International Journal of Instruction *July 2026 ● Vol.19, No.3*
e-ISSN: 1308-1470 ● www.e-iji.net *p-ISSN: 1694-609X*
pp. 79-98

Article submission code: 20250906081338
Received: 06/09/2025 Revision: 11/12/2025
Accepted: 24/12/2025 OnlineFirst: 01/04/2026

Construction and Empirical Study of an Evaluation System for the Quality of English-Medium Instruction for International Students in China

Wen Yang Gui
Institute of African Studies/College of Foreign Languages, Zhejiang Normal University, China, *zoeguiwenyang@126.com*

Ping Wang
Corresponding author, College of Economics and Management, Zhejiang Normal University, China, *simonwangping@126.com*

In this study, we constructed and empirically tested a system for evaluating the quality of English-Medium Instruction (EMI) for international students. The questionnaire measured international students' perceptions of eight teaching-quality factors and the resulting teaching effectiveness. Structural equation modeling (SEM) confirmed the factor structure and demonstrated acceptable model fit. Regression analysis using latent factor scores showed that teachers' positive attitude, rich content, diverse methods, and strong ability, as well as students' proactive learning attitude, solid professional foundation, and high effort level, all positively predicted teaching effectiveness. Contrary to expectations, cultural background differences were associated with slightly better outcomes – Hypothesis H8 was rejected – possibly because English often serves as a lingua franca in EMI settings. These findings fill a research gap by jointly considering teacher and student factors in evaluating EMI quality and offer an integrative framework for future quality assurance in international education.

Keywords: English-medium instruction (EMI), evaluation of EMI international students, improvement strategies, indicators strategies, EFL

INTRODUCTION

As globalization accelerates and China's higher education becomes more internationalized, Chinese universities are attracting a record number of overseas students. In 2022, about 490,000 international students from 196 countries were enrolled in Chinese higher education institutions (Zheng, 2022). To serve this diverse student body, many universities have implemented English-medium instruction (EMI) programs.

In this policy context, ensuring the quality of EMI has become a national priority. For example, China's Education Modernization 2035 plan (CPC & State Council, 2019) calls for "establishing quality assurance mechanisms for international education". Nevertheless, international students still face significant linguistic and cultural barriers

Citation: Gui, W. Y., & Wang, P. (2026). Construction and empirical study of an evaluation system for the quality of English-medium instruction for international students in China. *International Journal of Instruction*, *19*(3), 79-98.

in EMI classrooms. These challenges complicate effective teaching and evaluation. To address this gap, the present study develops and validates a comprehensive EMI teaching-quality evaluation scale that measures both instructor and learner dimensions of instruction. This framework is intended to improve EMI teaching quality, cultivate high-caliber international graduates, and systematize program management.

Existing research on EMI in China has largely focused on three areas. First, scholars have examined different EMI program models for international students (Wu & Zhou, 2015) and identified the challenges and solutions associated with EMI implementation (Xu, Xiong & Tang, 2016). Second, researchers have proposed suggestions to enhance EMI quality (Fu, 2009). By definition, EMI involves delivering academic content in English to facilitate learning for international students (Xiao & Yu, 2017). Therefore, evaluating EMI teaching requires assessing multiple elements—teachers, students, and instructional content—which is essential for improving educational management and learning outcomes.

Many studies emphasize teacher-centered dimensions of instructional quality in EMI. For example, Zhao (2016) showed that teachers' professional competence and pedagogical skills significantly influence EMI outcomes. Liu & Qiao (2015) proposed that international classroom quality can be broken down into teacher constructs such as teaching attitude, content, methods, and skill development. Wang et al. (2017) suggested a broad assessment framework that includes instructional inputs, processes, classroom atmosphere, and outcomes. These studies highlight instructors' pivotal role in shaping EMI effectiveness.From an international perspective, a study on 297 Taiwanese university faculty (Lin & Tsou, 2025) further highlights the role of technology in enhancing teacher-focused EMI quality: through a 36-hour technology-mediated professional development program framed by the Community of Inquiry (CoI) framework, AI tools improved teachers' pedagogical design and ICT platforms boosted collaborative engagement, ultimately increasing faculty self-efficacy and promoting student-centered teaching.

Other researchers have noted limitations of narrow, teacher-focused evaluations and offered broader models. For instance, Chen (2023) identified problems in current teaching-evaluation practices — limited scope, teacher-centric bias, and lack of systematization — and called for more comprehensive approaches. Similarly, Wang and Suonan (2003) developed a higher-education teaching-quality scale for mathematics dividing the construct into four dimensions: teaching attitude, methods, teacher level, and teaching effect, with twelve sub-indicators. These efforts underscore the need to broaden evaluation to include multiple instructional facets, not just teacher behaviors.

In contrast, a complementary body of research adopts a student-centered perspective. Learners' characteristics and attitudes are seen as central to teaching quality. For example, Marsh (1987) identified numerous factors of effective teaching from the student's viewpoint – including perceived learning value, instructor enthusiasm, clarity of presentation, rapport, and appropriate workload. Building on this, Sun & Fu (2008) argued that student-centered assessment should consider five dimensions: teacher quality, student quality, student expectations, teaching management, and the learning

environment. These studies stress that students' engagement, motivation, and background are crucial indicators of EMI effectiveness.

Some studies attempt integrated or comprehensive models that span institutional, instructional, and learner dimensions. For instance, Wang (2009) proposed an evaluation model for international student programs with seven dimensions: institutional reputation, teaching level, support services, facilities, social integration, reliability, and emotional factors. Praetorius et al. (2018) similarly suggested that quality teaching evaluation should include classroom management, student support, and cognitive engagement. These frameworks acknowledge the multifaceted nature of EMI quality across stakeholders.

