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**Abstract:** In an era where globalization disrupts job markets and technological advancements rapidly change professional landscapes, engineering students face mounting uncertainties regarding their future employment. This study examines the drivers of employment aspirations in engineering undergraduates, focusing on the impact of satisfaction with university courses. Leveraging data from 3,160 engineering students, it investigates how contentment with major coursework influences their eagerness to join the workforce and identifies the conditions that modulate this relationship. The study reveals a clear link that satisfaction with major courses notably propels students' aspirations to seek employment. A gratifying curriculum directly strengthens their employment aspirations. The study further unveils that this effect is mediated by the perceived quality of educational training; high course satisfaction enhances views of overall educational excellence, which also elevates professional ambition. Moreover, active participation in the institution's career services intensifies the positive repercussions of course satisfaction on employment aspirations. Such engagement not only bolsters students' contentment with their studies but also magnifies their propensity to engage in careers pertinent to their discipline. In essence, the study underscores the pivotal influence of major course satisfaction and academic training quality in molding engineering students' career goals, while spotlighting the amplifying role of career guidance and services. These insights are instrumental for educational institutions dedicated to nurturing engineers ready to navigate the dynamic landscape of the contemporary job market.

**Key Words:** College Engineering Students; Employment Aspiration; Students' Satisfaction; Career Guidance and Services

## 1. Introduction

The congruence of university graduates' career outcomes with the effectiveness of higher education systems is a vital metric for assessing national progress and fostering sustainable economic development. Highlighting this importance, the International Labor Organization's "*World Employment and Social Outlook: Trends 2024*" report

anticipates an increase in global unemployment rates and casts light on prevailing concerns about inequality and stagnant productivity [1]. These issues are particularly acute amid the rising tide of graduates—a reflection that underscores the need to decipher the career intentions guiding job-seeking behaviors, especially for engineering students who play a pivotal role in driving technological and economic growth.

However, disconcerting trends have been observed, which is a considerable fraction of engineering graduates show a reluctance to remain in their field during job searches, risking an outflow of expertise from the sector. Influenced by self-interest, utilitarian values, and entrenched gender stereotypes, these students' career decisions point to the urgency for empirical studies that examine the synergy between university education and individual student motivations. Notably, approximately one-sixth of engineering students deviate into non-engineering professions, while nearly one-fifth waver about continuing in the engineering sector, indicating an overarching tepid intent to retain their specialization [2].

While scholars have linked this trend to the prevalence of self-centered and profit-driven considerations—often overshadowing the collective societal or national interests—and although gender stereotypes discourage many female engineering students from pursuing their trained vocation, there is a notable scarcity of research incorporating both the educational environment and engineering students' personal perspectives on their job aspirations [3], [4], [5], [6].

To address this need, this study examines the complex relationship between engineering students' satisfaction with their curriculum and their intentions to pursue a career in their field. It aims to understand how fulfilment with educational experiences influences their professional goals and to uncover any factors that may constrain their employment aspirations, seeking to offer practical recommendations for enhancing the preparedness of emerging innovators and refining the framework of engineering education programs.

## 2. Interplay between Students' Satisfaction, Career Guidance and Employment Aspiration

In the landscape of academic research, interpretations of employment aspirations are manifold and complex. These aspirations are generally recognized as the nascent and tentative desire for employment that surfaces during the process of career decision-making [7], [8]. They embody an inherent ambiguity and do not necessarily lead to definitive employment actions. Employment aspirations serve as a reflection of an individual's attitude towards a particular occupation, encompassing their hopes, ambitions, and aspirations within a career context [9]. Scholars concur that these aspirations can vary considerably based on personal motives and assessments of the professional sphere, considering various dimensions such as prospective job opportunities, preferred companies and roles, desired work locations, methods for sourcing information, as well as earning potential [10], [11]. Recognizing the multifaceted nature of these factors, this study adopts an inclusive definition of

employment aspirations that is shaped by elements like the student's educational path and area of study.

Expanding upon this conceptual framework, this study delves into the parallel notion of student satisfaction, which derives from theories of customer satisfaction [12]. Here, students are envisaged as customers who evaluate the educational services received against their expectations, leading to feelings of pleasure or dissatisfaction [13]. This comparison is particularly pertinent in higher education contexts, where students make financial investments through tuition fees intending to reap benefits from the educational services provided. Institutions of higher learning, acting as service providers, are responsible for offering comprehensive support that includes course instruction, research opportunities, mentorship, and campus governance [14], [15], [16]. It is through students' subjective appraisals of these services that their satisfaction or dissatisfaction with their educational experience is measured. Thus, understanding the dimensions of student satisfaction becomes crucial, as it directly intersects with the broader conversation about employment aspirations, influencing how future professionals perceive and navigate their entry into the workforce.

