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Beyond quality labels: do international accreditation–driven reforms improve internship performance? Evidence from China

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Introduction: In higher education, accreditation is increasingly viewed not only as a quality assurance mechanism but also as a driver of program-level educational reform. This study investigates whether international accreditation–driven reforms are associated with improvements in students' internship performance.
Methods: Employing the entropy method and a difference-in-differences (DID) method, the analysis draws on 2,594 internship evaluations from a university in Guangzhou, China, during 2017–2023, based on supervisor-rated assessments within a specific placement context.
Results: The findings reveal that accreditation-driven reforms are associated with higher internship performance within structured placement contexts. Heterogeneity analysis shows that statistically significant associations are observed in finance, trade, manufacturing, and technology sectors, whereas no significant associations are detected in education and healthcare placements. In addition, the estimated coefficients are comparatively larger for female students than for male students, suggesting variation in internship performance across gender groups within the evaluated context.
Discussion: By treating international accreditation as a program-level institutional reform within a quasi-experimental setting, this study provides new empirical evidence from the Chinese context and offers policy-relevant insights for higher education institutions, accrediting bodies, and policymakers.

KEYWORDS
DID method, higher education reform, international accreditation, internship performance, learning environment

1 Introduction and literature review

Accreditation has become a central focus in education, particularly in business and management disciplines, as it is closely tied to educational quality, student development, and learning support. The International Accreditation Council for Business Education (IACBE) was founded in 1997 and is recognized by the Council for Higher Education Accreditation (CHEA). The IACBE is a leading mission-driven and outcomes-based programmatic accreditation organization in business and management education for student-centered colleges, universities, and other higher education institutions throughout the world. It has accredited over 1,500 business and business-related programs across the United States, Europe, Asia, and other regions.

This university in Guangzhou, China, became an IACBE member institution in 2013. The International Economics and Trade program entered the candidacy stage in 2016, and accreditation-driven reforms were officially initiated in 2017. Since then, systematic assessment tools have been introduced to monitor student learning outcomes and teaching performance. These continuous improvement measures have progressively refined curriculum alignment and instructional practices, contributing to a more structured learning and assessment framework within the program.

The primary objective of professional and social accreditation extends beyond the evaluation of program quality, functioning as a strategic mechanism that promotes institutional learning and holistic student development (Klochkova, 2017). In this sense, educational quality can be understood as a transformative experience that goes beyond formal assessment, fostering growth in both academic and emotional dimensions (Harvey and Green, 1993). This developmental perspective emphasizes that accreditation should not be viewed merely as external evaluation but as an ongoing process that enhances the learning environment and enriches the student experience. Within this process, evaluation committees conduct comprehensive consultations and interviews with diverse stakeholders—including administrators, deans, students, alumni, employers, and faculty members—to assess institutional effectiveness. To support this rigorous review, universities prepare detailed self-assessment reports outlining their achievements, challenges, and improvement initiatives. The experts' appraisal relies on a multi-dimensional approach that combines document analysis, supplementary evidence, and on-site observations. Such an integrative methodology ensures aims to enhance comprehensiveness and consistency in evaluation procedures, encouraging continuous improvement in educational practices and institutional governance.

Reflecting on the nature of accreditation and its influence on higher education has become increasingly important (Dassa et al., 2017). Accreditation functions both as a framework for institutional self-evaluation and as a mechanism for improving teaching quality and organizational responsiveness. Empirical research has shown that accreditation can generate competitive advantages for institutions, as demonstrated in Lebanese business schools (Chedrawi et al., 2019), and can act as a catalyst for change that stimulates program innovation and enhancement (Elliott and Goh, 2013). Beyond improving administrative or structural aspects, the purpose of university education is also to cultivate professional competence alongside intellectual and personal growth (Butt, 2024). Guided by learning outcomes and core competencies, accreditation encourages universities to refine program orientation, curriculum systems, teaching conditions, and faculty development. Such comprehensive reform has been shown to strengthen program quality and improve the effectiveness of talent cultivation (Xu Z. et al., 2024; Xu Y. et al., 2024). Furthermore, Leiber et al. (2015) emphasize that accreditation and quality assurance processes can indirectly enhance students' learning engagement and emotional experience through structured feedback, faculty training, and continuous improvement mechanisms. Beyond serving as an internal driver of reform, international accreditation also enhances collaboration and reflective learning within the global higher education community. Through peer review, benchmarking, and international cooperation, accreditation promotes the exchange of best practices and encourages institutions to build supportive learning environments that empower students academically and socially (Sziegat, 2021). Collectively, these findings suggest that when effectively implemented, accreditation serves not merely as an evaluative procedure but as a supportive educational mechanism. Such environments align with the growing emphasis in educational research on integrating academic and socio-emotional support, which strengthens students' engagement, confidence, and readiness for future employment (Trapnell, 2007; Sziegat, 2021).

