



Craftmanship Spirit, Professional Values, and Learning Motivation among Chinese Higher Vocational College Students

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Abstract

The interplay among craftsmanship spirit, professional values, and learning motivation in higher vocational education remains underexplored, particularly how these constructs jointly shape students' motivational structures during the transition to professional roles. This study examined the relationships among these three constructs in Chinese higher vocational college students. A descriptive survey design was employed with 555 graduating students (aged 19–23) recruited via stratified random sampling from two higher vocational colleges in Chongqing, China. Participants completed the Craftmanship Spirit Scale, the Professional Values Scale, and the Learning Motivation Scale, alongside demographic questions. Data were analyzed using descriptive statistics, non-parametric group comparisons, Spearman correlations, multiple regression, and bootstrap mediation. Results indicated that craftsmanship spirit, professional values, and learning motivation were above average. Age, school type, internship experience, academic level, and parental education were consistently associated with all three constructs; sex differences were small for craftsmanship spirit and learning motivation but were more pronounced across specific professional value dimensions, and major differentiated selected outcomes. Significant positive correlations emerged among all constructs, with craftsmanship spirit most strongly associated with endogenous learning motivation ($\rho = .746$). Regression analyses indicated that specific value sub-dimensions—particularly personal development, intellectual stimulation, and network resources—positively predicted both endogenous and exogenous motivation. When aggregate value scores were entered alongside their sub-dimensions, the total internal and external professional value coefficients became negative, consistent with statistical suppression and construct heterogeneity. Mediation analysis showed that internal professional values partially mediated the craftsmanship–motivation relationship, whereas external professional values exhibited a negative indirect effect. These findings suggest that differentiated cultivation of professional value dimensions, rather than generalized value messaging, may more effectively support vocational students' learning motivation and craftsmanship development.

Keywords: *craftmanship spirit; professional values; learning motivation; vocational education; higher vocational students; China; mediation analysis*

1. Introduction

The transformation of technical and vocational education has become a global priority as economies shift toward knowledge-based and skill-intensive production systems. Within this context, three psychological constructs have emerged as critical to student development: craftsmanship spirit, professional values, and learning motivation. Recent research has established the individual importance of these constructs in shaping vocational students' career readiness and skill acquisition (Deng Hongbao & Liu Ce, 2023; Huang Xi, 2025). Craftmanship spirit enhances skill mastery and professional commitment (Guo Da & Zhang Ying, 2025), professional values shape career decision-making and employment adaptability (Yu Shijia, 2025), and learning motivation drives academic persistence and engagement (Li He, 2025). Yet significant gaps remain in understanding their synergistic effects within vocational education

contexts, particularly how value orientations and professional spirit jointly shape students' motivational structures during the critical transition from student to professional roles (Brown & Davis, 2022; Park et al., 2022).

In China, these constructs have gained particular urgency following the National Vocational Education Reform Implementation Plan (2020–2023), which emphasizes cultivating students' craftsmanship spirit and professional qualities (Ministry of Education, 2021). However, empirical research indicates considerable inter-school variability in implementation outcomes (Tan Guangxing, 2023). Recent surveys reveal that higher vocational students frequently exhibit insufficient professional identity and declining motivation for skills learning (Li Bing & Yang Ting, 2021; Yao Xu, 2025). Notably, the "material pursuit" dimension of learning motivation scores highest among vocational students, suggesting a pronounced material orientation, while knowledge-seeking and

achievement motivation require strengthening (Huang Xi, 2025). Concurrently, enterprise feedback indicates that fresh graduates demonstrate room for improvement in professional ethics and the pursuit of excellence (China Vocational Education Development Report, 2024). These challenges are particularly pressing under the "Made in China 2025" strategy (Ministry of Industry and Information Technology, 2021), which demands highly skilled technical talent with internalized professional values and sustained learning commitment.

Craftsmanship spirit in the Chinese vocational context refers to a comprehensive set of values and behavioral tendencies including striving for excellence, dedication, responsibility, continuous growth, and maintaining professional reputation (Lin Chen et al., 2025; Yin Chenxi & Guo Da, 2025). It encompasses not only technical proficiency but also the attitudinal and ethical dimensions of professional practice (Tan Guangxing, 2023; Yang Shiyuan & Shi Lianhai, 2025). Professional values—particularly the distinction between internal orientations (intellectual stimulation, autonomy, personal growth) and external orientations (economic returns, job security, social recognition)—similarly influence how students engage with learning and anticipate their professional futures (Zeng Meihong & Fan Weiqiao, 2024; Zhang Chunye, 2022). Learning motivation among vocational students exhibits a characteristic structure of "dominant extrinsic motivation with insufficient but present intrinsic motivation" (Huang Xi, 2025), shaped by both intrinsic interest in skill challenges and dependence on external evaluation.

Despite theoretical recognition that these constructs interact, few studies have empirically examined their combined influence or the pathways through which they shape each other. The present study addresses this gap by investigating the interplay among craftsmanship spirit, professional values, and learning motivation in Chinese higher vocational college students. Specifically, this study sought to: (1) describe the demographic characteristics of the respondents; (2) assess their levels of craftsmanship spirit, professional values, and learning motivation; (3) examine differences in these constructs when grouped by respondent profiles; (4) investigate the correlations among the three constructs; (5) test the mediating role of professional values in the relationship between craftsmanship spirit and learning motivation; and (6) propose a psychological intervention program based on the findings.

2. Review of Related Literature

2.1 Craftsmanship Spirit: Conceptualization and Structure

Craftsmanship spirit is conceptualized as an internalized professional belief system and behavioral disposition that develops through sustained engagement in skilled practice. Within the Chinese vocational education context, it encompasses a comprehensive set of values and tendencies including striving for excellence, dedication, responsibility, continuous growth, and maintenance of professional reputation (Lin Chen et al., 2025; Yin Chenxi & Guo Da, 2025). For higher vocational students, craftsmanship spirit represents a foundational professional quality that integrates technical proficiency with attitudinal commitment and ethical orientation toward work (Tan Guangxing, 2023; Yang Shiyuan & Shi Lianhai, 2025).

Zhao Chen, Fu Yue, and Gao Zhonghua (2020) systematically analyzed media discourse on craftsmanship and validated a five-dimensional structure through large-sample psychometric testing. These dimensions include: personal growth (emphasis on continuous learning and skill development), responsibility and commitment (accountability for work outcomes), striving for excellence (high standards for quality and detail), cherishing reputation (valuing professional dignity and work recognition), and perseverance and determination (sustained effort despite difficulties). This multidimensional model has demonstrated good reliability and structural validity among vocational student populations (Yang Shiyuan & Shi Lianhai, 2025; Hong Songlin, 2025).

Research has identified multiple factors influencing craftsmanship development. At the individual level, growth mindset, self-efficacy, achievement motivation, and learning strategies significantly predict craftsmanship levels (Liu Huijuan, Zhu Fengyun & Zheng Yanfang, 2025; Yang Yani, 2023). Demographic characteristics—including academic performance, major type, and parental educational background—also show systematic associations with craftsmanship dimensions (Wu Jing, 2023; Chen Minyu et al., 2022; Guo Da & Zhang Ying, 2025).

The development of craftsmanship spirit through practical training environments and mentor relationships, as documented in Chinese vocational contexts (Dong Yang, 2025; Sun Si, 2025), aligns with broader observations that skill-based learning

ecosystems require sustained engagement and feedback structures. Rao et al. (2025), examining AI-enabled learning environments, similarly noted that perceived effectiveness of educational tools depends on implementation quality and pedagogical integration—a finding that parallels the importance of structured apprenticeship models in craftsmanship cultivation.