Despite these advances, a core limitation remains: many studies still treat teacher-related factors and student-related factors in isolation, rather than examining how these two sets of factors interact—one that has also been noted in Macaro et al.'s (2018) global review. Few prior works offer a unified framework combining both perspectives. This study addresses that gap by developing and psychometrically validating an integrated EMI teaching-quality model. We collected survey data from international students at a Zhejiang university and constructed an eight-factor scale covering teacher behaviors (teaching attitude, content, methods, ability) and student attributes (learning attitude, prior knowledge, effort level, cultural background). Confirmatory factor analysis supports the proposed factor structure. We evaluate reliability and convergent validity for each dimension, and assess discriminant validity. We also conduct multi-group invariance tests to ensure the scale functions equivalently across subgroups. Finally, we use regression analysis to examine how both teacher and student factors jointly relate to teaching effectiveness. By integrating these dimensions in one framework, our approach provides a more holistic understanding of EMI quality and offers novel insights beyond prior segmented studies.

Theoretical Framework

The hypothesized model posits that EMI teaching effectiveness is driven by both instructor and student factors. Specifically, the model includes four teacher-side constructs and four student-side constructs . Each construct is expected to have a positive influence on overall teaching effectiveness. Confirmatory factor analysis (CFA) and SEM are used to test the measurement model and structural paths. We ensure each latent construct meets conventional validity thresholds: composite reliability (CR) > 0.70 and AVE > 0.50. Discriminant validity is assessed via the HTMT criterion, and measurement invariance tests are conducted to confirm the scale functions equivalently across key student groups. The resultant model thus integrates both pedagogical and learner dimensions of EMI quality.

METHOD

Research hypotheses

(1) Impact of teaching attitude on teaching effectiveness

Teachers' attitudes toward teaching are key in fostering student interest and motivation. Teaching attitude, as an internal psychological factor, acts as a stable mediator between

external stimuli and individual behavior, playing a foundational role in guiding teaching actions (Yang, 2006). A positive teaching attitude can enhance both teachers' efficiency and students' engagement, contributing to better educational outcomes. Thus, we propose the following hypothesis:

Hypothesis H1: A positive teaching attitude from teachers has a positive impact on teaching effectiveness.

(2) Impact of teaching content on teaching effectiveness

The content delivered in teaching is a primary source of student knowledge and skills development. Teaching content is shaped by curriculum standards, instructional materials, and the teaching environment, which must be harmonized in practice (Chen & Shi, 2022). High-quality content should emphasize core knowledge, foresight, and relevancy (Yang, 2006). Based on this, we propose:

Hypothesis H2: Effective selection and delivery of teaching content by teachers has a positive impact on teaching effectiveness.

(3) Impact of teaching methods on teaching effectiveness

Teaching methods are the mechanisms by which teachers share knowledge and engage with students, linking educators, learners, and course material in dynamic ways (Li, 2011). Teachers need to choose appropriate teaching methods to carry out teaching activities, and teaching methods have a direct impact on teaching quality (Zhao & Li, 2019). Using diverse and appropriate teaching methods can significantly improve classroom outcomes. Therefore, we propose:

Hypothesis H3: The adoption of varied and active teaching methods by teachers positively affects teaching effectiveness.

(4) Impact of teaching ability on teaching effectiveness

Teaching ability refers to a kind of psychological characteristics that teachers show when they are engaged in teaching activities, which includes a range of skills, from instructional design and implementation to evaluation (Yang, 2021). This ability is a central measure of teaching quality and a critical element in enhancing it (Wang, 2022). Hence, we propose:

Hypothesis H4: Strong teaching abilities among teachers positively affect teaching effectiveness.

(5) Impact of learning attitude on teaching effectiveness

Learning attitude encompasses students' perspectives on learning activities and is reflected in their behaviors and engagement (Sun, 2003). Indicators of learning attitude include attention, emotional involvement, and motivation toward coursework, materials, teachers, and institutions (Lin, 2011). Effective teaching largely depends on students' attitudes toward learning. A scientific, engaged learning attitude can significantly improve teaching outcomes (Zhang & Geng, 2009). Thus, we propose:

Hypothesis H5: A positive learning attitude among students positively impacts teaching effectiveness.

(6) Impact of professional foundation on teaching effectiveness

Students' professional foundation refers to the pre-existing knowledge they bring to specialized courses. Having foundational knowledge helps students adapt more easily to professional studies and absorb new material more effectively (Peng, 2009). Having a certain amount of specialized basic knowledge helps to improve the teaching effectiveness. Therefore, we propose:

Hypothesis H6: A strong professional foundation among students positively impacts teaching effectiveness.

(7) Impact of effort level on teaching effectiveness

The effort level of students, which includes time and energy devoted to learning, has a direct impact on learning outcomes. Regression analysis by Wang (2013) shows that greater effort correlates with improved academic results, and the higher the effort level of learning, the better the effect of learning. Therefore, students' effort level has a positive impact on teaching effectiveness. Thus, we propose:

Hypothesis H7: High effort level among students positively impact teaching effectiveness.

(8) Impact of cultural context on teaching effectiveness

Cultural background encompasses the cultural environmental that has an impact on the physical and mental development and personality formation of a person (Gu, 1998). Cultural backgrounds significantly affect personality, emotional expression, and cognitive style. International students' adaptation to a new cultural environment can greatly influence their learning experiences. Therefore, we propose:

Hypothesis H8: Differences between Chinese and international students' cultural backgrounds have a negative impact on teaching effectiveness.