Despite these benefits, scholars have also raised concerns about the potential constraints of accreditation. While self-evaluation is a crucial component (Mo and Ulmet, 2019; Meuret and Morlaix, 2003), the validity of this process can be questioned, as external standards sometimes impose uniform expectations on institutional management, teaching philosophy, and classroom practices. To meet accreditation criteria, instructors may limit creativity when designing learning activities (Coutet, 2022). Some scholars argue that the process can exert a restraining effect, compelling institutions to conform to standardized organizational models (Fertig, 2007). Jay (2018) further reported that even schools with poor classroom engagement had been certified, suggesting potential gaps between formal compliance and actual educational quality.

Existing studies predominantly focus on institutional reputation, governance, or signaling effects, with limited empirical evidence on student-level outcomes, particularly internship performance. Although accreditation is often discussed as a quality assurance mechanism, its influence on structured workplace learning experiences has rarely been empirically examined. Moreover, little is known about whether the effects of accreditation-driven reforms vary across internship industries and student characteristics, such as gender. To address these gaps, this study pursues the following two objectives. First, it aims to examine whether international accreditation–driven reforms are associated with changes in students' internship performance, measured through supervisor-rated evaluations within specific placement contexts. Second, it investigates the heterogeneity of accreditation effects across internship industries and gender to assess whether such reforms are associated with differentiated outcomes among student groups. The structure of the remaining part of this paper is as follows: Section II describes the materials and methods. Section III presents the empirical results. Section IV reports the heterogeneity analysis. Section V concludes with policy implications.

2 Materials and methods

2.1 Data sources and hypothesis

The accreditation process of the International Economics and Trade program at this university provides a quasi-natural experimental setting to examine the association between international accreditation and student internship performance. The program was granted IACBE candidacy status in December 2016, after which accreditation-driven reforms were implemented beginning in 2017, including adjustments to teaching conditions, assessment systems, and curriculum alignment with learning outcomes. During the same period, the Financial Engineering program within the same School of Economics did not undergo international accreditation and therefore serves as a natural comparison group. This exogenous policy change enables the application of a DID approach to estimate program-level associations. The underlying assumption is that, in the absence of international accreditation, internship performance

trends of students in International Economics and Trade would have evolved in parallel with those of students in Financial Engineering; therefore, any significant change in performance observed after accreditation is interpreted as being associated with accreditation-driven reforms. Based on this logic, the study proposes the following hypothesis: educational reforms induced by international accreditation are associated with improvements in students' internship performance.

Each student in the program undertakes a three-month internship in a company during their senior year. Guided by the IACBE's seven core learning outcomes, an online questionnaire was developed and distributed to internship employers or supervisors. The internship evaluation questionnaire was designed as part of the university's routine internship assessment system and is aligned with outcome-based education principles emphasized by international accreditation standards. The evaluation items cover multiple dimensions of students' workplace performance, including applied skills, professional behavior, communication, and adaptability, thereby ensuring content validity. Each year, 190 internship supervisors were invited to complete the survey using a five-point Likert scale (Likert, 1932). Respondents were informed about the study's purpose and provided implied consent through participation. The scale ranged from 1 to 5, where 5 indicated strong agreement ("Yes"), 4 general agreement ("Basically OK"), 3 neutral ("Not sure"), 2 disagreement ("Hardly"), and 1 strong disagreement ("Not at all"). To assess internal consistency, reliability analysis was conducted at the item level, and the overall scale demonstrated satisfactory internal consistency. The survey was administered annually each March from 2017 to 2023, with data collection concluding in April. This process resulted in a balanced panel dataset covering the period 2017–2023, allowing for robust Difference-in-Differences estimation of accreditation effects on student internship outcomes. The final sample consists of 2,594 internship evaluations, representing the full population of eligible students from both the International Economics and Trade and Financial Engineering programs who completed internships during the study period rather than a selected subsample. The multi-year and multi-cohort nature of the data ensures adequate variation for estimating accreditation effects using the DID approach.

