



Career calling and academic engagement among pre-service teachers: The roles of intention to choose teaching as a career and gender

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Abstract: This study investigates the association between career calling and academic engagement of pre-service teachers, examining the mediating role of the intention to choose teaching as a career (ICTC) and the moderating role of gender. The sample comprised 20,327 pre-service teachers (26.10% male, 73.90% female), who completed measures of career calling, ICTC, and academic engagement. Results from the moderated mediation analysis revealed that higher career calling was associated with academic engagement, with ICTC mediating this relationship to be stronger. Furthermore, gender moderated both the direct path from career calling to academic engagement and the path from career calling to ICTC. Specifically, the influence of career calling on ICTC and academic engagement was stronger in male than in female pre-service teachers. These findings support the propositions of social cognitive career theory, suggesting that learning experiences (career calling) influence performance outcomes (academic engagement) via career goal choice (ICTC), with gender also playing a critical role in this process. Practical implications of these findings include a need for pre-service teacher education programs to prioritize fostering student teachers' career calling and ICTC in gender sensitive ways which would bolster academic engagement.

Keywords: pre-service teachers; career calling; academic engagement; intention to choose teaching as a career (ICTC)

Introduction

Teacher quality is vital to both student achievement and a country's overall educational advancement (OECD, 2019). Following Feiman-Nemser (2001), teacher professional growth is viewed as an ongoing process extending from initial training through career practice. Within this, the early stage serves as a pivotal window for shaping professional self-conception, where the caliber of early academic engagement fundamentally influences later development. Existing literature underscores how academic engagement contributes to the academic literacy and practical competencies of teacher candidates (Peng & Zhang, 2024). While the facilitative role of career calling in fostering academic engagement has garnered significant attention, empirical research focusing on pre-service teachers remains limited. Furthermore, it has yet to be fully elucidated how career calling and the intention to choose teaching as a career (ICTC) influence academic engagement, and whether these associations vary by gender. Aiming to fill these research voids, this inquiry investigates the effect and internal processes by which career calling shapes academic engagement in the Chinese context.

Career calling and academic engagement

Career calling manifests through a deep-seated orientation toward purpose, significance, and altruistic values (Dik & Duffy, 2009). Several studies indicate that career calling enhances academic satisfaction (Duffy et al., 2011) and mitigates academic burnout (He et al., 2023). Individuals driven by a calling typically exhibit heightened vitality, commitment, and concentration during their studies (Schaufeli et al., 2002), leading to enhanced levels of academic engagement. This would be true of pre-service

teachers' academic engagement facilitates their future professional growth and personal achievement (Huang & Zhang, 2024).

Moreover, individuals with strong career calling frequently experience heightened positive emotions, such as passion, purposefulness, and meaning (Beloborodova & Leontiev, 2024). In this regards, Izadpanah and Rezaei (2022) and Zhao et al. (2021) found that academic enthusiasm serves as a positive predictor for learner engagement. Zhang et al. (2021b) reported a profound correlation linking positive emotional states with academic engagement. Extant research also indicates that home-country sentiment is a significant predictor of university students' academic engagement (Huang & Yuan, 2025), and a sense of mission-driven responsibility is closely associated with their learning gains (Zhang et al., 2021a).

The mediating role of intention to choose teaching as a career

ICTC can be defined as a willing to try and the effort to perform teaching behaviors (Ajzen, 1991). Specifically, individuals who maintain consistent value systems, explicit vocational objectives, and precise foresight regarding occupational paths exhibit a higher propensity for proactive participation in educational endeavors (Jain & Sullivan, 2020). Research indicates that persons possessing elevated degrees of career choice intentions demonstrate superior academic aspirations coupled with a stronger commitment to self-improvement; such individuals also tend to immerse themselves more actively in developmental tasks pertaining to prospective careers (Yau et al., 2022). Additionally, empirical evidence suggests that personal goals can predict engagement in scientific



research among students in compulsory secondary education (Membiela et al., 2023).