### 2.1 Major Course Satisfaction and Employment Aspiration

In the United States, the higher education framework is lauded for its personalized approach, granting students considerable leeway in terms of course selection, learning methodologies, and assessment strategies. This fosters an educational milieu replete with flexibility and openness. Meanwhile, Chinese higher education has adopted a paradigm of standardization amid its massification efforts, striving for uniformity in educational processes and the acquisition of scientific knowledge and technical competences [17]. This approach underscores the centrality of meticulously structured courses in shaping the academic and personal progression of university students in China. Within this structure, the Chinese university curriculum bifurcates into major-specific and general education courses. Major courses are intricately aligned with the student's chosen field, delivering in-depth expertise and practical skills pertinent to their future professions. For instance, subjects like Electrical and Electronic Technology, Mechanical Drawing, and Engineering Mechanics constitute the core learning repertoire for mechanical engineering students.

The import of major course satisfaction within the Chinese context cannot be overstated, particularly for engineering students whose academic achievement and career trajectories are at stake. On the academic front, high levels of satisfaction correlate with enhanced student engagement—a catalyst for profound investigation into subject matter and spirited participation in class dialogues. Such immersion not only consolidates comprehension and proficiency in course content but also manifests in superior academic outcomes, including elevated grades and course completion rates [18]. On the other hand, satisfaction influences career choice: positive experiences in major courses may foster interest in related fields, potentially guiding future academic and vocational paths. Conversely, dissatisfaction may lead students to reconsider their major or professional direction. And there were some studies confirmed that dissatisfaction with major courses was one of the essential reasons for college students

leaving the major or program [19] Additionally, satisfaction with major courses is closely linked with learning motivation, mental health, and overall well-being [20]. For example, due to the lack of physical presence and the lesser extent of informal discourse and spontaneous interaction in distance education, college students experienced decreased satisfaction with their courses, leading to barriers to understanding and communication with others and overall negative emotions [21]. Yet, to date, no research has directly established a link between the satisfaction with major courses and the employment aspirations among engineering students.

Therefore, this study posits the hypothesis 1: there is a positive influence of major course satisfaction on employment aspirations among engineering college students; that is, the greater the satisfaction with their major courses, the stronger their aspiration to seek employment in their field.

### 2.2 Training Quality: Linking Courses to Careers

Turning to the quality of student training, a critical aspect of engineering education, it has a direct impact on the quality and interest in learning. The level of instruction and guidance from educators determines the satisfaction of students within engineering programs [22]. Some institutions have overly emphasized academic degrees and titles when appointing young teachers, at the expense of practical engineering experience. This has led to a disconnect between teaching and modern engineering practices and innovation, leaving educators behind the curve of engineering development – a phenomenon that affects student satisfaction with the quality of their training [23]. Research also suggests that employment difficulties faced by college graduates are partly due to shortcomings and issues within the educational system [24]. It is evident that college students' satisfaction with major courses can affect the evaluation of the quality of training, which further influences their employment aspirations.

As such, this study proposes the hypothesis 2: the satisfaction with the quality of student training mediates the relationship between satisfaction with major courses and employment aspirations among engineering college students. In other words, the higher the students' satisfaction with the curriculum, the greater their satisfaction with the quality of training provided by their institution, which further fosters a stronger intention to secure employment post-graduation.

### 2.3 Career Guidance and Services as a Catalyst for Aspirations

In China, in the context of employment education and services, the landscape of university graduate employment services has evolved significantly from state-led job allocation policies. During the planned economy era, employment for graduates was arranged by the state. In 1987, the introduction of "supply-demand meetings" began to diminish the role of these policies. By 1999, most regions had abolished the job assignment system, and post-2000, with the expansion of higher education, employment services shifted towards promoting autonomous job selection and career guidance. Despite this transformation, university-provided career guidance and services still require enhancements in terms of service philosophy, platforms, methods, and

pathways [25]. There are deficiencies in properly guiding employment concepts, providing matching employment information, and recommending suitable positions.