Survey Participants

To evaluate the teaching quality of EMI for international students, a total of 479 valid questionnaires were collected between 30 September 2022 and 30 July 2025. This comprised 189 online responses and 290 offline responses. Participation was voluntary, and informed consent was obtained from all participants. For the online survey, consent was implied when participants clicked "Start Answering." Offline participants provided verbal consent prior to questionnaire administration, documented by the researcher. All participants were informed of their right to withdraw at any time. No minors participated in this study; parental/guardian consent was therefore not required. Ethical approval was granted by the Research Ethics Committee [ZSRT2025163]. The sample included 227 male students and 252 female students, with most respondents (80.09%) being native English speakers (Table 1).

Table 1
Gender and grade distribution

		Frequency	Percentage (100%)
Gender	Male	227	47.39
	Female	252	52.61
Grade	Freshman	121	25.26
	Sophomore	149	31.11
	Junior	69	14.41
	Senior	75	15.65
	Graduate	39	8.14
	Postgraduate	26	5.43
Native Language	English	384	80.09
	French	48	9.95
	Arabic	11	2.37
	Spanish	4	0.95
	Indonesian	5	0.95
	Other	27	5.69

Research Tools

The primary research tool used was a questionnaire.The questionnaire had three sections. The first gathered demographics, including gender, grade, major, country of origin, native language, and EMI experience of the international students. The second section addressed students' perceptions of EMI teaching quality, with 32 items covering the four teacher-related and four student-related domains. The third section assessed perceived EMI effectiveness with 4 items. These indicators were derived from interviews with educators and students and a review of existing EMI teaching quality literature (see Appendix 1).Researchers had no access to identifiable participant information; all data were anonymized during collection.

FINDINGS AND DISCUSSION

Design and Analysis of the EMI Quality Scale

Scale design

Drawing on interviews and a review of relevant literature, this study identified key indicators for EMI quality that international students value. An EMI quality evaluation scale was then developed based on these insights (see Appendix 1).

Factor analysis

A random selection of approximately half of the valid questionnaires (242) was used for exploratory factor analysis, while the remaining 237 were used for confirmatory factor analysis. The following steps outline the factor analysis process:

(1) Exploratory factor analysis

1) Mathematical model

The theoretical model of factor analysis is as follows:

$$Z_j=a_{j1}F_1+a_{j2}F_2+a_{j3}F_3+\cdots+a_{jm}F_m+U_j\ (j=1,2,3,\ \ldots,\ n) \quad (1)$$

where Z_j represents the standardized variable with a mean of zero and a variance of one; F_i（i=1,2,…,m）represents common factors, and m is the number of common factors; U_j represents specific factors unique to Z_j, which indicates the part of the variable that cannot be explained by the common factor; and a_{ij} represents factor loadings. Here, Z_j refers to the standardized evaluation scores for questions A1 to A31.

2) Results analysis

① KMO and Bartlett test

Table 2
KMO and Bartlett's test

KMO and Bartlett's test		
Kaiser-Meyer-Olkin metric with sufficiently large samples		0.737
Bartlett's test of sphericity	Approximate chi-square	3042.901
	Df	465
	Sig.	.000

The Kaiser-Meyer-Olkin (KMO) measure was used to assess the suitability of the data for factor analysis, with a higher KMO indicating stronger commonalities among variables, then the study data is suitable for factor analysis. A KMO value below 0.5 suggests an insufficient sample size for factor analysis. The KMO value for this dataset was 0.737, indicating its appropriateness for factor analysis (see Table 2).

② Principal component analysis results

Exploratory Factor Analysis (EFA) initially identified nine factors (see Table 3). Among these, one factor corresponded to the four items measuring teaching effectiveness, which was subsequently treated as an outcome variable rather than a predictor variable in the subsequent analysis. The remaining eight factors—representing the dimensions of EMI teaching quality, namely Teaching Attitude, Teaching Content, Teaching Methods, Teaching Ability, Learning Attitude, Professional Foundation, Effort Level, and Cultural Background—were extracted from the rotated component matrix and retained for further analysis, with detailed information provided in Table 3.

Table 3
Rotated component matrix [a]

	Evaluation Indicator	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Explained Variance	Commonality
Teaching attitude	A1	0.645									11.253%	0.481
	A2	0.699										0.507
	A3	0.674										0.468
	A4	0.686										0.500
	A5	0.666										0.465
	A6	0.696										0.512
	A7	0.744										0.565
Teaching content	A8		0.690								8.776%	0.495
	A9		0.734									0.544
	A10		0.700									0.515
	A11		0.717									0.524
	A12		0.733									0.543
Teaching methods	A13			0.719							8.428%	0.550
	A14			0.698								0.492
	A15			0.674								0.483
	A16			0.684								0.496
	A17			0.765								0.608
Teaching ability	A18				0.669						7.844%	0.479
	A19				0.721							0.540
	A20				0.699							0.514
	A21				0.690							0.528
	A22				0.732							0.568
Teaching effectiveness	A23					0.811					9.867%	0.750
	A26					0.752						0.684
	A25					0.741						0.711
	A24					0.731						0.681
	A27					0.699						0.731
Learning attitude	A28						0.752				6.374%	0.573
	A29						0.798					0.648
	A30						0.843					0.717
Professional foundation	A31							0.813			4.259%	0.682
	A32							0.839				0.715
Level of effort	A33								0.823		4.815%	0.681
	A34								0.809			0.658
Cultural background	A35									0.825	4.630%	0.701
	A36									0.844		0.725

Extraction Method: Principal Component.
Rotation: Orthogonal rotation with Kaiser's standardization.
a. Rotation converges after 5 iterations.