The moderating role of gender

Generally, societies tend to encourage males to pursue high-status, well-compensated professions and expect them to demonstrate greater competitiveness and autonomy in academic and professional domains (Leaper, 2015). However, females are more frequently socialized into collaborative and supportive roles and steered toward stable careers like teaching, which are perceived as compatible with familial responsibilities.

Such gender differences might act as moderators in the link between career calling, ICTC, as well as academic engagement for males or females. Within the cohort of pre-service teachers, females dominate numerically, resulting in a pronounced gender imbalance. This demographic skew may amplify the interplay between gender and pre-service teachers' career development. Research has demonstrated that the link between cognitive emotion regulation as well as academic buoyancy is subject to gender differences (Asghari et al., 2026). Additionally, the connection between career commitment and academic engagement is often shaped by gender (Wang & Zhang, 2024), where the correlation between these two constructs appears more robust in males than in females (Eccles, 2009). Gender-specific socio-cultural inclinations lead individuals to engage in learning activities differently, dynamically adjusting their career expectations based on experiential feedback. This developmental process further diversifies ICTC across genders, subsequently influencing their academic engagement levels (Chen et al., 2024). Consequently, both the link connecting career calling to academic engagement and the mediating role of ICTC may be subject to gender-based moderation.

Theoretical basis

Drawing upon the framework established by Lent et al. (1994), social cognitive career theory (SCCT) stands as a comprehensive paradigm for interpreting vocational advancement. This theory elucidates the processes and mechanisms through which individuals select career goals and achieve performance outcomes. In recent years, SCCT has garnered significant scholarly attention and has been extensively applied within the fields of psychology and education (Zalazar-Jaime et al., 2023; Zhang et al., 2021c). Specifically, the theory maintains the notion that individuals' learning experiences shape their performance outcomes, with career goal selection serving as a pivotal link in the "learning experience–performance outcome" chain. Furthermore, gender, as a crucial person variable, influences career development through its interaction with the socio-cultural environment. For instance, socialization processes can lead boys and girls to develop distinct levels of self-efficacy, outcome expectations, and vocational interests regarding gender-typed activities (Moosa & Bhana, 2020). Accordingly, career calling—as a form of learning experience—influences performance outcomes (i.e., academic engagement) via career goal selection (i.e., ICTC), with gender potentially acting as a moderator.

In summary, SCCT provides an integrative theoretical framework for the current study.

The China context

In China, specific cohort of student teachers received state-sponsored, tuition-free education programs designed for targeted career placement. More importantly, their career calling within the framework of Chinese collectivism presumes a profound sense of summons and responsibility or a high degree of identification with national strategies and social well-being. Specifically, this "home-country sentiment" (*jiaguo qinghuai*) would inculcate a sense of trust inherent in being selected and entrusted with significant mandates which would drive sustained academic engagement. Nonetheless, the presumptions remain to be empirically tested. Recent research indicates ongoing hurdles in teacher preparation, such as intensifying burnout (Varol et al., 2024) and a decline in engagement (Ryan et al., 2025). Consequently, examining the academic engagement of pre-service teachers and its predictors holds substantial academic and practical significance.

Goals of the study

This research investigates how pre-service teachers' career calling influences their academic engagement, considering the mediating impact of ICTC alongside the moderating influence of gender (see Figure 1). Grounded in this theoretical framework, we hypothesize that:

H1: Higher career calling is associated with academic engagement.

H2: ICTC mediates the relationship between career calling and academic engagement for higher academic engagement.

H3: Gender moderates both the direct effect of career calling on academic engagement and the mediating effect of ICTC, such that these associations are stronger for male pre-service teachers than for females.

Methods

Sources of data

This research utilized information gathered through the nationwide large-scale China Pre-service Teacher Development Survey Project (CPTDSP). The sample of 20,327 comprised 5306 males (26.10%) and 15,021 females (73.90%). In terms of college preparation stage, the participants included 7449 freshmen (36.65%), 5036 sophomores (24.77%), 4887 juniors (24.04%), and 2955 seniors (14.54%).