Scholars have highlighted students recognize the importance of career guidance and urgently need assistance to enhance their employability, reduce the blindness of employment choices, alleviate pressure, and boost confidence [26]. University students are in a stage of career exploration where they must identify career inclinations and make targeted job selections [27], [28]. While career planning education and guidance are widely available in Chinese universities, their effectiveness is limited [29]. The absence of career education leads to graduates lacking vocational interests, self-awareness of abilities, and clarity in career goals, which results in inefficient job searches and resume submissions, thus causing slow decision-making and action during the employment process.

This leads to the hypothesis 3 of this study: Participation in career guidance and services provided by universities positively moderates the relationship between major course satisfaction and employment aspirations among engineering college students. That is, engagement in career guidance and services can strengthen the positive impact of major course satisfaction on employment aspirations.

These hypotheses reflect the crucial interplay between major course satisfaction, training quality satisfaction, and career guidance services in shaping the employment aspirations of engineering students. By exploring these relationships, this study aims to contribute to a better understanding of how to cultivate a supportive academic environment and provide effective employment services that align with the professional aspirations and needs of engineering students. Thus, this study posits the theoretical model (see Figure 1)

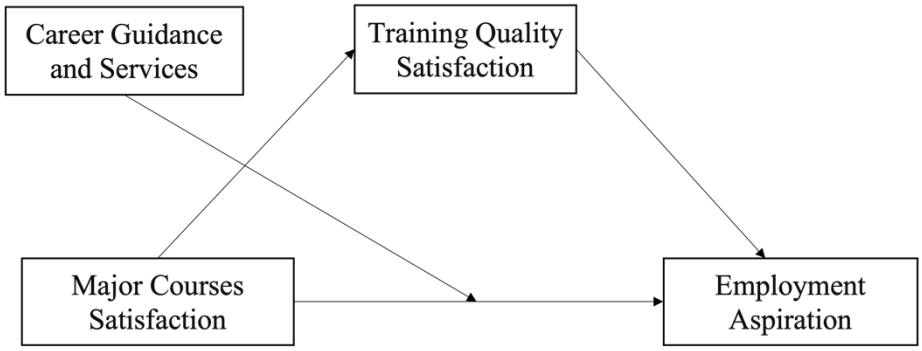


**Figure 1** Hypothetical model of the role of Training Quality Satisfaction and Career Guidance and Services in the relationship between engineering students' Major Courses Satisfaction and Their Employment Aspirations

## 3. Data Source, Methods and Variables

### 3.1 Data Source

The participant pool for this investigation was derived from responses to the "Survey on Employment and Entrepreneurship Status of Graduates from Universities in Beijing," disseminated by the Beijing Higher Education Graduates Employment Guidance Center in 2020. This survey aimed at recent graduates from institutions across

Beijing, scrutinizing their employment and entrepreneurial outcomes post-graduation. From the distribution of the survey, a substantial number of questionnaires were returned, with 11,197 being deemed valid for the study. The participants hailed from a diverse array of higher education institutions, ranging from comprehensive and specialized universities in science and engineering to those focused on agriculture and forestry, education, and medical sciences. The sample included graduates from prestigious "Double First-Class" universities as well as other standard universities. It is pertinent to note that the "Double First-Class" designation refers to a select group of Chinese universities engaged in the "Double First-Class Construction" initiative, a policy undertaken by China with the objectives of fostering world-class universities and academic disciplines attuned to contemporary global needs. By doing so, the policy seeks to enhance the quality of Chinese higher education and strengthen the country's overall competitive edge internationally. Compared to their ordinary counterparts, "Double First-Class" universities are anticipated to boast advanced educational philosophies, strong institutional frameworks, high societal reputation, and a plethora of esteemed academic disciplines. Furthermore, the range of majors represented in the sample spanned 19 distinct categories found in vocational colleges and universities, along with 12 academic fields within undergraduate and graduate programs, thus ensuring a broad and representative sampling.