Within the DID framework, international accreditation–driven reforms are treated as a program-level institutional intervention, while students' internship performance serves as the primary outcome variable. Individual academic ability, language proficiency, prior performance, and engagement-related indicators are included as control variables to account for pre-existing differences among students. Heterogeneity analyses by internship industry and gender are conducted as structured extensions of this framework to examine whether the association between accreditation reforms and internship performance varies across contexts and student groups. It should be emphasized that internship evaluations are supervisor-assessed measures conducted within an institutionally structured framework, and therefore reflect perceived performance within a specific evaluation context rather than an independent or fully objective indicator of overall competence.

2.2 Research methods and variable description

On the basis of constructing an evaluation index system, this study uses the entropy method to analyze the performance of the interns (Han et al., 2015; Wang and Dong, 2023). The specific steps are as follows:

First, according to the index attributes, the evaluation data are standardized with the help of the entropy method (Equation 1):

Forward standardization formula:

$$X_{ij} = \left(X_{ij} - X_{minij}\right) / \left(X_{maxij} - X_{minij}\right) \tag{1}$$

Where X_{ij} represents the evaluation standard value, X_{minij} represents the minimum value of the j-th item of the i-th student, and X_{maxij} represents the maximum value of the j-th item of the i-th student.

Second, calculate the characteristic proportion of the j-th index (Equation 2):

$$P_{ij} = X_{ij} / \sum_{i=1}^{n} X_{ij} \tag{2}$$

Third, calculate the index of the information entropy (Equation 3):

The information entropy calculation formula of the j-th index of the i-th student can be expressed as:

$$e_j = -k \sum_{i=1}^{n} P_{ij} * \ln P_{ij} \tag{3}$$

Fourth, calculate the dispersion of the evaluation index (Equation 4):

$$d_j = 1 - e_j \tag{4}$$

Fifth, calculate the weight of the evaluation index (Equation 5):

$$w_j = d_j / \left(\sum_{j=1}^{n} d_j \right) \tag{5}$$

Sixth, according to the obtained comprehensive score of the index weight, the comprehensive index of performance is calculated (Equation 6):

$$Score_i = \sum_{j=1}^{n} \left(w_j * X_{ij} \right) \tag{6}$$

Where $Score_i$ represents the comprehensive index, and n is the number of indexes under all levels in the evaluation system, which is 7.

The DID method is then employed to examine the association between international accreditation and students' internship performance by exploiting temporal and cross-program variation in reform exposure. Although accreditation-driven reforms were formally initiated in 2017, the policy dummy is set to 1 only for years after 2020. This specification reflects the structure of undergraduate training and internship arrangements, as students typically complete internships in their final year of study. Students who entered the program in 2017 constitute the first cohort fully exposed to accreditation-driven reforms throughout their entire undergraduate training cycle.

TABLE 1 Descriptive statistics of the main variables.

Variables	Obs.	Mean	SD	Min.	Max.
Score	2,594	0.835	0.138	0.180	1
GP	2,638	3.152	0.345	1.510	3.840
Ability	2,570	6.154	0.156	5.403	6.394
CBE	2,638	4.363	0.091	4.060	4.580
FTE	2,638	4.416	0.119	3.258	4.595
CE	2,592	1.293	1.056	0	6

Consequently, cohorts graduating before 2020 were not fully exposed to the reformed learning environment throughout their period of study.[1]

Accordingly, the specific model setting is as follows (Equation 7):

$$Score_{it} = \alpha + \beta did_{it} + \gamma X_{it} + \mu_i + f_t + \varepsilon_{it} \quad (7)$$

$$did_{it} = treat_i \times policy_t \quad (8)$$

Where i refers to the student and t refers to the year; and $Score_{it}$ is the explained variable, that refers to the internship performance. did_{it} consists of the interaction terms of the time and grouping dummy variables ($treat_i$=1 if student i belongs to the International Economics and Trade program, which was exposed to accreditation-driven reforms, and 0 if the student belongs to the Financial Engineering program; $policy_t$=1 if time t is after 2020, otherwise, it is 0). did_{it}, calculated as Equation 8, is the key explanatory variable of the DID method. α is the constant term; β is the coefficient of did_{it}, and its estimated value reflects the impact of the international accreditation and a series of educational reforms resulting from it; $\times_{it}$ is a set of control variables; f_t represents the time fixed effect, μ_i repesents the individual fixed effect of each student; ε_{it} represents the random interference term (Sun et al., 2023).

Control variables: This study selected a series of control variables to control for the impact of other factors on internship performance. Students' ability in learning (Ability) is expressed as the logarithm of their entrance score. Foreign language literacy (CBE) is expressed as the logarithm of the average score of Cambridge Business EnglishIand Cambridge Business EnglishII. Listening and speaking ability (FTE) is expressed as the logarithm of foreign trade English listening and speaking course score. In addition, the control variables are the logarithm of the sum of the number of competitions and events in which the student participated (CE) and each student's grade point (GP) (Supriyanto et al., 2022).