Measures

Career calling scale

To assess career calling, we utilized the 11-item scale established by Zhang et al. (2015). The instrument evaluates three core dimensions: guiding force (e.g., "I feel that a kind of intangible power impels me to pursue my career"), meaning and purpose (e.g., "I want to find the meaning of my existence in my career"), and altruism (e.g., "I want to be engaged in an occupation that is beneficial to others"). Respondents indicated their agreement using a 5-point Likert response format; higher values denote a stronger career calling. Confirmatory factor analysis supported the tri-dimensional structure, with

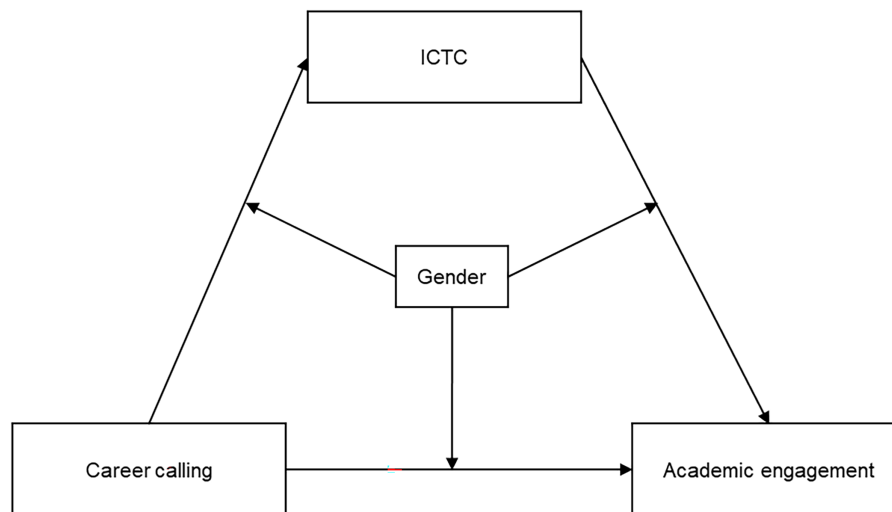


Figure 1. Hypothesized model

fit statistics as follows: $\chi^2/df = 70.472$, CFI = 0.986, GFI = 0.977, TLI = 0.980, RMSEA = 0.058, and SRMR = 0.027. These figures generally indicate an acceptable model fit, barring the χ^2/df ratio. Since χ^2/df is notoriously influenced by large sample sizes (Fan et al., 1999), this minor deviation is acceptable within the context of our data. Moreover, this assessment demonstrated robust internal consistency (Cronbach's $\alpha = 0.925$).

Academic engagement scale

Academic engagement was measured via the 29-item scale developed by CPTDSP (Li et al., 2024), comprising three dimensions: cognitive (e.g., I regularly assess the progress of my study plans.), emotional (e.g., I find the professional learning process to be engaging and enjoyable.), and behavioral engagement (e.g., I frequently take the initiative to ask questions during lectures.). Responses are scored on a 5-point Likert scale. Elevated aggregate scores reflect a more profound degree of academic engagement. Regarding internal consistency, the current sample yielded a Cronbach's α of 0.980.

ICTC scale

The 7-item ICTC Scale, developed by the CPTDSP (Li et al., 2024), is scored on a 5-point Likert scale. Featuring statements such as "Teaching is currently my top career choice." Elevated scores on this instrument signify a stronger ICTC. The instrument demonstrated excellent reliability in this study, with a Cronbach's α of 0.908.

Procedure

The CPTDSP's initial data acquisition received authorization from the Ethics Review Committee at Northeast Normal University (ERC-NENU). This secondary analysis utilized a fully anonymized dataset from the CPTDSP. Since no new data collection was conducted and all personally identifiable information had been removed, the ERC-NENU granted an exemption from further ethical review and waived the requirement for renewed consent.

Data analysis

SPSS 26.0 was utilized for preliminary data cleaning, while subsequent statistical analyses were executed through Amos 24.0 and the PROCESS macro (Hayes, 2013). The conceptual model defined career calling as the antecedent, ICTC as the mediator, and academic engagement as the outcome, with gender serving as the moderator. Furthermore, grade and place of origin were integrated as covariates. To validate the moderated mediation effects, we applied a bootstrapping procedure involving 5000 iterations to construct 95% confidence intervals. Pre-analysis preparations included dummy coding for categorical factors and standardization for all continuous measures. Finally, the absence of multicollinearity was confirmed as all variance inflation factors (VIF) remained under the threshold of 5.