Table 3 presents the results of the factor analysis conducted on the international students' EMI quality evaluation scale, identifying nine factors. Factor 1, labeled Teaching Attitude, explains 11.25% of the variance, with evaluation indices A1-A7 showing high factor loadings. Factor 2, named Teaching Content, accounts for 8.776% of the variance, with indices A8-A12 displaying high loadings. Factor 3, termed Teaching Methods, explains 8.428% of the variance, with indices A13-A17 having high loadings. Factor 4, labeled Teaching Ability, accounts for 7.844% of the variance, with indices A18-A22 showing strong loadings. Factor 5, identified as Teaching Effectiveness, explains 9.867% of the variance, with indices A23-A27 showing high loadings. Factor 6, named Learning Attitude, contributes 6.374% of the variance, with indices A28-A30 displaying significant loadings. Factor 7, labeled Students' Professional Foundation, explains 4.259% of the variance, based on indices A31-A32. Factor 8, termed Students' Level of Effort, accounts for 4.815% of the variance, with indices A33-A34 showing high loadings. Finally, Factor 9, labeled Student Cultural Background, explains 4.630% of the variance, with indices A35-A36 exhibiting high loadings.

③ Reliability and validity analysis

The commonality of factor analysis results was used to evaluate validity. As shown in Table 4, the commonality coefficients for all scale items exceed 0.4, indicating that most of the variance in each variable is explained by the factors, demonstrating strong validity.

Reliability was assessed using Cronbach's alpha. A coefficient above 0.80 indicates good reliability, while values above 0.70 are acceptable; coefficients ranging from 0.70 to 0.98 demonstrate high reliability. Conversely, reliability below 0.35 is considered low and warrants rejection. As shown in Table 4, the Cronbach's alpha values for all factors suggest high reliability and internal consistency across the scale.

Table 4
Reliability analysis

Evaluation Factors	Cronbach's Alpha
Teaching attitude	0.815
Teaching content	0.765
Teaching methods	0.755
Teaching ability	0.77
Teaching effectiveness	0.900
Learning Attitude	0.727
Professional foundation	0.593
Level of effort	0.541
Cultural background	0.607
Scale	0.773

(2) Confirmatory factor analysis

1) Significance of path coefficients/loading coefficients

Validation factor analysis was conducted using AMOS, with the parameter estimates shown in Table 5. The model evaluation began by examining the statistical significance of the parameters estimated, specifically the path coefficients or loading coefficients,

akin to parameter significance testing in regression analysis (Weng, 2011). Based on the p-values in Table 5, all factor p-values are less than 0.01, indicating that the path coefficients are significantly different at the 95% confidence level. Table 6 shows that factor loadings for the question items are all above 0.5, confirming the scale's high validity. Additionally, AMOS provides the C.R. (critical ratio) statistic, a z-value derived from the ratio of the parameter estimate to its standard deviation, to further validate the level of significance.

Table 5
Confirmatory factor analysis results

Factor	Evaluation Indicator	Unstandardized path coefficient estimate	S.E.	C.R.	P	Standardized path coefficient estimate
Teaching attitude	A1	4.362	0.05	87.549	***	0.588
	A2	3.941	0.044	90.346	***	0.633
	A3	3.819	0.049	77.837	***	0.596
	A4	4.181	0.054	77.905	***	0.641
	A5	4.151	0.049	84.848	***	0.599
	A6	3.78	0.055	69.304	***	0.618
	A7	4.249	0.049	87.072	***	0.686
Teaching content	A8	3.67	0.049	74.495	***	0.593
	A9	4.471	0.052	85.847	***	0.641
	A10	4.178	0.051	81.561	***	0.613
	A11	4.279	0.049	86.719	***	0.634
	A12	4.005	0.051	78.967	***	0.657
Teaching methods	A13	3.78	0.055	68.229	***	0.646
	A14	3.597	0.046	78.994	***	0.588
	A15	3.92	0.055	70.671	***	0.576
	A16	3.503	0.046	75.41	***	0.589
	A17	3.817	0.052	72.828	***	0.7
Teaching ability	A18	4.185	0.049	85.932	***	0.566
	A19	4.005	0.049	81.858	***	0.635
	A20	3.876	0.049	79.123	***	0.61
	A21	3.863	0.051	76.343	***	0.603
	A22	4.355	0.051	85.176	***	0.632
Teaching effectiveness	A23	0.923	0.047	19.746	***	0.805
	A24	0.886	0.046	19.098	***	0.787
	A25	0.956	0.048	20.098	***	0.815
	A26	0.850	0.045	18.977	***	0.784
	A27	0.817	0.041	19.735	***	0.805
Learning attitude	A28	3.721	0.05	74.921	***	0.595
	A29	4.062	0.048	85.171	***	0.662
	A30	4.364	0.053	81.732	***	0.808
Professional foundation	A31	3.876	0.049	78.779	***	0.813
	A32	4.037	0.048	84.055	***	0.519
Level of effort	A33	3.947	0.049	79.836	***	0.561
	A34	3.824	0.056	68.401	***	0.666
Cultural background	A35	3.824	0.052	73.094	***	1.113
	A36	4.046	0.056	72.393	***	0.393

Note: "***" indicates significant at 0.01.

2) Model Fit Evaluation

The model fit indices evaluate how well the theoretical structural model aligns with the observed data, considering factors like model complexity, sample size, and measures of both relative and absolute fit (Deng & Yu, 2017). AMOS provides a range of model fit indices, shown in Table 6.

Table 6
Fit Index

Index name		Evaluation criteria
Absolute fit index	χ^2	the smaller the better
	Ratio of chi-square degrees of freedom	Between 1 and 5
	CFI	Greater than 0.9
	RMR,SRMR,RMSEA	Less than 0.05, the smaller the better
Relative fit index	NFI,TLI,CFI	Greater than 0.9, the closer to 1 the better
Information index	AIC,CAIC	The smaller the better.