The demonstration effect of skilled mentors, identified as crucial for shaping students' professional commitment (Yang Shiyuan & Shi Lianhai, 2025), finds indirect support in research on educational technology adoption, where teacher support and modeled practices significantly influence student engagement (Rao et al., 2025). These convergent observations suggest that craftsmanship development, whether in traditional vocational settings or digitally mediated learning environments, depends on sustained, high-quality interpersonal engagement and structured feedback mechanisms. For vocational students, craftsmanship spirit is associated with enhanced skill acquisition, professional identity, learning engagement, and subsequent employment competitiveness (Jiang Lifeng, 2025; Cen Ning, 2023).

2.2 Professional Values: Internal and External Orientations

Professional values are relatively stable judgment systems individuals form regarding the significance, rewards, social functions, and self-actualization possibilities of occupations (Shao Ran et al., 2025; Zhang Chunye, 2022). They reflect not only preferences for “what kind of occupation to pursue” but also deeper orientations toward “how” and “why” to engage in professional activity (Li Bing & Yang Ting, 2021). In vocational education research, professional values encompass both individual career development needs and recognition of broader social responsibilities, exhibiting phase-specific and practice-grounded characteristics (Shao Ran et al., 2025).

Contemporary scholarship distinguishes between internal and external orientations. Internal values emphasize psychological satisfaction and meaningful experience derived from professional activities—intellectual stimulation, autonomy, creativity, achievement, and altruism (Zeng Meihong & Fan Weiqiao, 2024; Zhang Chunye, 2022). External values orient toward occupational conditions and returns—economic income, job security, lifestyle compatibility, social reputation, and interpersonal relationships (Niu Yafei, 2024; Xu Mingzhi, 2023).

This differentiation resonates with educational technology findings. Rao et al. (2025) reported that digital learning tools were perceived as effective for engagement and content relevance, yet their impact

on academic performance was rated more cautiously—suggesting that instrumental value perceptions (external orientation) may not automatically translate into deeper learning outcomes. This parallels vocational students' distinction between internal orientations (intellectual stimulation, autonomy, personal growth) and external orientations (economic returns, job security) (Zeng Meihong & Fan Weiqiao, 2024). Users' recognition of systemic barriers such as access inequities, cost, and algorithmic bias—even when reporting low personal friction (Rao et al., 2025)—further supports the view that value structures are shaped by contextual factors beyond immediate experience, consistent with the role of family cultural capital and institutional environments (Guo Da & Zhang Ying, 2025).

Cross-cultural research similarly suggests that value structures are shaped by socio-economic context rather than representing simple dichotomies (Adams et al., 2022; Markus & Kitayama, 2023). Zeng Meihong and Fan Weiqiao (2024), through systematic scale development with Generation Z Chinese college students, confirmed a two-factor structure comprising 17 specific dimensions, with internal and external factors showing differential relationships to academic engagement and career adaptability.

Professional values formation is influenced by interactions among individual characteristics, family background, and educational experience. Gender, age, major, and academic achievement show systematic associations with value orientations (Li Bing & Yang Ting, 2021; Niu Yafei, 2024). Family cultural capital, operationalized through parental education, significantly shapes whether students emphasize internal growth values or external security concerns (Guo Da & Zhang Ying, 2025). Educational factors—curriculum design, internship quality, and institutional type—also influence value development, with sustained enterprise-based experience promoting shifts from instrumental toward developmental orientations (Tan Guangxing, 2023). Internal professional values have been positively associated with both learning engagement (Zhang Chunye, 2022) and craftsmanship spirit (Xu Mingzhi, 2023) among vocational students.

2.3 Learning Motivation: Endogenous and Exogenous Dimensions

Learning motivation constitutes the internal psychological dynamic system that initiates, directs, and sustains learning behavior (Huang Xi, 2025). In educational psychology, it is understood as a mediating mechanism linking cognition, emotion, and behavior, thereby influencing engagement, strategy selection, achievement, and long-term development (Xie Tian & Zhou Jue, 2019).

Contemporary research emphasizes its dynamic, situated, and developmental nature, recognizing motivation as continuously constructed through person–environment interaction.

The distinction between endogenous (intrinsic) and exogenous (extrinsic) motivation remains foundational. Endogenous motivation arises from interest, challenge, and competence enhancement inherent in learning activities, while exogenous motivation depends on external rewards, evaluations, social expectations, or situational pressures (Chi Liping & Xin Ziqiang, 2006; Huang Xi, 2025). Chi and Xin (2006), adapting Amabile et al.'s Work Preference Inventory for Chinese college students, further refined this structure: endogenous motivation comprises challenge and enthusiasm, whereas exogenous motivation encompasses dependence on others' evaluations, preference for simple tasks, focus on interpersonal competition, and pursuit of rewards.

The characterization of vocational students' motivational structure as “dominant extrinsic motivation with insufficient but present intrinsic motivation” (Huang Xi, 2025) finds a parallel in financial literacy research. Espelita et al. (2025), examining monetary policy awareness among Filipino students, found awareness positively associated with saving and investing behaviors (longer-horizon outcomes) but not with spending behavior (short-horizon). This echoes the distinction between endogenous motivation (sustained, internally driven engagement) and exogenous motivation (externally cued, shorter-term responses). Their regression models, showing awareness and perceptions jointly predicted saving ($R^2 = .22$) and investing ($R^2 = .15$) but not spending, highlight that knowledge-attitude-behavior pathways are domain-specific—an insight relevant to cultivating different types of learning motivation.

Within vocational education, motivation exhibits distinctive characteristics. Specialized, skill-oriented content ties intrinsic motivation closely to task challenge, practical feedback, and skill advancement (Huang Xi, 2025; Yang Yani, 2023). At the same time, external factors—employment pressure, internship evaluation, teacher feedback, and social expectations—substantially shape learning behavior. Huang Xi (2025) emphasized vocational students' reliance on external evaluation for sustained investment, even as they show interest in skill challenges. Motivation has been systematically linked to professional identity (Yin Yufei, 2021), self-management (Liu Huijuan et al., 2025), and achievement motivation

(Yang Yani, 2023). For graduating vocational students, it reflects not only immediate drivers of learning but also psychological expectations and value judgments regarding future career development.

2.4 The Interplay Among Constructs: Empirical Evidence

Although craftsmanship spirit, professional values, and learning motivation have each received substantial research attention, empirical investigation of their interrelationships remains limited. Existing evidence suggests meaningful associations. Yang Yani (2023) found that achievement motivation and challenge orientation serve as psychological links connecting learning motivation to craftsmanship spirit, facilitating the transformation of short-term tasks into long-term skill accumulation. Xie Tian and Zhou Jue (2019) similarly emphasized that internalization of learning motivation underpins sustained commitment to quality-oriented work.

Research on professional values indicates associations with both learning and craftsmanship outcomes. Zhang Chunye (2022) demonstrated that internal career values significantly predict college students' learning engagement, while Xu Mingzhi (2023) extended this to vocational students, reporting positive correlations between internal values and craftsmanship spirit. Yin Yufei (2021) identified professional identity as an indirect pathway through which learning motivation influences engagement, mediated by identity strength. Liu Huijuan et al. (2025) further documented learning motivation's mediating role between professional identity and self-management.

The proposition that professional identity mediates the link between learning motivation and engagement (Yin Yufei, 2021) parallels framework-building work in healthcare analytics. Atento et al. (2025) argued that organizational alignment moderates the relationship between analytics capability and decision quality, noting that technically strong programs may fail when stakeholder priorities are misaligned. Transposed to vocational education, this suggests that translating craftsmanship spirit into learning motivation via professional values depends on alignment between students' orientations and institutional messages—a hypothesis consistent with findings that internal values positively mediated the craftsmanship–motivation relationship, while external values acted as suppressors. The moderation logic advanced by Atento et al. (2025) thus provides a theoretical

vocabulary for understanding why value transmission is contingent on alignment rather than automatic.