Common method bias test

To detect potential common method variance, we employed Harman's single-factor technique. Following Zhou and Long's (2004) recommendation, a confirmatory factor analysis was conducted by constraining all measurement items to a single common factor. The results revealed poor model fit indices: $\chi^2/df = 188.587$, CFI = 0.791, GFI = 0.502, TLI = 0.782, RMSEA = 0.096, SRMR = 0.066, which collectively suggest the absence of severe common method bias.

Results

Descriptive statistics and correlation analysis

Correlation results indicated positive associations among gender, career calling, ICTC, and academic engagement across all pairs (see Table 1).

Career calling effects on academic engagement

The PROCESS macro (Model 4) results indicated that, with grade and place of origin held constant, career calling significantly predicted academic engagement prior to the inclusion of ICTC ($\beta = 0.81$, SE = 0.00, $p < 0.001$). Therefore, H1 is supported.

Table 1. Descriptive statistics and correlations of variables

	<i>M</i>	<i>SD</i>	1	2	3
1 Gender	1.74	0.44	—		
2 Career calling	43.98	6.56	−0.06***	—	
3 ICTC	28.54	4.03	−0.06***	0.88***	—
4 Academic engagement	114.03	17.76	−0.06***	0.80***	0.77***

Note. *** $p < 0.001$.

Table 2. Results of mediation analysis

Regression equation		Overall fit index			Regression coefficients		
Outcome variable	Predictor variable	<i>R</i>	<i>R</i> ²	<i>F</i>	β	<i>SE</i>	<i>t</i>
Academic engagement	Career calling	0.81	0.66	5536.69***	0.81	0.00	196.00***
	ICTC	0.88	0.77	9720.56***	0.88	0.00	259.86***
Academic engagement	Career calling	0.82	0.67	5158.98***	0.59	0.01	70.45***
	ICTC				0.25	0.01	24.92***

Note. *** $p < 0.001$. Prior to being entered into the model, all continuous variables were standardized, while categorical variables (i.e., gender, grade, and place of origin) were dummy-coded. Grade and place of origin are both four-level categorical variables and are not listed in the table. All numerical values are rounded to two decimal places; the same applies hereafter.

ICTC Mediation. When ICTC was incorporated as a mediator, the findings revealed three significant relationships: career calling significantly predicted ICTC ($\beta = 0.88$, $SE = 0.00$, $p < 0.001$), whereby the latter acted as a significant predictor for academic engagement ($\beta = 0.25$, $SE = 0.01$, $p < 0.001$). Furthermore, career calling's direct relationship to academic engagement persisted as notable ($\beta = 0.59$, $SE = 0.01$, $p < 0.001$). According to the mediation analysis, an indirect influence of 0.22 was observed (BootSE = 0.01, 95% CI = [0.20, 0.24]) via ICTC, accompanied by a direct effect of 0.59 (BootSE = 0.01, 95% CI = [0.58, 0.61]) from career calling to academic engagement (as presented in Table 2). Thus, H2 is supported.

Gender moderation. We employed Model 59 of the PROCESS macro to examine the moderated mediation framework. Analysis demonstrated that ICTC was positively and significantly influenced by career calling ($\beta = 0.94$, $SE = 0.01$, $p < 0.001$). Although gender did not exert a meaningful direct effect toward ICTC ($\beta = -0.01$, $SE = 0.01$, $p = 0.111$), its interaction with career calling demonstrated significance ($\beta = -0.04$, $SE = 0.01$, $p < 0.001$). This implies that gender serves as a negative moderator in the association linking career calling to ICTC. Specifically, as the gender variable increases by one unit, the influence exerted by career calling on ICTC drops by 0.04 units. That is to say, the predictive effect of career calling on ICTC is weaker among female pre-service teachers (coded as 1) than among their male counterparts (coded as 0). Furthermore, academic engagement was significantly and positively predicted by both career calling ($\beta = 0.66$, $SE = 0.03$, $p < 0.001$) and ICTC ($\beta = 0.23$, $SE = 0.03$, $p < 0.001$). The interaction involving gender and career calling remained significant in predicting academic engagement ($\beta = -0.04$, $SE = 0.02$, $p < 0.05$). This suggests that gender functions as a negative