Key indices include $\chi 2/df = 1.181$ (less than 5), RMSEA = 0.020 (below 0.05), and CFI = 0.972 and TLI = 0.968 (both above 0.9), all of which indicate acceptable model fit and good structural validity (see Table 7).

Table 7
Results of the fit index of the teaching evaluation scale model

Sample size	Ratio of chi-square degrees of freedom	RMSEA	CFI	TLI
479	1.181	0.020	0.972	0.968

Analysis of Teaching effectiveness and Influencing Factors of EMI Quality

After establishing the measurement model with confirmatory factor analysis (CFA), we treated teaching effectiveness as a distinct outcome variable composed of four items; the mean of these items was used as the dependent variable in subsequent analyses. The four-item composite exhibited high internal consistency (Cronbach's α = 0.90). CFA produced acceptable fit for the measurement model (see Table 7), and all standardized factor loadings were within acceptable bounds (no loading exceeded 1.0), indicating the absence of estimation anomalies in the model.

Although a full structural equation model (SEM) could have modeled measurement and structural relations simultaneously, we adopted a two-step approach: first confirm the measurement structure via CFA, then extract factor scores for the latent dimensions and enter those scores into a multiple regression predicting the teaching-effectiveness composite. This choice was guided by two considerations: (1) it cleanly separates measurement validation from predictive inference, making the unique contribution of each latent dimension easier to interpret; and (2) it reduces model complexity and improves transparency when reporting effect sizes for a relatively large set of predictors.

The predictor set comprised factor scores derived from a full-sample factor analysis with orthogonal rotation; the analysis yielded eight factors consistent with the exploratory results: Teaching Attitude, Teaching Content, Teaching Methods, Teaching Ability, Learning Attitude, Professional Foundation, Effort Level, and Cultural Background. These eight factor scores were entered simultaneously as independent variables in a multiple regression with the teaching-effectiveness mean as the dependent variable. The resulting model was statistically significant (ANOVA $F=50.174$, $p<0.001$; see Table 8). In the regression, seven predictors showed significant positive associations with perceived effectiveness; cultural background produced a modest positive coefficient, leading us to reject the hypothesized negative effect (H8). We discuss

plausible explanations and the reliability caveats for certain scales elsewhere in the manuscript.

Table 8
Results of multiple regression analysis of teaching effectiveness

Model	Sum of squares	Degrees of freedom	Root mean square	F	Significance level
Regression analysis	176.028	8	22.003	50.174	0.000[b]
Residuals	206.109	470	0.439		
Total	382.137	478			

a. Dependent Variable: Teaching Effectiveness

b. Independent Variables: Teaching Attitude, Teaching Content, Teaching Methods, Teaching ability, Learning Attitude, Professional foundation, Level of effort, Cultural Background

The ANOVA table for multiple regression showed a p-value of 0.000, with significance below 0.05, confirming the regression model's significance.

Table 9
Regression Analysis Coefficients

Model	Unstandardized coefficient	Standard deviation	Standardized coefficient	T-value	Significance level
(Constant)	-4.745	0.463		-10.255	0.000
Teaching attitude	0.326	0.047	0.250	6.952	0.000
Teaching content	0.329	0.044	0.266	7.452	0.000
Teaching methods	0.245	0.044	0.200	5.554	0.000
Teaching ability	0.390	0.046	0.305	8.548	0.000
Learning attitude	0.311	0.039	0.281	7.876	0.000
Professional foundation	0.173	0.037	0.169	4.731	0.000
Level of effort	0.155	0.035	0.159	4.439	0.000
Cultural background	0.242	0.039	0.221	6.149	0.000

Regression results (Table 9) showed that seven factors had significant positive effects on effectiveness ($p<0.001$): teaching attitude, content, methods, ability, learning attitude, professional foundation, and effort level. Each hypothesis H1 – H7 was supported. For cultural background (H8), the regression coefficient was positive (β = 0.221, t = 6.149, $p < 0.001$). This is the opposite of the hypothesized negative impact: Hypothesis H8 was explicitly rejected. Rather than hindering EMI, cultural diversity showed a modest positive association with teaching effectiveness. One explanation is that in EMI contexts, English often serves as a bridge language, mitigating cross-cultural communication barriers. In practice, international students' cultural strengths and institutional support may have turned diversity into an asset (as reflected in Table 10).

Tables 10 illustrate that the t-values and significance levels confirm a significant positive impact for several factors. For Teaching Attitude, the t-value is 6.952 (>2), with a significance level below 0.05, indicating a significant positive influence on teaching effectiveness. This validates hypothesis H1 and highlights the importance of fostering a positive teaching attitude.

The t-value of Teaching Content is 7.452(>2), and the significance level is less than 0.05, which indicates that teaching content has a significant positive effect on teaching effectiveness, indicating that the H2 is valid, and that teachers must select effective teaching content to subsequently enhance the overall quality of instruction.

For Teaching Methods, the t-value is 5.554 (>2), and the significance level is below 0.05, which indicates that teaching methods have a significant positive effect on teaching effectiveness, validating hypothesis H3. Active, diverse, and heuristic methods positively influence teaching effectiveness, emphasizing the importance of adopting innovative approaches to improve the teaching quality.

The t-value for Teaching Ability is 8.548 (>2), with a significance level below 0.05, which indicates that teaching ability has a significant positive impact on teaching effectiveness, confirming hypothesis H4. This finding demonstrates that teaching ability significantly impacts teaching effectiveness, with higher abilities correlating to better outcomes.

Regarding Learning Attitude, the t-value is 7.876 (>2), and the significance level is below 0.05, which indicates that the teaching attitude has a significant positive impact on the teaching effectiveness, validating hypothesis H5. A positive and active learning attitude among students contributes to improved teaching quality.