The descriptive statistical results of the main variables are reported in Table 1. The descriptive statistics of the main variables are presented in Table 1. The dependent variable, which reflects students' overall internship performance as evaluated by supervisors, has a mean value of 0.835 and a standard deviation of 0.138. The minimum value is 0.18, while the maximum reaches 1.00, indicating that some interns received full scores in their evaluations. This suggests that a portion of students demonstrated outstanding performance during their internships. Among the control variables, the variable with the highest standard deviation is the number of internship-related events in which a student participated. This variable ranges from 0 to 6, reflecting considerable variation in student engagement—some students did not participate in any events, while others engaged in as many as six. Overall, the distribution of internship performance is relatively stable, with most students receiving evaluations clustered around the mean, indicating a generally consistent level of performance across the sample.

3 Results

3.1 Baseline regression results

Model 7 estimates the association between IACBE professional accreditation-driven educational reforms and internship performance, and the regression results are reported in Table 2.

Columns 1 and 2 report the results of regression without control variables and regression with control variables under the control of time fixed effects and individual fixed effects. The empirical results indicate that the regression coefficients of DID are significantly positive at the 1% level, suggesting that international accreditation is associated with higher internship performance. Specifically, international accreditation has led to an increase of 0.072 points in internship performance scores compared to students not subject to accreditation, thereby verifying the proposed hypothesis.

3.2 Parallel trend test

The key prerequisite assumption for the validity of the DID method is the parallel trend assumption. The performance scores of the treatment group and the control group before and after international accreditation were consistent with the change of time. Therefore, this study uses the event study method for parallel trend testing (Jacobson et al., 1993), and the econometric model is specified as follows (Equation 9):

$$Y_{it} = \alpha + \sum_{t=-3}^{3} \varphi_t did_{it} + \gamma X_{it} + \mu_i + f_t + \varepsilon_{it} \quad (9)$$

Where did_{it} is a set of dummy variables. If student i received the teaching resources after the educational reforms in year t, then did_{it}=1 and 0 otherwise. Its coefficient φ_t is the object of focus of the parallel trend test, reflecting the difference between the treatment group and the control group students after the international accreditation. The rest of the variables have the same meanings as those in model 7.

Based on the distribution characteristics of the sample data, the data before the international accreditation are aggregated to period −3, and the data after the accreditation are aggregated to period 3. When $t < 0$, φ_t is the effect of the treatment group students before the accreditation. $t = 0$ is the processing effect of students enrolled in the

1 Although accreditation-driven reforms primarily targeted students entering the program in 2017 and thereafter, earlier cohorts (e.g., students graduating in 2018–2019 who entered before 2017) may have been indirectly exposed to limited reform-related spillovers during the transition period. Such exposure mainly took the form of incremental improvements in the learning environment and faculty engagement associated with accreditation preparation, rather than comprehensive curriculum or pedagogical changes. These indirect and low-intensity influences are therefore interpreted as potential anticipation effects and are unlikely to generate systematic or comparable impacts on internship performance.

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TABLE 2 Benchmark regression results.

Variable	(1) Score	(2) Score
did	0.0718***	0.0723***
	(0.010)	(0.010)
Ability		−0.0325
		(0.024)
CBE		0.0182
		(0.041)
FTE		0.4158***
		(0.030)
CE		0.0062**
		(0.003)
GP		0.0066
		(0.013)
Constant	0.8162***	−0.9299***
	(0.003)	(0.207)
Observations	2,584	2,487
R-squared	0.211	0.311
Year fixed effects	Yes	Yes
Individual fixed effects	Yes	Yes

*, **, and *** indicate significance levels of 10, 5, and 1%. Robust standard errors in parentheses.

year when the educational reforms began. When $t > 0$, $\ddot{o}_t$ captures the dynamic effects of students who have accepted the educational reforms. To show the results of the parallel trend test more visually, this study draws a trend chart of the estimated coefficient of did_{it} under a 95% confidence interval based on the regression results (Figure 1). It illustrates the estimated coefficients of the treatment effect in different periods before and after accreditation, with a 95% confidence interval represented by the dashed error bars around each point. The x-axis is divided into periods labeled from "pre3" to "post3," where "pre" represents years before the accreditation and "post" represents years after the accreditation, with "current" denoting the year in which the education reform was implemented.