The finding that specific professional value sub-dimensions (personal development, intellectual stimulation, network resources) positively predicted motivation, while global value scores showed negative associations under statistical control (present study, Section 4.5), resonates with methodological insights from consumer behavior research. Atento and Espelita (2025), analyzing feeder-school Facebook discourse, demonstrated that qualitative social-media analysis can uncover latent values overlooked by generic survey items. Their Consumer-Centered Marketing Framework (CCMF) argues that effective positioning depends on institutions' capacity to "echo, respect, and extend" community values rather than rely on generic claims. Applied to vocational education, this suggests cultivating motivation requires responsiveness to students' specific value configurations rather than broad "professional values" messaging. The five domains identified in that study (community belonging, creativity, academic excellence, leadership, integrity) offer a heuristic for understanding vocational students' multidimensional and context-sensitive value structures.

Despite these insights, most studies have examined pairwise relationships in isolation. The synergistic effects of all three constructs—particularly how professional values and craftsmanship spirit jointly shape motivational structures among vocational students approaching graduation—remain underexplored (Brown & Davis, 2022; Park et al., 2022). Moreover, the distinction between internal and external value orientations and their potentially differential relationships to endogenous and exogenous motivation types has yet to be systematically investigated within an integrated framework.

2.5 Synthesis and Gaps

The literature establishes craftsmanship spirit, professional values, and learning motivation as individually significant psychological constructs in vocational education. Craftsmanship spirit encompasses multidimensional professional commitment linked to skill mastery and career adaptability. Professional values differentiate into internal orientations toward meaningful work and external orientations toward occupational rewards, shaped by individual, family, and educational factors. Learning motivation comprises endogenous and exogenous dimensions with distinctive patterns among vocational students. Preliminary evidence suggests associations among these constructs, with

professional identity and achievement motivation potentially serving as bridging mechanisms.

However, four significant gaps remain. First, the synergistic effects of craftsmanship spirit and professional values on learning motivation have not been empirically tested within an integrated model. Second, the potentially differential roles of internal versus external professional values in shaping endogenous versus exogenous motivation types remain unexamined. Third, graduating vocational students—a population undergoing critical transition from student to professional roles—have received limited research attention. Fourth, mediation pathways through which craftsmanship spirit influences motivation via value orientations have not been systematically investigated. The present study addresses these gaps by examining the interplay among all three constructs in a sample of Chinese higher vocational college students approaching graduation.

3. Methodology

3.1 Research Design

This study employed a descriptive survey design with quantitative data collection. This approach was selected to systematically assess the distribution of craftsmanship spirit, professional values, and learning motivation among the target population and to examine relationships among these variables through statistical analysis.

3.2 Setting and Participants

The study was conducted in two higher vocational colleges in Chongqing, China. Participants were graduating students aged 19 to 23 years. From a total population of approximately 5,000 students, a stratified random sampling method was used to select participants across major professional categories including automotive engineering, electronic information, and preschool education. Based on sample size estimation within a 95% confidence level and $\pm 5\%$ margin of error (minimum required $n = 384$), and accounting for anticipated invalid responses (approximately 20%), 555 valid questionnaires were collected and included in the final analysis.

The sample comprised 324 males (58.4%) and 231 females (41.6%). Age distribution was concentrated at 20–22 years (93.7%), with 21 years representing the largest group (51.0%). Participants were drawn from public (56.9%) and private (43.1%) institutions, representing engineering (36.8%), liberal arts (34.8%), science (15.1%), and art (13.3%) majors. Regarding internship experience, 32.6% had no internship, 30.3% had 1–

6 months, 14.1% had 7–12 months, and 23.1% had more than 12 months. Academic learning level was distributed as subaverage (12.4%), average (43.1%), above-average (27.4%), and uncertain (17.3%). Parental educational background was predominantly junior high school or below (50.5%) and senior high school (24.7%), with junior college (20.0%), undergraduate (4.7%), and postgraduate (0.2%) comprising the remainder.

3.3 Measures

General Information Questionnaire. A self-developed questionnaire collected demographic data including sex, age, major, learning level, school type, internship experience, and parental educational background.

Craftsmanship Spirit Scale. Craftsmanship spirit was measured using the 20-item scale developed by Zhao Chen, Fu Yue, and Gao Zhonghua (2020). The scale assesses five dimensions: personal growth (items 1–4), responsibility and commitment (items 5–8), striving for excellence (items 9–12), cherishing reputation (items 13–16), and perseverance and determination (items 17–20). Items are rated on a 5-point Likert scale (1 = very inconsistent to 5 = very consistent). The scale has demonstrated good reliability (Cronbach's α for dimensions and total scale all exceeding .80) and structural validity (CFI = 0.97, RMSEA = 0.05) in Chinese vocational student samples. Higher scores indicate stronger craftsmanship spirit.

Professional Values Scale. Professional values were assessed using the 51-item "Z-Generation College Students' Professional Values Scale" developed by Zeng Meihong and Fan Weiqiao (2024). Based on Super's career values framework, the scale comprises two higher-order factors: internal professional values (18 items across six dimensions: diversity, autonomy, intellectual stimulation, achievement, creativity, altruism) and external professional values (33 items across 11 dimensions: economic returns, lifestyle, safety, personal development, family maintenance, network resources, colleague relationships, working environment, fair competition, reputation, supervisory relationships). Items are rated on a 5-point Likert scale (1 = not important at all to 5 = extremely important). The scale demonstrates strong reliability (total scale α = .960; internal factor α = .919; external factor α = .952) and structural validity (χ^2/df = 4.961, CFI = 0.954, RMSEA = 0.076). Higher scores indicate stronger professional value orientations.

Learning Motivation Scale. Learning motivation was measured using the Chinese version of the Working Preference Inventory (WPI), adapted by Chi Liping and Xin Ziqiang (2006). The 30-item scale assesses endogenous motivation (challenge and enthusiasm dimensions) and exogenous motivation (dependence on others' evaluations, selection of simple tasks, focus on interpersonal competition, and pursuit of rewards dimensions). Items are rated on a 4-point Likert scale (1 = very inconsistent to 4 = very consistent). The scale has demonstrated acceptable reliability in Chinese college student samples (total scale α = .75; endogenous α = .78; exogenous α = .80; four-week test-retest reliability = .83–.88). Higher scores indicate stronger learning motivation.

3.4 Data Collection and Analysis

Following institutional ethics approval, data were collected through offline paper questionnaires. The questionnaire packet included an informed consent form, general information questionnaire, and the three standardized scales. Participants were informed of the study purpose, assured of confidentiality and anonymity, and reminded of their right to withdraw at any time. Attention-check items were embedded to ensure response validity. Data collection was completed during regular class sessions under researcher supervision. Completed questionnaires were checked for completeness; responses with excessive missing data or incorrect attention-check answers were excluded.

Data were analyzed using SPSS software. Descriptive statistics (frequencies, percentages, means, standard deviations) were computed for demographic characteristics and scale scores. Due to non-normal distributions identified in preliminary screening, group differences in craftsmanship spirit, professional values, and learning motivation across demographic variables were examined using Mann-Whitney U tests (for two-group comparisons) and Kruskal-Wallis H tests (for comparisons involving three or more groups). Spearman rank correlation coefficients were calculated to assess relationships among the three constructs. Multiple regression analyses were conducted to examine the predictive effects of craftsmanship spirit dimensions and professional value dimensions on endogenous and exogenous learning motivation. Bootstrap mediation analysis (5,000 resamples) with 95% confidence intervals was used to test the mediating role of internal and external professional values in the relationship between craftsmanship spirit and learning motivation.

3.5 Ethical Considerations

The study protocol was reviewed and approved by the Ethics Committee of Lyceum of the Philippines University-Batangas. All participants provided informed consent prior to participation. Questionnaires were completed anonymously, and all data were stored in password-protected files accessible only to the research team to ensure confidentiality. Participants were informed they could withdraw at any time without consequence.