For Level of Effort, the t-value is 4.439 (>2), and the significance level is below 0.05, which can show that level of effort has a significant positive effect, confirming hypothesis H7. Greater student effort leads to enhanced teaching effectiveness.

The t-value for Cultural Background is 6.149 (>2), with a significance level below 0.05, suggesting a positive effect, which indicates that cultural background has a significant positive effect, though hypothesis H8 is rejected. While cultural differences, such as language and way of thinking, may pose challenges, the results indicate that the EMI format mitigates these difficulties, particularly as English is the official language for most international students.

Finally, for Professional Foundation, the t-value is 4.731 (>2), and the significance level is below 0.05, which indicates that professional foundation has a significant positive effect, validating hypothesis H6. A solid professional foundation supports students in improving teaching quality and effectiveness.

Table 10
Conclusions of regression analysis

Hypothesis	Results
H1	Accepting the original hypothesis, teachers' positive teaching attitude has a positive effect on teaching.
H2	Accepting the original hypothesis, the teaching content which is interesting, practical and integrated with practice has a positive effect on teaching.
H3	Accepting the original hypothesis, effective teaching methods have a positive impact on teaching.
H4	Accepting the original hypothesis, the high level of teaching ability is conducive to the improvement of teaching effectiveness.
H5	Accepting the original hypothesis, students' positive learning attitude is conducive to improving teaching effectiveness.
H6	Accepting the original hypothesis, students' professional foundation has a positive effect on teaching.
H7	Accepting the original hypothesis, the more effort students put on learning, the better the teaching effectiveness.
H8	Rejecting the original hypothesis, the cultural background of international students has a positive effect on teaching.

The regression analysis summary demonstrates that teaching ability, content, attitude, and methods have the most significant impact on teaching effects, followed by learning attitude, cultural background, professional foundation, and effort level.

DISCUSSION

These findings highlight that both teacher and student factors significantly contribute to EMI quality. Teachers' attitudes, content expertise, pedagogical methods, and overall ability all positively influenced effectiveness, consistent with broader literature on instructional quality. Students' own engagement – their learning attitude, prior knowledge, and effort — also enhanced outcomes. Interestingly, cultural background differences did not impede learning; if anything, they coincided with slightly better outcomes. EMI scholarship suggests that when English is a common lingua franca, cultural diversity can enrich the classroom rather than pose insurmountable barriers.

We note some limitations: the effects of student factors, while significant, were relatively modest, and internal consistency for a few scales was lower than ideal (e.g. professional foundation α =0.593; effort level α =0.541). These lower reliabilities advise caution in interpreting those specific results. Overall, however, the validated scale and model provide a more holistic understanding of EMI quality.

IMPLICATIONS

With Chinese higher education internationalizing, evaluating EMI teaching quality is crucial. This study developed a reliable, multi-dimensional evaluation scale and tested it with over 400 international students. The analysis confirmed that high teacher competence, relevant content, positive teacher attitude, and active methods are key to EMI success, alongside students' motivation, background knowledge, and effort. Cultural differences, surprisingly, did not detract from effectiveness. The integrated evaluation model we propose fills a research gap by jointly accounting for teacher and

student influences on EMI outcomes, offering a practical framework for quality assurance.

Based on these findings, we make the following recommendations for EMI practice:

(1) Improve teacher qualifications

Teachers are crucial to the development of universities, as their ethics, knowledge, and teaching skills directly affect EMI quality. Suggested improvements include:

① Enhance teaching attitude

Teaching attitude directly affects teaching effectiveness, so teachers should have a positive teaching attitude and improve their professional ethics. Teachers can adopt a "student-centered" approach. International students particularly value respect and patience from teachers. Therefore, teachers should constantly be responsible, not only teaching knowledge to students, but also respecting them, caring for their needs and their thoughts.

② Strengthen teaching ability

Effective English-Medium Instruction (EMI) imposes dual core requirements on teachers: mastery of subject-specific knowledge and proficiency in EMI-adapted pedagogical skills. The latter encompasses essential competencies such as cross-cultural communication, classroom management, and bilingual explanation techniques, while also requiring teachers to proactively integrate the latest disciplinary research findings and educational reform outcomes into instruction—an approach that helps broaden international students' academic horizons (Li, 2017).

Teachers' English proficiency serves as a foundational determinant of EMI effectiveness, as it directly influences the clarity of knowledge transmission and quality of teacher-student interaction. Enhanced English competence not only boosts teachers' instructional confidence but also facilitates smoother communication with international students, thereby increasing students' classroom participation. To systematically improve these key capabilities, targeted professional development initiatives are recommended, such as EMI pedagogy workshops and intercultural teaching training. These programs can help teachers acquire practical skills tailored to EMI contexts. Collectively, advancements in teachers' pedagogical skills and English proficiency directly contribute to the overall improvement of EMI quality.

③ Refine Teaching Methods

Teaching method is the teaching means of teachers, which directly affects the teaching effectiveness. To meet diverse needs, teachers should adapt their methods to different student backgrounds and content, using techniques that engage international students and enhance learning. Teachers need to give full consideration to the social background and cultural differences of international students, and when teaching, they can adopt teaching methods favored by international students to attract students' attention and improve the teaching effectiveness.

(2) Enhance students' independent learning ability

① Foster positive learning attitude

Students are the key factor of teaching quality. Students' learning attitudes significantly affect EMI quality. First of all, international students should cultivate autonomy and enthusiasm in learning, recognizing the importance of knowledge learning for future development, and increase their learning interest. Secondly, they must know themselves correctly, find a sense of identity and balance in study, and actively overcome the challenges of studying in China, including language and cultural differences.