The parallel trend test plot in Figure 1 demonstrates that the coefficient is not significant when $t < 0$. These results indicate that, prior to international accreditation, there was no significant difference in the internship performance between the treatment group and control group. The parallel trend test shows that did_{it} coefficient for students enrolled after accreditation becomes statistically significant at the 1% level. Starting from the internship of senior students in 2020, the estimated coefficient becomes statistically significant at the 1% level, suggesting that international accreditation-driven reforms are associated with improved internship performance and may exhibit cumulative effects over time. A plausible explanation is that, since 2017, the Department of International Economics and Trade has implemented a series of educational reforms aligned with IACBE professional accreditation standards, including optimizing outcome-based teaching objectives, enhancing teaching methods, refining evaluation systems, improving faculty teaching skills, and integrating teaching resources. Collectively, these initiatives contributed to a more structured and supportive learning framework—characterized by clearer outcome-based objectives, improved teaching practices, and strengthened mentoring and feedback arrangements, which may facilitate students' translation of learning into internship performance. Students who enrolled in 2017 and participated in internships in 2021 benefited from 4 years of this holistic learning system, which may help explain their higher internship performance.

3.3 Placebo test

To make the results more robust, a placebo test is carried out. Non-repeated random sampling was conducted for 190 students and policy time in the sample. A total of 190 students were selected each time as the virtual treatment group and its corresponding random policy time point, and the remaining students were taken as the virtual control group. This process was repeated 500 times to obtain 500 estimated coefficients of $new_treat_{it} \times new_policy_{it}$. The cumulative distribution of coefficients are shown in Figure 2. The estimated coefficients based on random sample regression are distributed around 0, completely independent of the benchmark regression coefficient (0.07), most experiments have p-values more significant than 0.1, indicating that the observed association is unlikely to be driven by random assignment. In summary, the association between international accreditation and internship performance appears stable across specifications.

3.4 Robustness test

3.4.1 Excluding data for 2020

Due to the widespread disruptions caused by the COVID-19 pandemic (Xu and Yang, 2025), particularly in higher education, the year 2020 represents a unique period marked by the abrupt shift to online teaching, limitations on in-person internships, and institutional adjustments in assessment and supervision practices. To ensure that the conclusions of the empirical analysis are not influenced by the effects of the pandemic, the regression results after excluding the samples from 2020 are given in this study (Table 3, column 1), and the results have no significant changes. This indicates that the findings are not significantly influenced by the anomalies such as online teaching in the pandemic year. By excluding this outlier year, the study ensures that the conclusions are based on more consistent and stable data, thereby strengthening the overall validity and generalizability of the findings.

3.4.2 Replacement model

In order to reduce the error of regression results caused by sample self-selection, this study used the propensity score matching multiple difference method (PSM-DID) to further examine the association between accreditation and internship performance. The logit model is used to calculate the tendency score of each student. The nearest neighbor matching method is used, that is, to find the individuals with similar characteristics to the experimental group in the control group (Cao et al., 2021). Subsequently, balance and common support tests are performed to ensure the validity of the matching process, and any observations falling outside the common support region are excluded. The matched sample data are then subjected to DID regression analysis (Du et al., 2023). The results are presented in Table 3, column 2. The core explanatory variables are significant at the 1% levels, and the estimation coefficient is positive, confirming that the association