4. Results and Discussion

4.1 Demographic Characteristics of Respondents

The sample comprised 555 graduating higher vocational college students. Males represented 58.4% ($n = 324$) and females 41.6% ($n = 231$). Age distribution was concentrated at 20–22 years (93.7%), with 21 years as the modal category (51.0%). Participants were drawn from public (56.9%) and private (43.1%) institutions, representing engineering (36.8%), liberal arts (34.8%), science (15.1%), and art (13.3%) majors. Regarding internship experience, 32.6% had no internship, 30.3% had 1–6 months, 14.1% had 7–12 months, and 23.1% had more than 12 months. Academic learning level was distributed as subaverage (12.4%), average (43.1%), above-average (27.4%), and uncertain (17.3%). Parental educational background was predominantly junior high school or below (50.5%) and senior high school (24.7%), with tertiary education comprising the remainder (junior college 20.0%, undergraduate 4.7%, postgraduate 0.2%).

4.2 Levels of Craftsmanship Spirit, Professional Values, and Learning Motivation

Craftsmanship Spirit. The overall craftsmanship spirit mean score was 82.66 ($SD = 15.78$), indicating an above-average level. Among the five dimensions, "Responsibility and Commitment" scored highest ($M = 17.09$, $SD = 3.37$), followed by "Personal Growth" ($M = 16.88$, $SD = 3.46$), "Striving for Excellence" ($M = 16.70$, $SD = 3.46$), "Cherishing Reputation" ($M = 16.08$, $SD = 3.49$), and "Perseverance and Determination" ($M = 15.90$, $SD = 3.44$). The difference between highest and lowest dimensions was approximately 1.19 points, suggesting relatively stable responsibility orientation alongside less developed persistence in long-term skill training.

Professional Values. Internal professional values ($M = 127.12$, $SD = 38.74$) scored higher than external professional values ($M = 116.85$, $SD = 42.26$), indicating stronger orientation toward intrinsic career aspects. Within internal values, "Intellectual Stimulation" ranked highest ($M = 12.39$, $SD = 2.57$), followed by "Autonomy" ($M =$

10.57, $SD = 4.35$), "Altruism" ($M = 10.49$, $SD = 4.35$), and "Creativity" ($M = 10.25$, $SD = 4.21$). Within external values, "Personal Development" ranked highest ($M = 11.96$, $SD = 2.86$), followed by "Fair Competition" ($M = 11.06$, $SD = 3.51$) and "Network Resources" ($M = 10.70$, $SD = 4.22$). "Economic Returns" ($M = 10.32$, $SD = 4.24$) ranked ninth among external dimensions, suggesting material considerations are not predominant in students' value structures.

Learning Motivation. Exogenous motivation ($M = 51.31$, $SD = 9.38$) scored higher than endogenous motivation ($M = 45.58$, $SD = 8.07$), indicating greater dependence on external drivers. Within endogenous motivation, "Challenge" ($M = 26.02$, $SD = 4.81$) exceeded "Enthusiasm" ($M = 19.56$, $SD = 3.48$). Within exogenous motivation, "Dependence on Others' Evaluations" ranked highest ($M = 19.05$, $SD = 3.68$), followed by "Choosing Simple Tasks" ($M = 13.08$, $SD = 2.46$) and "Focusing on Interpersonal Competition" ($M = 12.76$, $SD = 2.65$). "Pursuit of Rewards" scored lowest ($M = 6.43$, $SD = 1.33$), indicating limited material incentive sensitivity.

4.3 Group Differences in Core Constructs by Demographic Characteristics

Craftsmanship Spirit. Mann-Whitney U and Kruskal-Wallis H tests revealed significant differences across multiple demographic variables. Age showed significant effects across all craftsmanship dimensions ($H = 15.604$ – 21.029 , $p < .01$ to $p < .001$), with older students demonstrating higher levels. School type significantly differentiated Personal Growth ($p = .031$), Cherishing Reputation ($p = .016$), Perseverance and Determination ($p = .002$), and overall craftsmanship ($p = .014$), with public institution students scoring higher. Internship experience significantly differentiated Personal Growth ($p = .019$), Striving for Excellence ($p = .033$), Perseverance and Determination ($p = .006$), and overall craftsmanship ($p = .039$); longer internships (particularly >12 months) were associated with higher scores. Learning level showed significant differences across all dimensions ($H = 17.252$ – 35.567 , $p < .001$), with higher academic performance associated with stronger craftsmanship. Parental education significantly differentiated Cherishing Reputation ($p = .031$), Perseverance and Determination ($p = .008$), and overall craftsmanship ($p = .035$). Sex and major showed no significant effects on most dimensions, except major significantly differentiated Perseverance and Determination ($p < .001$).

Professional Values. Both internal and external professional values demonstrated extensive significant differences across all demographic variables ($p < .001$ for most comparisons). Sex

significantly differentiated almost all internal and external sub-dimensions, with females placing greater emphasis on relationships and stability, and males valuing autonomy, challenge, and material rewards. Age showed systematic differences ($p < .01$), with older students exhibiting more realistic career considerations. School type significantly differentiated values ($p < .001$), with public institution students scoring higher on most dimensions. Major categories showed extensive differences ($p < .001$), reflecting professional subculture influences. Internship experience demonstrated strong effects ($p < .001$), with longer internships associated with more developed value structures. Learning level showed consistent positive associations with value scores ($p < .001$). Parental education significantly differentiated most sub-dimensions ($p < .001$), with higher parental education associated with stronger internal value orientations and lower parental education associated with greater emphasis on security and economic returns.

Learning Motivation. Endogenous and exogenous motivation showed differential patterns across demographic groups. Sex differences were minimal, except females scored higher on "Choosing Simple Tasks" ($p = .023$). Age significantly differentiated both motivation types ($p = .001-.002$), with older students (22–23 years) scoring higher on Challenge, Enthusiasm, and Evaluation Dependence. School type significantly differentiated both motivation types ($p = .001-.01$), with public institution students scoring higher. Major significantly differentiated both motivation types ($p < .001-.001$), with engineering students showing higher Challenge/Enthusiasm and humanities/arts students showing higher Evaluation Dependence. Internship experience significantly differentiated both motivation types ($p = .005-.04$), with longer internships associated with higher motivation. Learning level showed strong positive associations with both motivation types ($p < .001$). Parental education significantly differentiated both motivation types ($p < .001-.001$), with higher parental education associated with stronger endogenous motivation and lower parental education associated with stronger exogenous motivation, particularly Evaluation Dependence and Pursuit of Rewards.

4.4 Correlations Among Craftsmanship Spirit, Professional Values, and Learning Motivation

Spearman rank correlation analysis revealed significant positive associations among all three constructs. Craftsmanship spirit correlated

strongly with endogenous learning motivation ($\rho = .746, p < .001$) and exogenous learning motivation ($\rho = .654, p < .001$). Craftsmanship spirit also correlated significantly with internal professional values ($\rho = .250, p < .001$) and external professional values ($\rho = .440, p < .001$). Professional values showed weaker but significant correlations with learning motivation: internal values correlated with endogenous motivation ($\rho = .231, p < .001$) and exogenous motivation ($\rho = .084, p = .048$); external values correlated with endogenous motivation ($\rho = .319, p < .001$) and exogenous motivation ($\rho = .173, p < .001$). The pattern indicates craftsmanship spirit as the construct most strongly associated with learning motivation.

4.5 Predictors of Endogenous and Exogenous Learning Motivation

Multiple regression analyses examined the predictive effects of craftsmanship spirit dimensions and professional value dimensions on learning motivation, controlling for demographic variables.

