study offers four practical insights for university administrators. First, institutions should establish a differentiated training system for teachers' career education competencies, with a focus on supporting young teachers and those lacking international experience. Second, institutions should reform evaluation mechanisms to include career education outcomes as indicators in professional title appraisals. Third, institutions should develop integrated 'professional education-career development' curriculum templates to reduce the institutional transaction costs associated with teacher participation. These findings provide policy references for other countries aiming to strengthen vocational education while maintaining academic rigor. Fourth, from a policy perspective, China's experience demonstrates that in a research-performance-oriented academic environment, administrative directives alone are insufficient to sustain high-quality career education. It is recommended to refine an 'incentive-compatible' support system, such as including career education in teaching workload calculations, establishing departmental career education communities, and incorporating graduate employment quality into discipline assessment metrics. This institutional empowerment-professional development dual-drive model offers innovative governance insights for countries and institutions undergoing similar transitions.

FUNDING INFORMATION

This article is supported by Beijing International Studies University School-level Research Special Project: "Empirical Study on the Influencing Factors of Professional Teachers Career Education under the Concept of Three-all Education" (Project No. KYZX23A034).

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
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C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [WS], upon reasonable request.

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