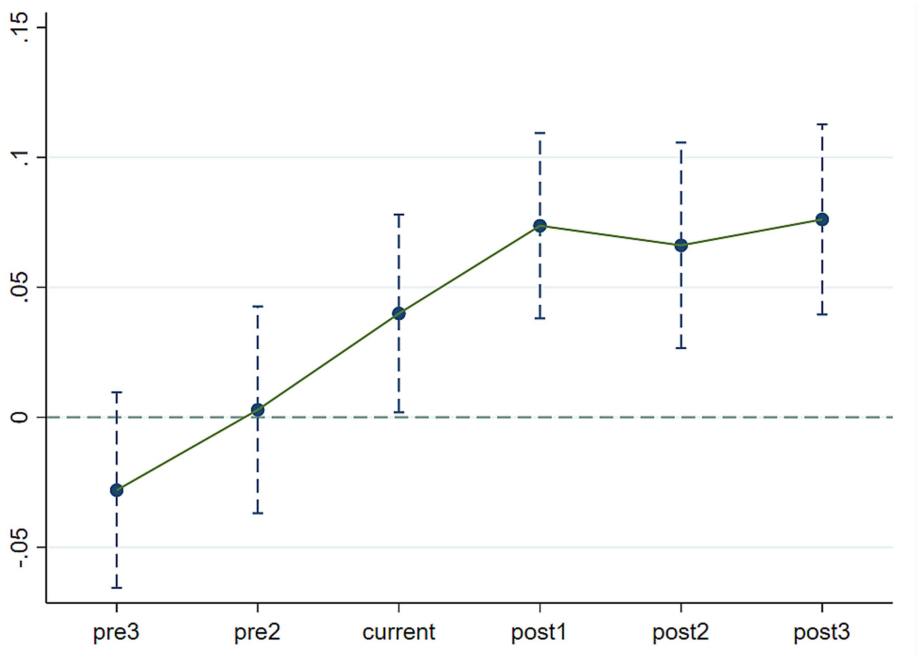

FIGURE 1
Parallel trend test.

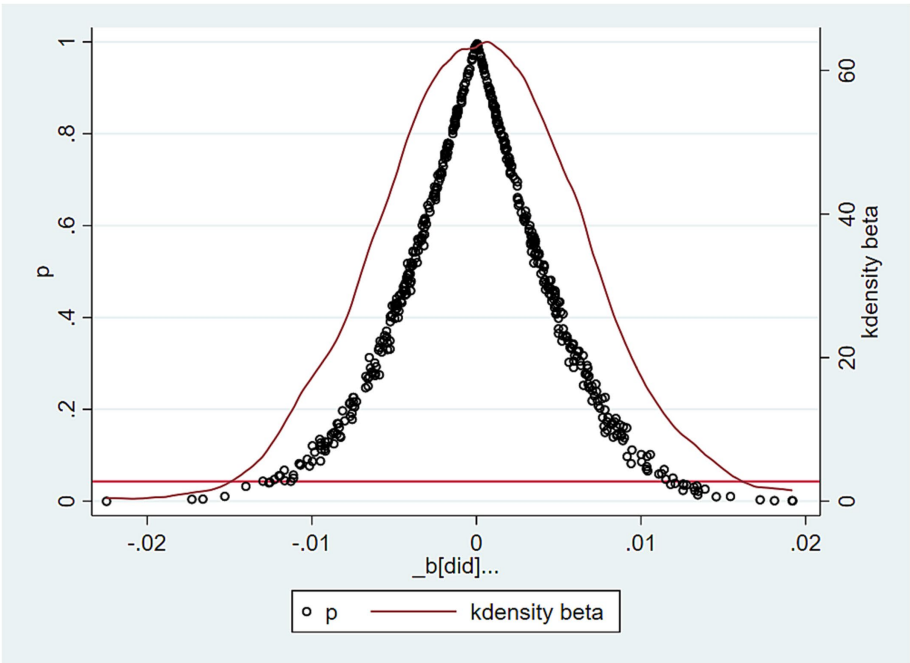

FIGURE 2
Placebo test.

between international accreditation and internship performance is robust to alternative model specifications. This also proves that the results of the previous estimation are robust.

3.4.3 Alternative measure of internship performance

To address concerns regarding the use of the entropy method for aggregating Likert-scale items, we conduct an additional robustness check by reconstructing the internship performance indicator using a simple unweighted average of all evaluation items. Simple averaging is widely adopted in educational and psychological research and provides a transparent benchmark. Re-estimating the baseline models with this alternative measure yields results that are consistent in direction and statistical significance with the benchmark findings. This indicates that the estimated association between international accreditation and students' internship performance does not depend on the specific weighting scheme employed.

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TABLE 3 Robustness tests.

Variable	(1) Score	(2) Score
did	0.0805***	0.0723***
	(0.012)	(0.010)
Constant	−1.0477***	−0.9299***
	(0.227)	(0.207)
Year fixed effects	Yes	Yes
Individual fixed effects	Yes	Yes
Control variable	Yes	Yes
Observations	1,826	2,487
R-squared	0.346	0.311