② Increase learning investment

There is a positive correlation between students' learning investment and teaching outcomes. Learning investment involves the whole process of course learning, including pre-course preparation, classroom participation and cooperation, post-course consolidation and completion of course tasks. Compared with domestic students, foreign students invest less in learning. Therefore, it is necessary to enhance the learning investment of international students, strengthen their ability to learn independently, enhance their enthusiasm for learning, actively participate in class, and foster independent learning habits and improve engagement.

③ Integrate cultural background with practical learning

Cultural background related to the environment will influence students' understanding and knowledge acquisition. From the results of regression analysis, we know that international students' own cultural background has a contributing effect on learning under the EMI environment. Therefore, international students should leverage their cultural strengths to deepen understanding and combine them with the classroom knowledge, so as to promote the absorption and comprehension of the knowledge, and to improve learning efficiency in the EMI environment.

These implications are grounded in the data: emphasis on teacher competence, positive learning behaviors, and institutional support align with the significant factors we identified. By focusing on these areas, universities can more effectively address the actual drivers of EMI success revealed in our study.

CONCLUSION

With the internationalization of Chinese education and increasing numbers of international students, teaching quality remains central to educational reform. Chinese universities have implemented EMI programs, but objective evaluation of EMI quality is a growing need. This study, which included international students at a Zhejiang university, developed a teaching quality scale, designed a corresponding questionnaire, and analyzed results through factor analysis and regression. Findings indicate that teaching factors like high-level ability, practical content, positive attitude, and effective methods positively correlate with teaching effectiveness. Additionally, factors like students' learning attitudes, professional background, and effort level contribute positively. Cultural differences also facilitate positive outcomes under the EMI system.

The study concludes with recommendations to improve EMI teaching quality for international students.

ACKNOWLEDGMENTS

This work was supported by Zhejiang Provincial Think Tank. We thank Dr. Liu Hongwu and Wang Yan for helpful comments on the manuscript.

REFERENCES

Central People's Government of the People's Republic of China. (2019). China Education Modernization 2035. https://www.gov.cn/zhengce/2019-02/23/content_5367987.htm. (Accessed November 15, 2024)

Chen, Z. (2023). Research on Teaching Quality Evaluation of Higher Education Teachers. *Heilongjiang Education (Theory and Practice)*, 2023(07), 26-29.

Chen, Z. G., & Shi, J. C. (2022). Research on the Selection of History Teaching Content Under the View of Literacy Program. *Journal of Tianjin Normal University (Basic Education Edition)*, 23(04), 70-74.

Deng, N., & Yu, B. K. (2017). An Empirical Study on the Factors Influencing the Willingness of Enterprise Employees to Participate in Integrity Education. *Proceedings of the 19th China Management Science Academic Annual Conference*, 2017, 725-731.

Fu, C. Y. (2009). Improving the Quality of EMI for International Students. *Chinese Journal of Histochemistry and Cytochemistry*, 18(04), 451-453.

Gu, M. Y. (1998). *Dictionary of Education*. Shanghai: Shanghai Education Press.

Li, S. (2011). *Modern Teaching Theory*. Beijing: People's Education Press.

Li, Y. K. (2018). *Design and Empirical Analysis of University Course Quality Evaluation Index System*. Dalian: Dalian University of Technology.

Lin, L.-C., & Tsou, W. (2025).Technology-mediated online EMI professional development: Developing faculty self-efficacy and teaching practice through the community of inquiry framework.*System*, 133, 103727.

Lin, X. Z. (2011). *Survey Research on Chinese Language Learning Motivation of Myanmar Adults*. Beijing: Central University for Nationalities.

Liu, Y., & Qiao, M. (2015). Construction of Student Evaluation Index System for Classroom Teaching Quality of International Medical Undergraduate Students. *China Higher Medical Education*, 2015(10), 58-59.

Macaro, E., Curle, D., Pun, A., An, S., & Dearden, J. (2018).A systematic review of English-medium instruction in higher education.*Language Teaching*, 51(1), 1-35.

Marsh, H. (1987). Students' Evaluation of University Teaching: Research Findings, *Methodological Issues, and Directions for Future Research. International Journal of Educational Research*, 11(3), 253-388.

Ministry of Education of the People's Republic of China. (2019). Statistics on Study in China in 2018. http://www.moe.gov.cn/jyb_xwfb/gzdt_gzdt/s5987/201904/t20190412_377692.html. (Accessed November 10, 2024)

Peng, L. (2010). *Research on the Status Quo and Effectiveness of Bilingual Teaching in a Chinese University*. Changsha: National University of Defense Technology.

Praetorius, A. K., et al. (2018). Generic Dimensions of Teaching Quality: The German Framework of Three Basic Dimensions. *ZDM*, 50(3), 407-426.

Sun, W. S. (2003). Students' Correct Learning Attitude and Its Cultivation. *Contemporary Education Science*, 2003(19), 13-16.

Sun, X. Q., & Fu, W. (2008). Evaluation Index System and Application of Bilingual Teaching Effect--Taking the Teaching of English Classes in the College of International Business and Economics of Guangdong University of Foreign Studies as an Example. *Journal of Guangdong University of Foreign Studies*, 19(06), 95-98.

Wang, B. M. (2022). The Impact Mechanism of Teachers' Teaching Ability on the Value-Added of Students' Academic Achievement--An Empirical Analysis Based on the Research Data from The Eastern and Western Provinces of China. *Journal of Tianjin Normal University (Basic Education Edition)*, 23(04), 63-69.

Wang, S. (2009). Research on Quality Evaluation System of International Students' Education Based on Mathematical Statistics. *Journal of Hebei University of Science and Technology*, 30(03), 275-278.