moderator for the direct association from career calling to academic engagement. Specifically, a single-unit increment in gender is associated with a 0.04-unit reduction in how career calling affects academic engagement. These results show that the positive influence of career calling on academic engagement is attenuated among females relative to males. By contrast, no significant interaction was found between gender and ICTC ($\beta = 0.01$, $SE = 0.02$, $p = 0.732$), which implies that the connection between ICTC and academic engagement remains consistent across genders (see Table 3). Therefore, H3 is partially supported.

According to the simple slope analysis, career calling exerted a stronger predictive effect on ICTC for male students ($\beta = 0.90$, $SE = 0.01$, $p < 0.001$) compared to females ($\beta = 0.86$, $SE = 0.00$, $p < 0.001$; Figure 2). A parallel trend was observed concerning how career calling impacts academic engagement, which appeared more significant among males ($\beta = 0.62$, $SE = 0.02$, $p < 0.001$) than females ($\beta = 0.58$, $SE = 0.01$, $p < 0.001$; Figure 3).

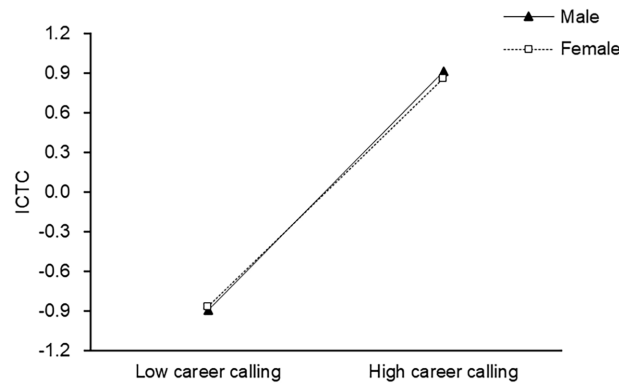
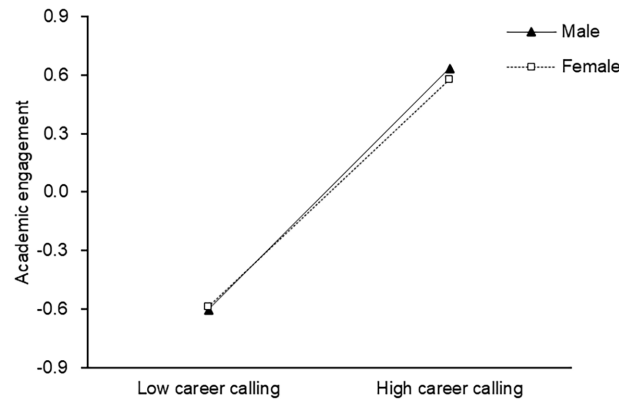
Discussion

This research found higher career calling to be associated with academic engagement, which aligns with conclusions drawn from existing research (Chen & Zhang, 2023; Shang et al., 2022). According to SCCT (Lent et al., 1994), career calling may elicit positive emotional and behavioral responses by providing individuals with intrinsic beliefs. This mechanism explains why students with heightened career calling exhibit associations with elevated initial career satisfaction and stronger career commitment (Jain & Sullivan, 2020; Wu et al., 2024). Specifically, the “summoning” nature of this construct stimulates internal drive among prospective educators, thereby increasing their readiness to devote temporal, physical, as well as psychological resources into their academic pursuits.

Table 3. Results of moderated mediation analysis

Regression equation		Overall fit index			Regression coefficients		
Outcome variable	Predictor variable	<i>R</i>	<i>R</i> ²	<i>F</i>	β	<i>SE</i>	<i>t</i>
ICTC	Career calling	0.88	0.77	7574.93***	0.94	0.01	72.67***
	Gender				−0.12	0.01	−1.60
	Gender $\times$ Career calling				−0.04	0.01	−5.28***
Academic engagement	Career calling	0.82	0.67	3756.90***	0.66	0.03	19.14***
	ICTC				0.23	0.03	6.89***
	Gender				−0.02	0.01	−2.22*
	Gender $\times$ Career calling				−0.04	0.02	−2.01*
	Gender $\times$ ICTC				0.01	0.02	0.34

Note. * $p < 0.05$, *** $p < 0.001$. Gender was dummy-coded (0 = male, 1 = female).