Endogenous Motivation. The model explained 71.8% of variance in endogenous motivation ($R^2 = .718$, adjusted $R^2 = .705$, $F(23,531) = 58.644, p < .001$). Significant positive predictors included: Personal Development ($B = 1.311, \beta = .465, p < .001$), Intellectual Stimulation ($B = 0.672, \beta = .214, p < .001$), Personal Growth ($B = 0.477, \beta = .205, p = .001$), Fair Competition ($B = 1.095, \beta = .477, p < .001$), Network Resources ($B = 0.993, \beta = .519, p = .003$), Working Environment ($B = 0.564, \beta = .294, p = .032$), Family Maintenance ($B = 0.775, \beta = .395, p = .005$), Cherishing Reputation ($B = 0.247, \beta = .107, p = .029$), and Perseverance and Determination ($B = 0.246, \beta = .105, p = .026$). Diversity showed a significant negative association ($B = -0.315, \beta = -.157, p = .049$). Notably, both Internal Factors Total ($B = -0.041, \beta = -.195, p = .002$) and External Factors Total ($B = -0.518, \beta = -2.712, p = .014$) showed significant negative associations when specific sub-dimensions were controlled, suggesting construct heterogeneity where overall scores capture residual variance unrelated to—or inversely associated with—endogenous motivation after accounting for key positive sub-dimensions.

Exogenous Motivation. The model explained 64.9% of variance in exogenous motivation ($R^2 = .649$, adjusted $R^2 = .634$, $F(23,531) = 42.668, p < .001$). Significant positive predictors included: Personal Development ($B = 2.078, \beta = .634, p < .001$), Network Resources ($B = 1.531, \beta = .688, p < .001$), Family Maintenance ($B = 1.477, \beta = .648, p < .001$),

.001), Intellectual Stimulation ($B = 0.707, \beta = .194, p < .001$), Creativity ($B = 0.547, \beta = .245, p = .021$), Fair Competition ($B = 0.820, \beta = .307, p = .034$), Colleague Relationships ($B = 0.825, \beta = .372, p = .049$), Personal Growth ($B = 0.460, \beta = .170, p = .013$), Cherishing Reputation ($B = 0.539, \beta = .201, p < .001$), and Perseverance and Determination ($B = 0.315, \beta = .116, p = .028$). Both Internal Factors Total ($B = -0.061, \beta = -.253, p < .001$) and External Factors Total ($B = -0.807, \beta = -3.632, p = .003$) showed significant negative associations, mirroring the pattern observed for endogenous motivation and reinforcing the interpretation that global value scores, after controlling for specific positive sub-dimensions, do not further enhance—and may statistically suppress—motivation.

4.6 Mediating Role of Professional Values in the Craftsmanship–Motivation Relationship

Bootstrap mediation analysis (5,000 resamples) tested whether internal and external professional values mediated the relationship between craftsmanship spirit and learning motivation, with internal and external motivation as separate outcomes.

For the path from craftsmanship spirit to internal learning motivation, the total effect was significant ($\beta = 0.612, 95\% \text{ CI } [0.552, 0.674], p < .001$). The direct effect remained significant after including mediators ($\beta = 0.547, 95\% \text{ CI } [0.482, 0.611], p < .001$). Internal professional values showed a significant positive indirect effect ($\beta = 0.089, 95\% \text{ CI } [0.056, 0.127], p < .001$), indicating partial mediation. External professional values showed a significant negative indirect effect ($\beta = -0.024, 95\% \text{ CI } [-0.045, -0.007], p = .012$), functioning as a suppressor.

For the path from craftsmanship spirit to external learning motivation, the total effect was significant ($\beta = 0.481, 95\% \text{ CI } [0.427, 0.536], p < .001$). The direct effect remained significant ($\beta = 0.513, 95\% \text{ CI } [0.454, 0.572], p < .001$). Internal professional values showed a significant positive indirect effect ($\beta = 0.041, 95\% \text{ CI } [0.016, 0.072], p = .003$). External professional values again showed a significant negative indirect effect ($\beta = -0.073, 95\% \text{ CI } [-0.112, -0.038], p < .001$).

These results indicate that internal professional values positively transmit the association between craftsmanship spirit and both motivation types, whereas external professional values suppress this relationship—that is, when craftsmanship spirit is associated with stronger external value orientations, the expected positive association with motivation is attenuated.

4.7 Discussion

This study examined the interplay among craftsmanship spirit, professional values, and learning motivation in Chinese higher vocational college students. The findings provide empirical evidence for the relationships among these constructs while revealing differential pathways through which internal versus external professional values shape motivation. Several patterns warrant discussion in relation to existing literature.

The Central Role of Craftsmanship Spirit in Learning Motivation

The strong positive correlations between craftsmanship spirit and both endogenous ($\rho = .746$) and exogenous ($\rho = .654$) learning motivation align with theoretical conceptualizations of craftsmanship as an integrated professional disposition encompassing commitment, responsibility, and pursuit of excellence (Zhao Chen et al., 2020; Tan Guangxing, 2023). Students who internalize craftsmanship values—particularly those scoring higher on responsibility, personal growth, and perseverance dimensions—demonstrate stronger motivation across both intrinsic and extrinsic domains. This pattern suggests craftsmanship spirit functions as a foundational psychological resource that supports sustained learning engagement, consistent with Huang Xi's (2025) characterization of vocational students' motivational structure and Yang Yani's (2023) findings on achievement motivation as a link to craftsmanship.

The finding that "Responsibility and Commitment" scored highest among craftsmanship dimensions while "Perseverance and Determination" scored lowest reflects a meaningful developmental pattern. Students appear to develop responsibility awareness through institutional requirements and internship experiences—as Tan Guangxing (2023) noted, "institutionalized skill training promotes improvement in the responsibility dimension"—but face greater challenges in sustaining long-term persistence. This may reflect insufficient opportunities for extended practice: only 23.1% of participants had internship experience exceeding 12 consecutive months. Zhao Xiaoduan's (2019) "All-Perspective Learning Theory" suggests that without stable practical fields and long-term task chains, vocational students struggle to develop deep professional endurance. The lower perseverance scores also align with Guo Da and Zhang Ying's (2025) cultural capital analysis: students from lower-cultural-capital backgrounds (50.5% of participants' parents had junior high school education or below) may lack intergenerational transmission of implicit cultural

capital such as "professional persistence" and "long-term investment" orientations.

Professional Values Structure: Internal Dominance and External Differentiation

The higher internal professional values scores relative to external values (127.12 vs. 116.85) indicate that graduating vocational students prioritize intrinsic career aspects—intellectual stimulation, autonomy, creativity, altruism—over extrinsic conditions. This pattern challenges stereotypes that vocational students are predominantly materially oriented and aligns with Zeng Meihong and Fan Weiqiao's (2024) finding that Generation Z college students generally exhibit strong internal value orientations. The highest-ranked internal dimension, "Intellectual Stimulation" ($M = 12.39$), suggests students seek careers offering knowledge challenges and continuous learning opportunities, consistent with Niu Yafei's (2024) observation that contemporary students value "whether they can keep learning" in professional identity formation.

Within external values, "Personal Development" ranked highest ($M = 11.96$), indicating that even among extrinsic considerations, growth potential remains paramount. "Economic Returns" ranked ninth ($M = 10.32$), substantially lower than stereotypical expectations. This pattern resonates with Xu Mingzhi's (2023) multi-institution survey finding that skilled students attend more to career development space than to income. The relatively high rankings of "Safety" ($M = 10.54$) and "Lifestyle" ($M = 10.59$) among students from predominantly lower-cultural-capital backgrounds align with Guo Da and Zhang Ying's (2025) cultural capital analysis: students from families with limited educational resources tend to value stability and predictable career paths over high-risk, high-competition environments.