Wang, X. P., & Suonan, R. Q. (2003). Statistical Mathematical Modeling and SPSS Application for Teaching Quality Evaluation in Higher Mathematics. *Journal of Qinghai Normal University (Natural Science Edition)*, 2003(03), 5-8.

Wang, Y., Li, W., & Liu, S. X. (2017). Research on Bilingual Teaching Quality Evaluation Index System of Economics and Management Based on Rooted Theory. *Education Modernization*, 4(52), 91-93, 98.

Wang, Y. S. (2013). An Empirical Study of College Students' Commitment to Learning--Based on the Data Analysis Of 2012 National Survey on College Students' Learning. *China Higher Education Research*, 2013(01), 32-36.

Weng, Z. L. (2011). *Research on Intellectual Property Capability of Small and Medium-sized ICT Enterprises*. Chengdu: University of Electronic Science and Technology.

Wu, G., & Zhou, J. R. (2015). Comparison of Teaching Evaluation of Teachers in Chinese and American Colleges and Universities and Its Implications-A Comparative Study Based on Two Schools. *Shanghai Education Evaluation Research*, 4(03), 22-28, 64.

Xiao, Y., & Yu, Q. F. (2017). The Experience of EMI of Analytical Chemistry Experiment for International Students Majoring in Pharmacy. *University Chemistry*, 32(08), 37-41.

Xu, M., Xiong, J. Q., Tang, Y. J., et al. (2016). Current Situation and Thoughts on the Development of Undergraduate Majors Taught in English for International Students Coming to China--Taking Beifang University of Technology as an Example. *Foreign Economic and Trade*, 2016(03), 152-154.

Yang, H. (2006). *Research on the Evaluation Standard of Classroom Teaching Quality in Colleges and Universities*. Wuhan: China University of Geosciences.

Yang, J. (2021). Teachers' Teaching Competence Development Status and Countermeasure Suggestions in the Context of Core Literacy--Based on the Questionnaire Survey of Primary and Secondary School Teachers in G City. *Modern Education Management*, 2021(12), 61-69.

Yang, Y. X. (2006). On the Change of Teachers' Teaching Attitude in the New Curriculum Reform. *Educational Theory and Practice*, 2006(03), 38-40.

Zhang, Z. H., & Geng, L. F. (2009). An Empirical Analysis of the Impact of Learning Attitude on College Students' Academic Performance. *China University Teaching*, 2009(10), 87-89.

Zhao, L. H. (2016). Research on the Evaluation of Bilingual Teaching Quality of Finance Majors in Colleges and Universities. *Journal of Higher Education*, 2016(08), 58-60.

Zhao, X., & Li, S. (2019). 70 Years of Change and Development of Teaching Method Research in China. *Curriculum, Teaching Materials, Teaching Methods*, 39(03), 14-21.

Zheng, N. (2022). International Students' Enthusiasm to 'study in China' is on the Rise. https://epaper.gmw.cn/lx/html/2022-12/20/nw.D110000lx_20221220_3-05.htm. (Accessed November 14, 2024)

APPENDEX 1

EMI Teaching Quality Evaluation Scale

	1	2	3	4	5	6	7
A1 Teachers are well-prepared for lessons, familiar with the content of the lectures, comfortable with off-script lectures.							
A2 Teachers do not miss classes, do not arrive late, and do not delay classes.							
A3 Teachers are appropriately dressed, enthusiastic in lecturing, full of energy, able to flexibly use body language.							
A4 Teachers focus on feedback and continuously improve teaching.							
A5 Teachers care for and understand students, help and inspire their learning.							
A6 Teachers respect students and encourage their participation in class.							
A7 Teachers help students, patiently answer students' questions about their learning and life, and provide students with counseling about their learning and life.							
A8 Teaching objectives illustrate basic theoretical knowledge accurately and clearly, with focus and inspiration.							
A9 Teaching contents are interesting and plenty, well analyzed and expanded.							
A10 Teaching focus on the combination of theory and practice, strengthen the practical aspects.							
A11 Teaching contents, assignments and examinations are reasonably arranged.							
A12 Teachers select and utilize appropriate teaching materials and provide extracurricular reading materials.							
A13 Teachers focus on inspiring students' thinking and motivating them to learn.							
A14 Teachers make effective use of various teaching media according to the features of the course.							
A15 Teachers focus on giving students guidance on learning methods.							
A16 Teachers emphasize the cultivation of students' creative ability, carry out classroom discussions, encourage students to question and express their own opinions.							
A17 Teachers use a variety of teaching methods and make full use of resources.							
A18 Teachers' language proficiency is high, fluent and clear in English.							
A19There is high quality teacher-student interaction and student engagement in the classroom.							
A20 Teachers have strong classroom management skills.							
A21 Teachers are well-educated, with good academic background.							
A22 Teachers are interested in teaching and good at lecturing and explaining.							
A23 Teacher-student interactions are two-way and the atmosphere in the classroom is lively.							
A24 When teachers complete the course, students are able to understand and master the basic theory and knowledge of the course.							
A25 Examination questions are scientific, grading is fair, and students' performance is outstanding.							
A26 The course is affective, so that the learning interest is greatly increased, and motivation for learning is stimulated.							
A27 The course is rewarding and helpful for students to improve their ability to analyze and innovate, and to solve some practical problems.							
A28 Students will prepare for the course, review and preview the course.							
A29 Students are attentive and active in class.							
A30 Students discuss problems with teachers after class.							
A31 Students have mastered relevant basic knowledge before taking professional courses.							
A32 Courses are challenging in terms of professional difficulty.							
A33 Students spent a lot of time in study after school.							
A34 Students frequently achieve excellent grades.							
A35 Students' learning process is hindered because of cultural differences.							
A36 Students are able to understand cultural differences and easily resolve misunderstandings during cultural communication.							