This study selected exclusively undergraduate students specializing in engineering disciplines as its research subjects. The initial phase involved meticulous data sanitization and consolidation, resulting in a final cohort of 3,160 undergraduate engineering students. Among them, male students accounted for 74.1% of the total sample, a significantly higher proportion than female students (25.9%). This gender distribution aligns closely with the demographic trends observed within engineering faculties across Chinese tertiary institutions. And 78.9% were hailed in China's double-first-class universities, while the remaining 21.1% were from ordinary universities. Regarding the attending institutions, engineering students mainly came from 21 universities such as Beijing Jiaotong University (15.1%), Beijing University of Chemical Technology (12.9%), China University of Geosciences (Beijing) (7.0%), and Beijing Information Science and Technology University (6.9%). Regarding majors, the largest number of students majored in computer science and technology, accounting for 8.9% of the total sample, followed by electrical engineering and automation (4.6%), and communication engineering (4.6%). (See Table 1)

**Table 1** Demographic information of participants

| Demographic characteristic | | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 2342 | 74.1% |
| | Female | 818 | 25.9% |
| University Type | Double-first-class Universities | 2493 | 78.9% |
| | Ordinary Universities | 667 | 21.1% |

### 3.2 Methods

This study utilized a linear regression model to analyze the impact of satisfaction with major courses on employment aspiration, examining how the satisfaction level of engineering students with the setting of major courses influences the intensity of their employment aspirations. Subsequently, the Bootstrap method proposed by Preacher and Hayes (2004) was employed to test the mediating effect of satisfaction with the training quality. Specifically, using engineering students' satisfaction with major courses as the independent variable, satisfaction with the training quality as the mediating variable, and their own employment aspirations as the dependent variable, Model 4 from the PROCESS program developed by Hayes [30] was selected to test for a general mediating effect. Finally, after centralizing all continuous variables, using satisfaction with major courses as the independent variable, career guidance and services as the moderating variable, and employment aspirations as the dependent variable, Model 1 from the PROCESS program was employed to test for the moderating effect of career guidance and services.

### 3.3 Variables

The independent variable was the satisfaction level of engineering students with the setting of major courses, measured by the item "Overall, how satisfied are you with the settings of major courses in your major?" And it was rated on a 5-point scale, ranging from 1 to 5, with "1" indicating "very dissatisfied" and "5" indicating "very satisfied."

The dependent variable was the employment aspirations of engineering students, measured by the item "Are you willing to engage in work related to your major?" It was Rated on a 5-point scale, ranging from 1 to 5, with "1" indicating "very unwilling" and "5" indicating "very willing."

The mediating variable was the satisfaction level of engineering students with the training quality at their respective universities, measured by the item "How satisfied are you with the overall quality of student cultivation at your university?" It was rated on a 5-point scale, ranging from 1 to 5, with "1" indicating "very dissatisfied" and "5" indicating "very satisfied."

The moderating variable is the participation of engineering students in the career guidance and services provided by the university, measured by the item "How would you rate your participation in the following employment education and services provided by the university," where "never participated" was coded as "0" and "participated" was coded as "1."

## 4. Empirical Results Analysis

### 4.1 Study 1: The Impact of Satisfaction with Major Courses on Engineering Students' Employment Aspirations

Taking engineering students' satisfaction with major courses as the independent variable and their employment aspirations as the dependent variable, the linear regression analysis was conducted on the sample. The results (see Table 2) indicated that the Durbin-Watson statistic was 1.93, indicating minimal autocorrelation among

the observations, while the variance inflation factor (VIF) was well below 10, suggesting no severe multicollinearity issues among the variables. The regression model was highly significant ($p$<0.001), with engineering students' satisfaction with major courses accounting for 24.3% of the variance in their employment aspirations. In other words, engineering students' satisfaction with major courses ($M$=3.82, $SD$=0.79) significantly positively influenced their employment aspirations ($M$=3.80, $SD$=0.88) ($\beta$=0.50, $p$<0.001). On average, engineering students reported positive attitudes towards major courses and were likely to participate in job related to engineering. This suggested that as engineering students' satisfaction with major courses increased, so did their positive employment aspirations.

**Table 2** Standardized Regression Coefficients in Study 1

| Dependent Variable | Independent Variable | $R^2$ | $F$ | $\beta$ |
|---|---|---|---|---|
| Employment Aspirations | Major Courses | 0.243 | 1012.43*** | 0.50*** |

* $p$<0.05; ** $p$<0.01; *** $p$<0.001

Study 1 confirmed the impact of satisfaction with major courses on employment aspirations, suggesting that higher satisfaction with the major courses in their field strengthened engineering students' aspirations to seek employment. Next, Study 2 and 3, would further elucidate the mechanism through which engineering students' satisfaction with major courses affects their employment aspirations. These studies would examine the role of satisfaction with the training quality and identify under what boundary conditions satisfaction with major courses among engineering students may enhance employment aspirations.