*** indicate significance level of 1%. Robust standard errors in parentheses.

4 Heterogeneity test

4.1 Heterogeneity in industry

To examine whether the association between international accreditation and internship performance varies across internship industries (Tommy, 2013; Jung and Lee, 2016), students' internship placements were categorized into technology, manufacturing, trade and logistics, finance and insurance services, education and healthcare, and other industries. The results are shown in columns 1 to 6 of Table 4. The findings indicate that the association between accreditation-driven reforms and supervisor-evaluated internship performance is statistically significant in finance and insurance services, trade and logistics, manufacturing, and technology sectors, whereas no statistically significant association is observed in education and healthcare placements. These differences may reflect variation in sector-specific evaluation norms, supervisory expectations, task structures, or the degree of alignment between curriculum arrangements and workplace assessment criteria. For example, accreditation-driven reforms emphasized outcome-based objectives, analytical reasoning, and structured evaluation practices, which may be more closely aligned with the performance dimensions commonly assessed in finance, trade, manufacturing, and technology contexts. In contrast, industries such as education and healthcare may place greater emphasis on context-dependent interpersonal or service-oriented dimensions that are less directly captured by the structured internship evaluation framework used in this study. Therefore, the observed heterogeneity should not be interpreted as definitive evidence of differential reform effectiveness across industries. Rather, it reflects context-specific patterns within internship evaluation settings, where institutional reforms and workplace assessment practices may interact differently across sectors.

4.2 Heterogeneity in gender

Following Campbell et al. (2013), students were categorized into female and male interns. The results of group regression shown in columns 7 and 8 of Table 4, indicate that the association between accreditation exposure and supervisor-evaluated internship performance is statistically significant among female students, while the corresponding coefficient for male students is comparatively smaller and less precisely estimated. Several factors may contribute to this observed difference. Variations in supervisory evaluation standards, role assignments during internships, or patterns of workplace interaction could influence how performance is assessed across gender groups. In addition, accreditation-driven reforms placed greater emphasis on structured learning objectives, collaborative learning arrangements, mentoring, and feedback mechanisms. Such structured supports may facilitate the alignment between classroom preparation and internship evaluation criteria and may interact differently with students' engagement patterns in internship settings. As a result, differences across gender groups could reflect variation in how students engage with or navigate these structured learning and evaluation environments.

5 Conclusions and recommendations

5.1 Conclusion

This study employs the DID method to examine the association between international accreditation and students' internship performance. Using supervisor- or employer-rated internship evaluations from 2017 to 2023, the results indicate that accreditation-driven educational reforms are associated with higher internship performance. The results suggest a pattern of sustained performance differences over time, which may reflect cumulative exposure to the reformed instructional and evaluation arrangements.

The findings suggest that international accreditation may function as a catalyst for institutional adjustment rather than merely a reputational signal. Through clearer learning objectives, stronger curriculum alignment, and more systematic evaluation practices, accreditation-driven reforms are associated with improved internship performance within the observed institutional framework. The timing of the estimated effects further suggests that sustained implementation and full exposure across students' training cycles may be important in shaping internship outcomes. Internship performance in this study reflects observable workplace behaviors and applied competencies assessed during a single internship episode and should be interpreted as a context-bound outcome rather than a comprehensive measure of broader employability.

Heterogeneity analysis indicates that the association between accreditation exposure and internship performance differs across student groups and internship contexts. Variation by industry and gender suggest that observed performance differences are shaped by contextual factors within internship evaluation settings. Industry-specific results show statistically significant associations in sectors such as finance, trade, manufacturing, and technology, whereas no significant associations are detected in education and healthcare placements. Similarly, differences across gender groups indicate heterogeneous patterns in supervisor-evaluated internship performance. These findings should be interpreted cautiously, as the study does not directly examine the mechanisms underlying industry or gender differences. Rather than demonstrating differential reform effectiveness, the results reflect context-specific patterns within structured internship evaluation environments.

The innovation of this research lies in three aspects. First, it provides empirical evidence from China, where studies examining the association between international accreditation and student-level outcomes remain limited. By treating IACBE accreditation as

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TABLE 4 Heterogeneity analysis by internship industry and gender.

Variable	(1) Technology Score	(2) Trade and Logistics Score	(3) Finance and Insurance Score	(4) Manufacturing Score	(5) Education and Healthcare Score	(6) Other Industries Score	(7) Female Score	(8) Male Score
did	0.064*	0.087**	0.190**	0.096***	0.086	0.043	0.070***	0.062*
	(0.034)	(0.034)	(0.079)	(0.028)	(0.061)	(0.027)	(0.012)	(0.032)
Constant	−0.973	−2.411***	−3.468**	0.089	−11.074**	−1.263**	−1.049***	−0.647
	(0.813)	(0.764)	(1.555)	(0.507)	(4.262)	(0.617)	(0.275)	(0.516)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	304	231	68	588	28	478	1,870	495
R-squared	0.573	0.653	0.715	0.512	0.940	0.529	0.362	0.501

*, **, and *** indicate significance levels of 10, 5, and 1%. Robust standard errors in parentheses. Internship industries are classified into technology, trade and logistics, finance and insurance, manufacturing, education and healthcare, and other industries based on the primary business activity of the internship employer. Columns (7, 8) report gender-specific estimates.

an institutional policy intervention within a quasi-experimental framework, this study integrates entropy and DID methods to estimate program-level associations, thereby offering a methodologically robust contribution to higher education research. Second, it extends the analytical lens of accreditation research from institutional or reputational dimensions to student-level internship performance, illustrating how accreditation-driven reforms are associated with measurable differences in internship performance. Third, the study further contributes by identifying heterogeneity in the observed associations across internship industries and gender groups, showing that accreditation exposure interacts with sectoral contexts and student characteristics within structured internship evaluation environments.