Motivation Structure: Exogenous Dominance with Differentiated Sub-dimensions

The mediation analysis revealing distinct roles for internal versus external professional values represents a novel contribution. Internal professional values positively mediated the craftsmanship–motivation relationship for both motivation types, indicating that when craftsmanship spirit is associated with stronger internal value orientations (valuing intellectual stimulation, autonomy, creativity, altruism), the positive association with learning motivation is amplified. This pathway suggests internal values function as a mechanism

through which craftsmanship dispositions translate into motivational engagement.

Conversely, external professional values showed negative indirect effects—functioning as suppressors. When craftsmanship spirit is associated with stronger external value orientations (emphasis on economic returns, security, reputation, relationships), the expected positive association with motivation is attenuated. This pattern may reflect that strong external value orientations introduce competing considerations that divert psychological energy from learning engagement, or that students highly focused on extrinsic career rewards experience learning as instrumental means rather than intrinsically engaging activity. The finding resonates with Huang Xi's (2025) observation that vocational students' extrinsic motivation, while practically necessary, can undermine sustained engagement when not balanced with internalized interest.

These differential mediation pathways have both theoretical and practical significance. Theoretically, they demonstrate that professional values are not monolithic in their motivational effects but function differently depending on value type. Practically, they suggest that cultivating craftsmanship spirit may be most motivationally effective when accompanied by explicit attention to internal value development, whereas unexamined reinforcement of external value orientations may inadvertently suppress the very motivation educators seek to enhance.

Demographic Differentiation: The Shaping Roles of Experience and Capital

The extensive group differences observed across all three constructs reinforce understanding of craftsmanship spirit, professional values, and learning motivation as socially situated and experientially shaped rather than fixed individual traits.

The significant age differences in craftsmanship dimensions, with older students scoring higher, reflect the developmental nature of professional dispositions. As Tan Guangxing (2023) emphasized, craftsmanship cultivation requires cumulative effects of task experience, situational participation, and continuous feedback—processes that unfold over time. Similarly, age-related shifts in professional values—from abstract ideals toward more realistic considerations—align with Guo Da and Zhang Ying's (2025) observation that career

value orientations balance internal and external weights as students approach graduation.

Internship experience emerged as a particularly potent differentiator. Students with longer internships (especially >12 months) scored higher on Personal Growth, Striving for Excellence, and Perseverance and Determination dimensions of craftsmanship, as well as on most professional value dimensions and both motivation types. This pattern supports Zhao Xiaoduan's (2019) claim that real-world task engagement is essential for craftsmanship internalization and Tan Guangxing's (2023) finding that sustained enterprise-based experience promotes value development. The finding that only 23.1% of participants had extended internships (>12 months) suggests substantial untapped potential for experience-based development.

Parental education effects across all three constructs provide empirical support for cultural capital theory (Bourdieu) in vocational education contexts. Students from higher-education families demonstrated stronger internal value orientations, higher craftsmanship levels (particularly on "Cherishing Reputation" and "Perseverance"), and stronger endogenous motivation. Conversely, students from lower-education families showed greater emphasis on external values (economic returns, safety) and stronger exogenous motivation (evaluation dependence, reward pursuit). These patterns align with Guo Da and Zhang Ying's (2025) analysis that family cultural capital shapes career expectations, learning motivation structure, and value preferences through educational expectations, value guidance, and resource support.

The Paradox of Global Value Scores: Construct Heterogeneity and Statistical Suppression

One of the more complex findings concerns the negative associations of global internal and external professional value scores with both motivation types when specific sub-dimensions are controlled in regression models. This pattern—which might superficially suggest that professional values are detrimental to motivation—requires careful interpretation consistent with measurement theory and construct heterogeneity.

When multiple specific sub-dimensions (e.g., Personal Development, Intellectual Stimulation, Network Resources) are included simultaneously with their aggregate total scores, the total scores represent residual variance not captured by those specific positive sub-dimensions. This residual variance may comprise value components less directly relevant to—or even incompatible with—the motivation types under investigation. For example, the internal values total includes dimensions such as "Diversity" (which showed a significant negative association with endogenous

motivation) alongside positive predictors. When the positive predictors' variance is partitioned out, the remaining global score may reflect value orientations that are diffuse, unintegrated, or instrumentally oriented in ways that do not support—and may statistically suppress—motivation.

This interpretation aligns with Zeng Meihong and Fan Weiqiao's (2024) observation that professional values are not unidimensional but comprise differentiated components with potentially distinct functional relationships to outcomes. The finding underscores the importance of examining specific value dimensions rather than relying solely on global scores—a methodological implication for future research and a practical implication for educational interventions.

Mediation Pathways: Internal Values as Bridge, External Values as Suppressor

The mediation analysis revealing distinct roles for internal versus external professional values represents a novel contribution. Internal professional values positively mediated the craftsmanship–motivation relationship for both motivation types, indicating that when craftsmanship spirit is associated with stronger internal value orientations (valuing intellectual stimulation, autonomy, creativity, altruism), the positive association with learning motivation is amplified. This pathway suggests internal values function as a mechanism through which craftsmanship dispositions translate into motivational engagement.

Conversely, external professional values showed negative indirect effects—functioning as suppressors. When craftsmanship spirit is associated with stronger external value orientations (emphasis on economic returns, security, reputation, relationships), the expected positive association with motivation is attenuated. This pattern may reflect that strong external value orientations introduce competing considerations that divert psychological energy from learning engagement, or that students highly focused on extrinsic career rewards experience learning as instrumental means rather than intrinsically engaging activity. The finding resonates with Huang Xi's (2025) observation that vocational students' extrinsic motivation, while practically necessary, can undermine sustained engagement when not balanced with internalized interest.

These differential mediation pathways have both theoretical and practical significance. Theoretically, they demonstrate that professional values are not monolithic in their motivational effects but function differently depending on value

type. Practically, they suggest that cultivating craftsmanship spirit may be most motivationally effective when accompanied by explicit attention to internal value development, whereas unexamined reinforcement of external value orientations may inadvertently suppress the very motivation educators seek to enhance.

Limitations

Several limitations warrant consideration. First, the cross-sectional design precludes causal inference; relationships identified are associational rather than causal. Second, reliance on self-report measures introduces potential method bias and shared variance inflation. Third, the sample, while reasonably large and diverse, was drawn from only two institutions in a single Chinese province, limiting generalizability. Fourth, the study focused on graduating students; developmental trajectories across the full vocational education experience remain unexamined. Fifth, the negative associations of global value scores, while interpretable as construct heterogeneity, may also reflect measurement or statistical artifacts requiring replication. Sixth, the study did not include behavioral outcome measures (e.g., actual learning performance, skill acquisition rates) that would strengthen validity of the motivation findings.

Implications

The findings carry implications for vocational education practice. First, the strong associations between craftsmanship spirit and motivation suggest that deliberate cultivation of craftsmanship—through extended internships, project-based learning, and mentor modeling—may enhance learning engagement. Second, the differentiated roles of internal versus external values indicate that value education should be specific rather than global: emphasizing intellectual stimulation, autonomy, and growth opportunities may be more motivationally effective than general appeals to "professional values." Third, the suppressing effect of external values suggests caution in overemphasizing extrinsic rewards and career security; while practically important, such messages may need balancing with internal value cultivation to sustain motivation. Fourth, the significant internship effects support policies extending and deepening work-integrated learning experiences. Fifth, the parental education effects highlight the need for institutional support structures that compensate for differential family cultural capital, particularly for first-generation vocational students.

5. Conclusions and Recommendations

5.1 Conclusions

This study investigated the relationships among craftsmanship spirit, professional values, and learning motivation in Chinese higher vocational college students. Based on the findings, the following conclusions are drawn:

First, graduating higher vocational students demonstrate above-average levels of craftsmanship spirit, professional values, and learning motivation. Among craftsmanship dimensions, responsibility and commitment are most developed, while perseverance and determination require strengthening—suggesting that institutional and internship experiences effectively cultivate accountability but provide insufficient support for sustained persistence in long-term skill development.