### 4.2 Study 2: The Mediating Role of Satisfaction with Training Quality on the Relationship between Satisfaction with Major Courses and Employment Aspirations of Engineering Students

#### 4.2.1 Descriptive Statistics and Correlation Analysis

The correlation analysis of the main variables of Study 2 was performed and the results are shown in Table 3. The results showed significant positive correlations between engineering students' satisfaction with major courses and the satisfaction with training quality ($r$=0.59, $p$<0.01) as well as employment aspirations ($r$=0.49, $p$<0.01); there was also a significant positive correlation between engineering students' satisfaction with training quality and employment ($r$=0.33, $p$<0.01). The above analysis results are in line with the theoretical expectations of this study and provide preliminary support for the research hypotheses.

**Table 3** Descriptive Statistics of Variables and Correlation Coefficient Matrix in Study 2

| | $M\pm SD$ | 1 | 2 | 3 |
|---|---|---|---|---|
| Major Courses Satisfaction | 3.82±0.79 | | | |
| Training Quality Satisfaction | 4.06±0.72 | 0.59** | | |

| | | | |
|---|---|---|---|
| Employment Aspiration | 3.80±0.88 | 0.49** | 0.33** |

* $p$<0.05; ** $p$<0.01; *** $p$<0.001

### 4.2.2 Mediating Effect Test

This study used PROCESS developed by Preacher and Hayes to test the mediating effect of engineering students' satisfaction with training quality [31]. With engineering students' major courses satisfaction as the independent variable, training quality satisfaction as the mediating variable, and employment aspiration as the dependent variable, Model 4 from the PROCESS program developed by Hayes was selected to test the general mediating effect, as shown in Table 4.

**Table 4** Mediating Effect Test of Engineering Students' Training Quality Satisfaction

| Equation | Dependent Variable | Independent Variable | $R^2$ | $F$ | $\beta$ | $SE$ | 95%CI |
|---|---|---|---|---|---|---|---|
| 1 | Employment Aspiration | Major Courses Satisfaction | 0.24 | 1012.43*** | 0.55*** | 0.02 | [0.51, 0.58] |
| 2 | Training Quality Satisfaction | Major Courses Satisfaction | 0.35 | 1690.41*** | 0.54*** | 0.01 | [0.51, 0.56] |
| 3 | Employment Aspiration | Training Quality Satisfaction | 0.25 | 513.89*** | 0.08*** | 0.02 | [0.03, 0.13] |
| | | Major Courses Satisfaction | | | 0.50*** | 0.02 | [0.46, 0.55] |

* $p$<0.05; ** $p$<0.01; *** $p$<0.001

It can be observed that engineering students' satisfaction with major courses significantly predicted their employment aspirations ($\beta$=0.55, $SE$=0.02, $p$<0.001). Moreover, engineering students' satisfaction with major courses significantly predicted their satisfaction with training quality ($\beta$=0.54, $SE$=0.01, $p$<0.001). When engineering students' satisfaction with major courses and training quality were simultaneously entered into the regression equation, major courses satisfaction still significantly predicted employment aspiration ($\beta$=0.50, $SE$=0.02, $p$<0.001), and training quality satisfaction also significantly predicted classroom evaluation ($\beta$=0.08, $SE$=0.02, $p$<0.001). Therefore, the bias-corrected and accelerated bootstrap indicated that engineering students' satisfaction with training quality played a partial mediating effect between their satisfaction with major courses and employment aspirations, with the mediating effect accounting for 7.41% of the total effect (See Figure 2).