**Figure 2.** The moderating role of gender in the relationship between career calling and ICTC**Figure 3.** The moderating role of gender in the relationship between career calling and academic engagement

ICTC served as a mediator linking career calling to academic engagement. Drawing upon SCCT (Lent et al., 1994), career calling, as a form of learning experience, exerts its influence on performance outcomes through individuals' career goals selection. In the context of teacher candidates, the decision to enter the pedagogy profession constitutes their prospective career goal. Empirical evidence suggests that learners who exhibit greater future career focus, coupled with heightened responsibility for professional development and strong willingness toward vocational opportunities, maintain proactive attitudes when confronting academic challenges (Chen & Zhang, 2023). Prior research has identified robust correlations between career calling and career goals (Akmal et al., 2025), which facilitates positive psychological utility and

enhances academic engagement (Wen et al., 2024). Furthermore, grounded in the framework of planned behavior (Ajzen, 1991), the formation of individual behavioral decisions follows an "attitude–intention–behavior" chain. Pre-service teachers with stronger career calling develop a professional cognitive system characterized by positive affective orientations, manifested as value identification with teaching missions and internalized career commitments. Subsequently, this favorable behavioral attitude interacts synergistically with subjective norms and perceived behavioral control, effectively transforming into stable career choice intentions. Ultimately, the resultant behavioral intention activates individuals' agentic practices through goal-oriented mechanisms, specifically

evidenced by strategic investment and sustained efforts in professional learning processes.

The moderating effect of gender

Findings indicated that the link between career calling and academic engagement, as well as the initial phase of the indirect route involving ICTC, varied significantly by gender. In particular, male pre-service teachers exhibited a more robust association between their career calling and both ICTC and academic engagement than their female counterparts.

First, utilizing the theoretical lens of SCCT, the present research elucidates the formation mechanisms of gender differences in career development processes. The predictive effects of learning experiences on career goal-setting and performance outcomes demonstrate gender heterogeneity, a phenomenon that can be traced to gender-based discrepancies in perceived self-efficacy alongside outcome expectations (Lent et al., 1994). Notably, career calling—a pivotal learning experience variable—exhibits robust associations with self-efficacy (Shang et al., 2022), while male students typically manifest stronger self-efficacy compared to their female counterparts (Huang, 2013). These gender-differentiated patterns provide explanatory insights into males' comparative advantages in both academic engagement levels and ICTC.

Second, examined through the institutional environment lens, the career development of teachers in China exhibits a pronounced gender-structured characteristic, with male and female students encountering divergent social expectations and resource allocation pathways during their career progression. Although the teaching profession maintains relatively high social prestige, traditional gender role expectations lead males to predominantly perceive teaching as a career pursuit, whereas females tend to regard it as occupational selection. This cognitive divergence enables male pre-service teachers to more effectively translate career calling into concrete professional development objectives, thereby establishing a virtuous cycle of “calling–goal orientation–academic engagement.” Furthermore, in certain Western contexts, male pre-service teachers demonstrate a greater propensity for scholastic withdrawal relative to their female peers—a disparity frequently linked to divergent professional motivations and the burden of psychological stress (Kirk, 2020). In contrast, the present research indicates that the career calling functions as a more potent catalyst for the ICTC among male teacher candidates within the Chinese context. This could potentially be rooted in Chinese socio-cultural norms, where males are typically subject to higher social expectations. Once male students internalize the mission of the teaching profession, these expectations are likely transformed into a more robust and stable behavioral impetus than those observed in females.