This study has several limitations. First, although mentoring, feedback practices, and reflective learning are discussed as potential explanatory pathways, they are not statistically tested as mediating mechanisms. Instead, these elements are conceptualized as part of the broader educational context through which accreditation-driven reforms may be associated with changes in internship performance. Second, the empirical analysis is based on data from a single university in China, which may limit the external validity and generalizability of the findings. Future research could address these limitations by employing causal mediation analysis and using multi-institutional or cross-regional data to further examine underlying mechanisms and broader applicability.

5.2 Recommendations

Based on the findings of the empirical study, the following recommendations are proposed:

For higher education institutions, the findings suggest that accreditation-driven reforms may be associated with improvements in structured internship performance, particularly when reforms are sustained and coherently implemented. As internships represent a core form of work-integrated learning, institutions should prioritize curriculum alignment, transparent learning objectives, and systematic evaluation arrangements that support structured internship preparation. Rather than viewing accreditation as a one-time certification process, universities should treat it as an ongoing framework for instructional reflection and assessment refinement. Faculty collaboration, peer review of teaching practices, and alignment between coursework and internship expectations can help ensure consistency between academic preparation and workplace evaluation standards (Wanangwa, 2024; Wrobel et al., 2026). Investments in digital infrastructure, faculty development, and learning analytics may further support more coherent instructional and assessment processes (Mwila, 2024; Seyoum et al., 2024). Given the observed heterogeneity across industries and gender groups, institutions should also remain attentive to context-specific differences in internship evaluation environments (Monteiro et al., 2016). Structured mentoring, feedback mechanisms, and role clarity during placements may help reduce variation arising from misalignment between academic preparation and workplace assessment practices. Such structured support may also contribute to the development of transferable competencies valued in early career contexts (Ramírez-Montoya et al., 2025).

With respect to accrediting bodies, accreditation frameworks should continue to emphasize clarity in learning outcomes, alignment between curriculum structures and experiential components, and structured documentation of internship evaluation processes. At the same time, accreditation standards may benefit from allowing flexibility across disciplinary and sectoral contexts, recognizing that internship evaluation practices vary by industry (Malau-Aduli et al., 2020). Encouraging dialogue between institutions and employers can help improve coherence between accreditation expectations and workplace assessment realities, without imposing overly standardized models across diverse sectors.

From a policy perspective, the integration of data analysis and digital literacy into the curriculum remains important in light of broader labor market dynamics. Although employment potential is a broad concept encompassing future employability and labor market readiness, prior research suggests that internship performance can function as an observable and early indicator associated with post-graduation employment trajectories. Internship evaluations capture students' applied skills, professional behavior, and adaptability in real work settings, and have been linked in prior studies to subsequent employability and early career development (Jackson, 2015; Silva et al., 2018). In this context, policymakers may support institutional efforts to strengthen structured internship preparation, supervision, and evaluation systems, including transparent monitoring mechanisms and industry–university collaboration. Encouraging the use of data analysis tools and digital platforms throughout coursework may further enhance alignment between academic preparation and workplace performance expectations (Zheng et al., 2024). Importantly, given that the present study focuses on supervisor-evaluated internship performance within a single institutional setting, broader conclusions regarding long-term employment outcomes require further longitudinal and multi-institutional investigation.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the studies involving humans because in this study, questionnaires were distributed to internship supervisors of senior students. The research on participants' evaluations of interns' performance was submitted to Guangzhou City University of Technology, China. The questionnaire introduction outlined the research purpose, social value, potential privacy risks, and data usage for educational research. It also included the research institution's name and contact details. By reading the introduction and completing the survey, participants were deemed to have provided informed consent. Given the low ethical risk, the study was approved by Guangzhou City University of Technology without requiring further ethical review. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

CX: Data curation, Methodology, Writing – original draft. YD: Formal analysis, Writing – original draft, Investigation. YT: Validation, Conceptualization, Writing – review & editing. XC: Funding acquisition, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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