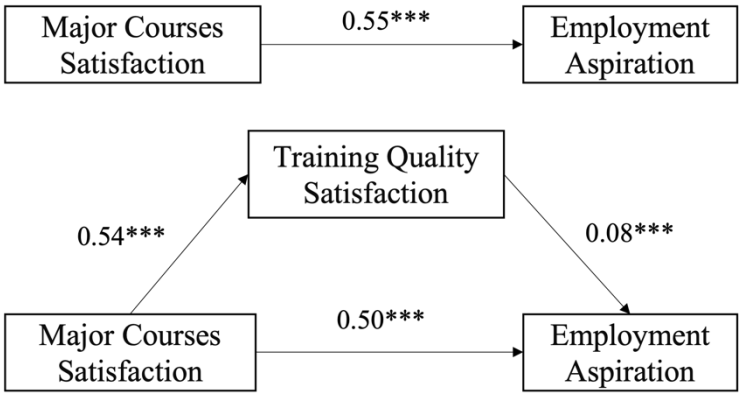


**Figure 2** Mediating Effect Model of Training Quality Satisfaction

Therefore, Study 2 confirms that for engineering students, when satisfaction with the design of major courses is higher, it translates into greater satisfaction with the training quality. This heightens satisfaction further fosters stronger employment aspirations among students. This underscores the intricate relationship between academic experiences and career aspirations, suggesting that a positive educational environment can significantly influence students' future career paths. Furthermore, this underscores the importance of holistic satisfaction in educational settings, as it not only enhances academic performance but also influences students' outlook on their professional trajectories.

### 4.3 Study 3: The Moderating Role of Career Guidance and Services on the Impact of Satisfaction with Major Courses on Engineering Students' Employment Aspirations

#### 4.3.1 Descriptive Statistics and Correlation Analysis

Descriptive statistics of the main variables in Study 3 and correlation analysis are presented in Table 5. The results indicated a significant positive correlation between engineering students' satisfaction with major courses and their employment aspirations ($r$=0.49, $p$<0.01). There was also a significant positive correlation between participation in the career guidance and services provided by the university and employment aspirations ($r$=0.08, $p$<0.01). These findings aligned with the theoretical expectations of this study, suggesting that whether engineering students engage in the career guidance and services provided by the university would influence the impact of their satisfaction with major courses on their employment aspirations.

**Table 5** Descriptive Statistics of Variables and Correlation Coefficient Matrix in Study 3

| | *M*±*SD* | 1 | 2 | 3 |
|---|---|---|---|---|
| Major Courses Satisfaction | 3.82±0.79 | | | |
| Training Quality Satisfaction | 0.85±0.35 | 0.20** | | |
| Employment Aspiration | 3.80±0.88 | 0.49** | 0.08** | |

* $p$<0.05; ** $p$<0.01; *** $p$<0.001

#### 4.3.2 Test for Moderating Effect

With engineering students' satisfaction with major courses as the independent variable, employment aspirations as the dependent variable, and the participation in career guidance and services as the moderator variable, Model 1 in the PROCESS program was adopted to test for moderating effects after all continuous variables were centralized. To provide a more intuitive reflection of the moderating effect on the engineering students' satisfaction with major course, this study employed a simple slope test [32] so that the major course satisfaction was divided into two groups, low major course satisfaction and high major course satisfaction, based on whether they fell within positive or negative one standard deviation.

The results showed that the interaction between engineering students' satisfaction with major courses and their participation in career guidance and services significantly positively influenced the employment aspiration ($\beta$=0.11, $SE$=0.04, $p$<0.05), as illustrated in Figure 3. Specifically, when not participating in the career guidance or services provided by the university, engineering students' satisfaction with major courses significantly predicted their employment aspirations in a positive direction ($\beta$=0.46, $SE$=0.04, $t$(3160)=11.64, $p$<0.001). However, when participating in the school-provided career guidance and services, the impact of satisfaction with major courses on employment aspirations strengthened. In other words, satisfaction with major courses had a more pronounced effect on engineering students' employment aspirations when they engaged in the school-provided career guidance and services ($\beta$=0.57, $SE$=0.02, $t$(3160)=29.40, $p$<0.001).