Third, contextualized within the landscape of Chinese teacher education, the cohort of pre-service teachers exhibits a pronounced structural gender imbalance. This “skewed” gender structure functions as a contextual mechanism that shapes micro-organizational behavior. According to Kanter's (1977) tokenism theory, when a specific group represents an extremely low proportion

of an organization, it triggers three key perceptual phenomena: visibility, polarization, and assimilation. On the one hand, high visibility often translates into an invisible form of supervision, instilling in male students a sense of responsibility to represent their entire gender group, which in turn leads to higher performance pressure. On the other hand, the effects of polarization and assimilation within the teacher education environment reinforce male students' role perceptions, causing male individuals to be categorized into specific gender stereotypes. In summary, the performance pressure and gender stereotypes resulting from gender imbalance lead career calling to exert a more pronounced influence on male pre-service teachers' ICTC and academic engagement.

Fourth, regarding teacher professional development, exemplary educators need both deep subject expertise and evolving emotional support and empathic capacities. Recent empirical evidence indicates that women preparing for teaching careers exhibit considerably deeper commitment towards the execution of social and emotional education than their male peers (Choquette et al., 2024). This phenomenon reveals that female pre-service teachers possess a higher sensitivity toward the cultivation of emotional competencies, whereas male pre-service teachers may lean more toward goal-oriented tasks. These divergent orientations ultimately result in varied manifestations of academic engagement between the two groups.

Finally, gender did not exert a moderating influence on the latter segment of ICTC's mediating role. This phenomenon may be attributed to the fact that when teaching intention evolves into an explicit career commitment, its behavioral drive mechanism relies more on the principle of cognitive-behavioral consistency, and this rational decision-making process relatively diminishes the influence of gender roles.

Implications for research and practice

Theoretically, the current research broadens the scope of SCCT through its emphasis on how intrinsic drivers (e.g., career calling) and career decision-making cognitions (e.g., ICTC) function during the career preparation stage. Notably, in contrast to the Western emphasis on personal achievement, the career calling of Chinese pre-service teachers is characterized by stronger collectivist orientations and a sense of social responsibility. This distinct trait enables them not only to enhance academic engagement through resource reinvestment when facing academic stress, but also to buffer against burnout through the anticipation of their future social contributions. Furthermore, this investigation investigates gender as a moderator, thereby enriching existing literature on gender structure in teaching professions within Eastern cultural contexts.

Practically, the research evidence indicates that teacher preparation initiatives should place greater emphasis on the cognitive-affective synthesis of their educational goals. Additionally, teacher educators should adopt strategies for actively encouraging pre-service teachers' personal vocational aspirations and commitments. Specifically, professional commitment could be enhanced through career planning guidance and the influence of exemplary teacher

role models. In contrast, for female pre-service teachers, more attention should be directed toward emotional support and resilience-building measures.

Limitations

The applicability of these results to diverse pedagogical frameworks and societal backgrounds is restricted, as are their implications for different policy orientations. Unique cultural script may amplify the motivational effects of career calling among pre-service teachers.

Conclusion

Utilizing a moderated mediation framework, this research investigates the process by which career calling impacts the academic engagement among pre-service teachers. The findings reveal that career calling acts as a direct positive predictor and functions as an indirect catalyst for engagement, mediated by ICTC. Furthermore, gender moderates this process, influencing both the link between calling and ICTC (the initial segment of the mediating process) as well as its straightforward influence on academic engagement. Notably, the predictive effect of career calling is more pronounced among male pre-service teachers than their female counterparts. These findings collectively highlight the necessity to establish dynamic policy adjustment mechanisms that extend beyond individual-level trait cultivation approaches. Therefore, future research should adopt a policy evolution perspective to develop longitudinal frameworks tracking the interaction between institutional innovation and individual development.

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Availability of Data and Materials: Owing to privacy constraints, the primary datasets underlying this research are not in the public domain. To obtain these materials, authorization from the CPTDSP Project Management Committee at NENU is mandatory. Please direct any inquiries to the author for correspondence.

Ethics Approval: The NENU Ethics Review Committee (ERC) authorized the initial acquisition of CPTDSP data. Because this study involves a secondary analysis of a de-identified dataset and did not involve the handling of

sensitive personal records, it was granted an exemption from further review by the same board.

Conflicts of Interest: The authors declare no conflicts of interest.

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