Second, students exhibit a predominantly internal professional value orientation, prioritizing intellectual stimulation, autonomy, and personal growth over external rewards. This pattern challenges assumptions that vocational students are primarily materially motivated and aligns with broader generational shifts toward meaning-oriented career expectations. However, external values—particularly personal development, fair competition, and network resources—remain salient, reflecting students' pragmatic career considerations.

Third, learning motivation is characterized by exogenous dominance, with strong dependence on external evaluation alongside meaningful endogenous interest in challenge-oriented tasks. The lowest-ranked "pursuit of rewards" dimension indicates that material incentives are not primary drivers, suggesting that motivational interventions should focus on evaluation structures and task design rather than extrinsic rewards.

Fourth, craftsmanship spirit, professional values, and learning motivation are systematically associated with demographic factors representing accumulated experience and cultural capital. Age, internship duration, academic level, and parental education consistently differentiate all three constructs, whereas sex and major show limited effects. These patterns support understanding these psychological qualities as socially situated and experientially developed rather than fixed individual traits.

Fifth, craftsmanship spirit is strongly associated with both endogenous and exogenous

learning motivation. Internal professional values positively mediate this relationship, whereas external professional values function as suppressors—attenuating the positive craftsmanship–motivation association. This differential mediation pattern indicates that professional values are not monolithic in their motivational effects and suggests that cultivating craftsmanship alongside internal value orientations may be particularly conducive to learning engagement.

Sixth, the negative associations of global professional value scores with motivation when specific positive sub-dimensions are controlled reflect construct heterogeneity rather than substantive negative effects. This finding underscores the importance of examining specific value dimensions in both research and educational practice, as global scores may obscure differentiated functional relationships.

5.2 Recommendations

For Higher Vocational Students

Students may benefit from actively seeking extended, high-quality internship experiences that provide opportunities for sustained skill practice and professional identity development. Participation in skills competitions, project-based learning, and enterprise-based training can help transform initial interest in "challenge" into stable internalized motivation. Students should also develop awareness of their professional value orientations, recognizing that over-reliance on external evaluation may limit long-term learning engagement, and cultivate reflective practices that strengthen internal motivation.

For Parents and Families

Parents, particularly those from lower-cultural-capital backgrounds, can support students' professional development through attention to learning processes rather than outcomes alone, recognition of effort, and encouragement of career exploration. Positive emotional support and reasonable expectations contribute to students' learning engagement and value development even when direct academic guidance is limited. Families may also facilitate internship opportunities and career discussions that broaden students' professional horizons.

For Vocational Colleges

Institutions should prioritize extending and deepening internship experiences, as sustained practice (≥ 12 months) is associated with stronger craftsmanship, more developed values, and

enhanced motivation. Practical teaching systems should incorporate long-term project-based learning that requires sustained effort and provides progressive skill challenges. Evaluation systems should balance outcome assessment with process-oriented feedback to reduce excessive dependence on external evaluation. Curriculum design should explicitly integrate professional values education, emphasizing internal value dimensions—intellectual stimulation, autonomy, creativity, personal growth—rather than generic value appeals. Career guidance should help students differentiate among value dimensions and understand how internal value orientations support sustained motivation.

For Government and Policy Makers

Policy initiatives should promote industry-education integration that provides students with stable, standardized internship environments and clear career pathways. Resource allocation should support extended internship programs, particularly for students from lower-cultural-capital backgrounds who may lack family-based career resources. Social recognition of skilled technical talent should be enhanced through institutional mechanisms that strengthen the perceived value of craftsmanship and vocational careers, reinforcing internal value orientations at the macro level.

Recommendations for Future Research

Subsequent studies should replicate this investigation in larger, geographically diverse samples to establish generalizability. Longitudinal designs are needed to examine developmental trajectories of craftsmanship, values, and motivation across the full vocational education experience and into early career stages. Future research should incorporate behavioral outcome measures (skill acquisition rates, learning performance, employment outcomes) to complement self-report data. The differential mediation pathways identified here warrant experimental or quasi-experimental investigation to establish causal relationships. Additionally, research should explore potential moderators of the craftsmanship–motivation relationship, including teacher support, peer influence, institutional culture, and workplace mentoring quality. Finally, qualitative studies could illuminate how students experience and internalize craftsmanship and values, providing richer understanding of the processes underlying the quantitative patterns observed.

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7. Tables

Table 1. Demographic characteristics of respondents (n = 555).

Profile	Frequency (f)	Percentage (%)
Sex		
Male	324	58.4
Female	231	41.6
Age		
20	115	20.7
21	283	51.0
22	122	22.0
23	35	6.3
Type of School		
Private	239	43.1
Public	316	56.9
Major		
Science	84	15.1
Engineering	204	36.8
Liberal Arts	193	34.8
Art	74	13.3
Internship Experience		
none	181	32.6
1-6 months	168	30.3
7-12 months	78	14.1
more than 12 months	128	23.1
Learning Level		
subaverage	69	12.4
average	239	43.1
above-average	152	27.4
uncertainty	96	17.3
Educational background of parents		
Junior high school and below	280	50.5
senior high school	137	24.7
junior college	111	20.0
undergraduate	26	4.7
postgraduate	1	0.2

Table 2. Levels of craftsmanship spirit, professional values, and learning motivation (descriptive statistics).

Craftsmanship Spirit

Variables/Subscales	Weighted Mean	Std. Dev.	Rank	Verbal Interpretation
Responsibility and Commitment	17.0937	3.36555	1	Above Average
Personal Growth	16.8847	3.46061	2	Above Average
Striving for Excellence	16.6973	3.46232	3	Above Average
Cherish reputation	16.0829	3.49269	4	Above Average
Perseverance and determination	15.8991	3.44067	5	Above Average
Craftsmanship Scale Overall	82.6577	15.78242		Above Average

Professional Values

Variables/Subscales	Weighted Mean	Std. Dev.	Verbal Interpretation	Rank
Intellectual Stimulation	12.3856	2.57364	Above Average	1
Autonomy	10.5676	4.34982	Average	2
Altruism	10.4865	4.35489	Average	3
Creativity	10.2523	4.20518	Average	4
Achievement	10.0162	4.00110	Average	5
Diversity	9.9009	4.01341	Average	6
Internal Factors TOTAL	127.1225	38.74022		
Personal Development	11.9604	2.86493	Average	1
Fair Competition	11.0559	3.51461	Average	2
Network Resources	10.6991	4.21548	Average	3
Lifestyle	10.5856	4.09955	Average	4
Safety	10.5405	4.20414	Average	5
Reputation	10.5081	4.23854	Average	6
Colleague Relationships	10.4847	4.22999	Average	7
Working Environment	10.3315	4.20482	Average	8
Economic Returns	10.3153	4.24388	Average	9
Supervisory Relationships	10.2955	4.35176	Average	10
Family Maintenance	10.0703	4.11791	Average	11
External Factors TOTAL	116.8468	42.25563		

Learning Motivation of the Respondents

Variables/Subscales	Weighted Mean	Std. Dev.	Verbal Interpretation	rank
Challenge	26.0198	4.81176	Above Average	1
Enthusiasm	19.5586	3.47992	Above Average	2
Endogenous Motivation	45.5784	8.06845		
Dependence on Others Evaluation	19.0450	3.67887	Average	1
Choosing Simple Tasks	13.0811	2.45587	Above Average	2
Focusing on Interpersonal Competition	12.7550	2.64530	Average	3
Pursuing Rewards	6.4252	1.33249	Above Average	4
Exogenous Motivation	51.3063	9.38294		

Table 3. Group differences in craftsmanship spirit, professional values, and learning motivation by respondent profile (Mann-Whitney U / Kruskal-Wallis H).