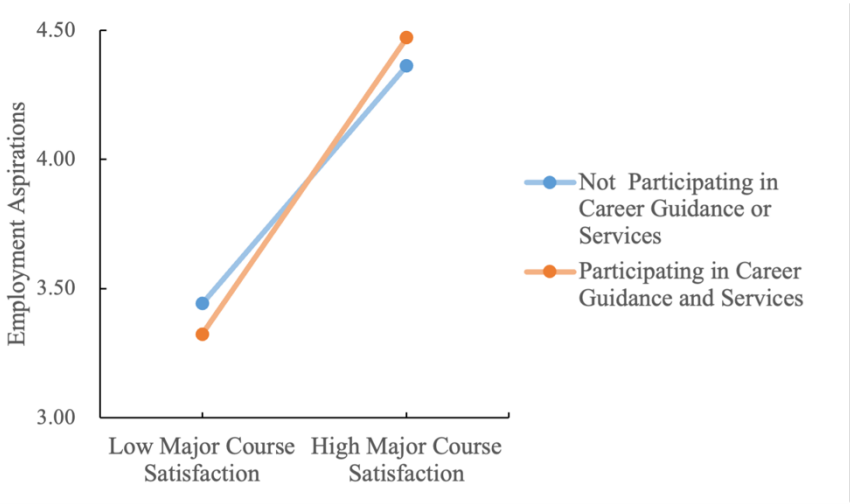


**Figure 3** Moderating Effect Model of the Career Guidance and Services

The results of Study 3 indicated that the relationship between engineering students' satisfaction with major courses and their employment aspirations was influenced by whether they participated in the career guidance and services provided by the university. Furthermore, career guidance and services had a positive moderating effect. Specifically, participating in career guidance and services could strengthen the impact of engineering students' satisfaction with major courses on their employment aspirations. For instance, when engineering students had high satisfaction with their major courses and had also engaged in the school-provided employment education and services, their employment aspirations were likely to increase. Conversely, when

satisfaction with major courses was low and students participated in employment aspiration, their employment aspirations might further decrease.

## 5. Discussion

The propensity of university students to seek employment is shaped by myriad factors, a phenomenon that has garnered widespread academic investigation. Despite this, there remains a paucity of research delving into the employment aspiration of engineering students from a subjective lens. Addressing this gap, the present study scrutinizes the nuanced relationship between major course curricula and engineering students' personal perceptions, endeavoring to construct a coherent framework that bolsters their drive towards gainful employment.

Central to this analysis is the affirmation of the profound influence that satisfaction with major courses exert on engineering students' employment aspirations. A noteworthy revelation is that elevated satisfaction levels are synonymous with heightened intention to enter the job market. This correlation underscores the relevance of self-perceptions—spanning cognitions, attitudes, and emotions related to course content and its delivery—as critical determinants in shaping career pathways [33], [34]. Such is the extent of this impact that, as evidenced within the 2022 graduating class in China, a significant 36% registered discontent with the curriculum, deeming it obsolete and lacking practical utility—an increase from the previous year's 33% [35]. This escalating dissatisfaction hints at an alarming trend: outdated curricula may erode students' motivation for job-seeking [36], [37]. In light of the aforementioned considerations, educational institutions are compelled to align their curricular offerings with both national strategic initiatives and regional industrial expansion, with a special emphasis on burgeoning sectors such as next-generation information technology and intelligent manufacturing. Specifically, academic programs within these dynamic fields ought to be meticulously designed to incorporate a balance of theoretical knowledge and practical experience. This entails ensuring that students assimilate foundational concepts whilst concurrently participating in hands-on activities and industry-related projects. Such immersion in practical experiences not only augments the students' comprehension of the subject matter but also facilitates the cultivation of skills imperative for their subsequent professional endeavors. Moreover, it is imperative that academic courses establish an explicit nexus with the job roles prevalent within the industry. Academic curricula should transcend the mere transmission of abstract theories, instead adapting course content to encompass the particular competencies and skills sought by industry employers. This alignment is instrumental in equipping graduates with the requisite expertise to effortlessly integrate into the workforce and make substantive contributions from the outset of their careers Additionally, educators are encouraged to diversify assessment methods and embrace more innovative and open-ended evaluation strategies beyond traditional examinations and written assignments. By providing engineering students with a broader spectrum of assessment options and creative latitude, there is potential to substantially enhance their inventive capacities, analytical acumen, logical reasoning, problem-solving prowess, and other

essential attributes. Through the strategic refinement of course structures, institutions can enable engineering students to adeptly navigate the vanguard of their respective fields, leverage technological advancements, pursue sustainable development, and consolidate their confidence in securing gainful employment [38], [39].

Building on this premise, the study further illuminates how contentment with educational training quality acts as an intermediary between major course satisfaction and employment aspiration. It suggests a pressing need for academic instruction to not only track industry evolution but also pivot away from traditional theory-laden methods that often neglect hands-on experience. The disconnect fostered by such pedagogies can stifle student contentment and suppress their engagement with the job market [40] Therefore, amidst ongoing technological and industrial transformations, universities have a mandate to nurture innovatively skilled graduates who can adaptively navigate the complexities of modern employment landscapes [41].

This study's third vector of investigation presents compelling evidence that school-provided career guidance and services effectively enhance the positive effects of major course satisfaction on employment aspiration. These initiatives serve as vital links between academia and industry, equipping students with insights into labor market demands and facilitating comprehensive career development [42]. Moreover, in an era marked by fierce competition for jobs, the provision of holistic support by educational institutions becomes indispensable. Students, for their part, must seize these opportunities to refine their employability and navigate the path to professional success.

Practical implications gleaned from the findings signal concerns regarding the efficacy of current approaches to talent development and employment support. For instance, a lack of satisfaction with major courses among engineering students could undermine the benefits of even robust employment services, suggesting that such services might overlook key elements like course relevancy and practical application. This disconnect has the potential to weaken the impact of employment education and compromise both talent cultivation and students' decisive steps towards employment. Universities, therefore, face the imperative to revamp their curricular structures, delivering an education that is both substantive and systemized and making university programs to become more relevant to the real workplace, thereby ensuring that students are well-prepared to transition seamlessly into the workforce [43], [44], [45].

## 6. Conclusion

In the face of a dynamic global employment landscape, it is imperative for engineering education to evolve in order to maintain its pertinence. This study investigates he determinants that bolster employment aspirations among engineering undergraduates, against a backdrop of swift technological advancement and industrial evolution. Our analysis delineates the significant impact of contentment with major coursework on students' proclivity to initiate job-hunting endeavors, unraveling pivotal mediators and moderators within this nexus.

The crux of our findings demonstrates that satisfaction derived from major-specific courses amplifies engineering students' zeal to enter the job market and solidifies their professional ambition. Further dissection of the data indicates that the perceived caliber of educational training offered by higher institutions serves as an intermediary force; heightened satisfaction with the quality of instructional resources enhances overall contentment, which subsequently fortifies career aspirations. Moreover, engagement with university-provided career guidance and services not merely complements but intensifies the effect of course satisfaction upon these vocational intentions. Such involvement acts as a potent accelerant, crystalizing the resolve to embark on a professional trajectory.

The insights gleaned suggest a clear route for academic establishments to cultivate a more profound connection with employment objectives. There is a pressing need to fine-tune engineering curricula to synergize scholarly thoroughness with industry applicability, thereby kindling interest in professional endeavors. It is essential that educational frameworks strike a balance between theoretical constructs and practical expertise to satiate student appetite for knowledge and equip them with skills that are in demand in the marketplace. Harmonizing academic content with its real-world utility fosters satisfaction, steering students toward successful employment outcomes.

The critical importance of contentment with the caliber of educational offerings mandates that academic institutions maintain exemplary standards in teaching and service provision. It is imperative that curricula are not only steeped in practical application and innovation but also customized to foster adeptness in technical domains and enhance analytical thinking skills [46]. Such well-rounded educational experiences elevate learner satisfaction and propel students toward their professional aspirations. Additionally, robust career education and support services are absolutely vital—these provisions do not merely nurture career ambitions but also furnish learners with the necessary tools to achieve them.

While this investigation delineates these interrelations, it acknowledges its own scope limitations; it does not distinguish between nascent "New Engineering" disciplines and the traditional domains—a notable gap considering their divergent trajectories and potential variances in career outlooks [47], [48]. Future studies should endeavor to provide a more detailed perspective by juxtaposing job intentions within these distinct sectors, thereby shedding light on subtle trends and contributing to targeted pedagogical advancements.

Within the wider spectrum of STEM education, there is an escalating awareness of its pivotal role in forging a comprehensive methodology for developing scientific acumen and fostering innovative aptitudes. Prospective research might evaluate how cross-disciplinary abilities are inculcated within engineering programs and the impact thereof on learners' versatility and their triumph in multifaceted settings. These revelations could refine our grasp of employment intentions and catalyze more efficacious educational methodologies.

Finally, the present study broaches the topic of an existing skew in engineering education, which favors specialized knowledge at the expense of a broader humanistic comprehension. The amalgamation of humanistic principles is indispensable for

graduates to effectively engage with and contribute to a society predominantly shaped by technology. Subsequent inquiries should probe the effect of humanistic literacy on career aspirations, investigating its interplay with employability, and proposing avenues for its integration within engineering instruction. By achieving this, we can equip engineering students to not just succeed in their professional pursuits but also to make thoughtful contributions to the societal tapestry.

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