Differences of Responses on Craftsmanship Scale Scores when grouped according to Profile (n = 555)

Profile Variables	Craftsmanship Scale		
	H/U	p-Value	Interpretation
Sex	36125	0.484	Not Significant
Age	21.029	0	Significant
Type of School	33167.5	0.014	Significant
Major	5.795	0.122	Not Significant
Internship Experience	8.368	0.039	Significant
Learning Level	25.7	0	Significant
Educational Background of Parents	10.339	0.035	Significant

Differences of Responses on Professional Values Scale Scores when grouped according to Profile (n = 555)

Profile Variables	Internal Factors			External Factors		
	H/U	p-Value	Interpretation	H/U	p-Value	Interpretation
Sex	18540	0	Significant	19653.5	0	Significant
Age	18.106	0	Significant	15.881	0.001	Significant
Type of School	26268.5	0	Significant	29833	0	Significant
Major	124.296	0	Significant	108.42	0	Significant
Internship Experience	144.172	0	Significant	125.196	0	Significant
Learning Level	133.966	0	Significant	94.953	0	Significant
Educational Background of Parents	96.761	0	Significant	74.845	0	Significant

Differences of Responses on Learning Motivation Scale Scores when grouped according to Profile (n = 555)

Profile Variables	Endogenous Motivation			Exogenous Motivation		
	H/U	p-Value	Interpretation	H/U	p-Value	Interpretation
Sex	35001	0.189	Not Significant	34120.5	0.074	Not Significant
Age	15.224	0.002	Significant	16.142	0.001	Significant
Type of School	32963.5	0.01	Significant	31585.5	0.001	Significant
Major	16.067	0.001	Significant	33.908	0	Significant
Internship Experience	8.302	0.04	Significant	12.997	0.005	Significant
Learning Level	33.096	0	Significant	48.227	0	Significant
Educational Background of Parents	19.632	0.001	Significant	29.403	0	Significant

Table 4. Spearman correlations among craftsmanship spirit, professional values, and learning motivation.

Variables	<i>Spearman-rho</i>	p-Value	Interpretation
CRAFTSMANSHIP			
Professional Values			
<i>Internal</i>	.250	0.000	Significant
<i>External</i>	.440	0.000	Significant
Learning Motivation			
<i>Endogenous</i>	.746	0.000	Significant
<i>Exogenous</i>	.654	0.000	Significant
PROFESSIONAL VALUES			
Internal			
Learning Motivation			
<i>Endogenous</i>	.231	0.000	Significant
<i>Exogenous</i>	.084	0.048	Significant
External			
Learning Motivation			
Endogenous	.319	0.000	Significant
Exogenous	.173	0.000	Significant

Table 5. Multiple regression models predicting endogenous and exogenous learning motivation.

a. Predicting endogenous learning motivation

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
						F Change	df1	df2	
1	.847 ^a	0.718	0.705	4.38014	0.718	58.644	23	531	0.000

a. Predictors: (Constant), External factors TOTAL, Perseverance and determination Mean, intellectual stimulation, Cherish reputation Mean, Responsibility and Commitment Mean, internal factors TOTAL, Personal Growth Mean, personal development, Striving for Excellence Mean, achievement, family maintenance, diversity, fair competition, creativity, autonomy, safety, working environment, economic returns, reputation, altruism, lifestyle, colleague relationships, network resources

Model		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.685	1.257		10.095	0.000
	Personal Growth Mean	0.477	0.142	0.205	3.349	0.001
	Cherish reputation Mean	0.247	0.113	0.107	2.195	0.029
	Perseverance and determination Mean	0.246	0.110	0.105	2.232	0.026
	diversity	-0.315	0.160	-0.157	-1.970	0.049
	intellectual stimulation	0.672	0.143	0.214	4.706	0.000
	internal factors TOTAL	-0.041	0.013	-0.195	-3.140	0.002
	personal development	1.311	0.282	0.465	4.649	0.000
	fair competition	1.095	0.297	0.477	3.691	0.000
	working environment	0.564	0.263	0.294	2.146	0.032
	network resources	0.993	0.331	0.519	3.005	0.003
	family maintenance	0.775	0.274	0.395	2.830	0.005
	External factors TOTAL	-0.518	0.210	-2.712	-2.466	0.014

a. Dependent Variable: Endogenous Motivation

b. Predicting exogenous learning motivation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
						F Change	df1	df2	
1	.806 ^a	0.649	0.634	5.67891	0.649	42.668	23	531	0.000

a. Predictors: (Constant), External factors TOTAL, Perseverance and determination Mean, intellectual stimulation, Cherish reputation Mean, Responsibility and Commitment Mean, internal factors TOTAL, Personal Growth Mean, personal development, Striving for Excellence Mean, achievement, family maintenance, diversity, fair competition, creativity, autonomy, safety, working environment, economic returns, reputation, altruism, lifestyle, colleague relationships, network resources

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	17.530	1.629		10.760	0.000
	Personal Growth Mean	0.460	0.185	0.170	2.491	0.013
	Cherish reputation Mean	0.539	0.146	0.201	3.689	0.000
	Perseverance and determination Mean	0.315	0.143	0.116	2.206	0.028
	intellectual stimulation	0.707	0.185	0.194	3.820	0.000
	creativity	0.547	0.237	0.245	2.312	0.021
	internal factors TOTAL	-0.061	0.017	-0.253	-3.653	0.000
	personal development	2.078	0.365	0.634	5.685	0.000
	fair competition	0.820	0.385	0.307	2.132	0.034
	colleague relationships	0.825	0.417	0.372	1.977	0.049
	network resources	1.531	0.429	0.688	3.574	0.000
	family maintenance	1.477	0.355	0.648	4.161	0.000
	External factors TOTAL	-0.807	0.272	-3.632	-2.962	0.003

a. Dependent Variable: Exogenous Motivation

Table 6. Bootstrap mediation results for professional values in the craftsmanship–motivation relationship (5,000 resamples).

Bootstrap Test of Mediating Effect of Professional values between Craftsmanship Spirit and Learning Motivation
n=555

Path	Effect Type	Effect value	Boot SE	Boot LLCI	Boot ULCI	P
CS → ILM	Total effect	0.612	0.031	0.552	0.674	< .001
CS → ILM	Direct effect	0.547	0.033	0.482	0.611	< .001
CS → IPV → ILM	Indirect effect	0.089	0.018	0.056	0.127	< .001
CS → EPV → ILM	Indirect effect	-0.024	0.01	-0.045	-0.007	0.012
CS → ELM	Total effect	0.481	0.028	0.427	0.536	< .001
CS → ELM	Direct effect	0.513	0.03	0.454	0.572	< .001
CS → IPV → ELM	Indirect effect	0.041	0.014	0.016	0.072	0.003
CS → EPV → ELM	Indirect effect	-0.073	0.019	-0.112	-0.038	< .001

Dependent Variable: Professional values

Mediator Variable: Craftsmanship Spirit

Independent Variable: Learning Motivation

Note:

Bootstrap sample = 5000. CI = 95%.

CS = Craftsmanship Spirit; IPV = Internal Professional Values; EPV = External Professional Values;

ILM = Internal Learning Motivation; ELM = External Learning Motivation

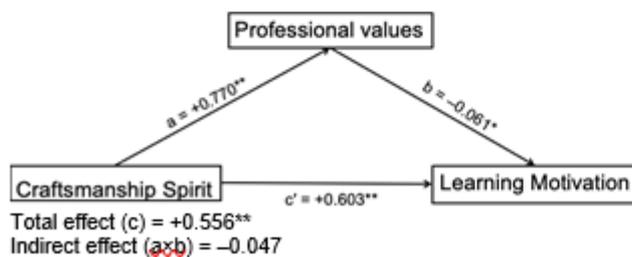


Figure 1: Mediation Path Diagram