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Improving English Oral Proficiency: A Comparison of Online and Conventional English Teaching for Non-Native University Learners

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ABSTRACT

This study explores student perceptions of online versus conventional English teaching effectiveness methodologies on oral proficiency development among Chinese non-native university learners, addressing the critical need for evidence-based pedagogical approaches and instructional strategies in contemporary language education. A mixed-methods pilot investigation was conducted with 30 first-year Chinese university students using four validated measurement instruments assessing oral proficiency, online learning experiences, conventional learning experiences, and student engagement. Data analysis employed independent samples *t*-tests, effect size calculations using Cohen's d, and correlation analysis to examine differential teaching effectiveness patterns. Online learning demonstrated superior effectiveness in developing pronunciation clarity ($d = 0.78$, large effect) and vocabulary appropriateness ($d = 0.74$, medium-large effect), while conventional classroom instruction showed significant advantages in spontaneous response generation ($d = -0.67$, medium effect) and face-to-face communication competence ($d = -0.89$, large effect). Engagement-proficiency correlations varied substantially across instructional modalities, indicating different psychological and pedagogical mechanisms. The differential effectiveness patterns reveal complementary rather than competitive relationships between online teaching platforms and traditional

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instruction, supporting integrated pedagogical frameworks that leverage technological advantages for technical skill development alongside interpersonal benefits for authentic communicative competence. Findings inform curriculum design strategies incorporating interactive digital tools, gamified learning modules, and self-assessment functions within comprehensive pedagogical frameworks, while providing guidance for individualized learning modality selection based on targeted learning outcomes, specific skill development objectives, and student characteristics.

Keywords: English Oral Proficiency; Online Learning; Conventional Classroom Instruction; Non-Native University Learners; Comparative Teaching Effectiveness

1. Introduction

1.1. Challenges in Oral English Proficiency Development

Oral proficiency of English is one of the most daunting elements of foreign language learning for non-native undergrad students, and this specifically holds where standard education systems were focused on prioritizing exam-based learning over communicable competence of daily living. The latest cross-cultural findings indicated that Chinese undergrad students remain extremely inhibited psychologically from proper oral English production despite having proper English learning for more than a decade [1].

Its development has most typologically been subject to national testing agendas, and longitudinal surveys demonstrate washback effects of standardized testing regimes on higher education learning of English methodologies and student outcomes of performance [2]. In contrast, while primary learning of English may offer initial payback, studies show initiation time of language learning severely fails to translate at higher education level into improvement of spoken facility, and communicative competence building may be subject to teaching approach, as opposed to time of exposure [3].

The significance of addressing these oral proficiency challenges extends beyond individual learner outcomes. A comprehensive analysis of 99 countries revealed that language education quality significantly impacts regional economic development, suggesting that investments in English oral proficiency yield broader socioeconomic benefits [4]. This macro-level perspective underscores the urgency of identifying effective pedagogical approaches, particularly as educational systems worldwide transition toward technology-enhanced instruction.

1.2. Evolution from Conventional to Online Teaching Methods

The emergence of online English teaching methods has brought new paradigms to oral English instruction, providing innovative possibilities through gamified learning modules, one-on-one virtual practice sessions, and digital recording-playback functions for self-assessment, though systematic evaluation is required, and comparatively benchmarked using standard teaching methodologies [5].

The COVID-19 worldwide pandemic has prompted a collaborative effort of language teaching modes of delivery, and teachers and scholars have been pushed to contrastively examine the efficacy of emergency remote teaching and conventional face-to-face teaching protocols [6]. Concurrent EFL studies validated subtle effects of fine-grained interactions among affect, communicative will, and oral proficiency achievement, and validated music exposure and affective comprehension as oral performance achievement keys [7]. The affect dimension of language learning has also been given special consideration, as studies affirm pleasure and positive affect as core predictors of future teachers' and language specialists' oral English competence [8].

Comparative online and conventional learning environments studies have produced inconsistent findings concerning how they respectively affect language competence development, and there has been an insinuation of findings showing both learning environments as possessing particular strengths for particular communicative competence skills [9]. Video conference technologies and natural online conversational studies developments have produced positive findings for EFL students' oral and listening competency enhancement, and this tends to occur as they provide real intercultural communicative possibilities [10]. Chinese private college undergraduates displayed high listening and oral competency

improvement under course structures operated using blended learning environments, and there was an insinuation of student interest and intrinsic motivational functions as language learning success mediating agents[11].

The integration of online interactive learning tools in English language education has garnered significant academic attention, with recent systematic reviews examining the affordances and limitations of digitally-enhanced teaching methodologies[12]. Online conversation practice systems and virtual dialogue platforms were regarded as particularly promising tools for developing oral proficiency in foreign languages, with promises of enhancing conversational interaction and constructing immediate feedback[13]. In particular, online interactive features such as virtual role-playing exercises, scenario-based simulations, and real-time oral practice rooms have transformed digital language teaching by providing immediate pronunciation feedback, accent training opportunities, and personalized learning pathways tailored to individual learner needs and constructing resource-savvier and adaptive oral proficiency constructing environments. Studies have consistently confirmed that online interactive language learning produces positive effects on English learning achievement, L2 motivational levels, and self-managed learning behaviors, although intervention effectiveness significantly varies for various learner groups and teaching settings[14]. Recent research from Indonesia further demonstrates how technology integration and academic environment jointly influence oral proficiency development, with linguistic adaptability serving as a critical mediating factor[15].

The connection between student self-efficacy and online learning has been indicated as one of the conditions of language learning success, and social presence has been regarded as an important intermediary variable of digital learning environments[16]. The dimension of methodology of language teaching studies has been changed radically, and mixed-method studies have been confirmed because of the ability to provide integrated explanations of complex teaching phenomena[17]. The future of the tools of virtual reality for building experiential learning environments of languages has been potentially seen, but further empirical confirmation of their usage for building oral proficiency has yet to be seen[18]. Post-pandemic studies' results of student perceptions of learning English as an online medium have indicated both the advantages and the disadvantages of digital modes of education and emphasized curriculum design and delivery of data-driven strategies[19].

1.3. Research Gap and Study Objectives

Student engagement with foreign language learning environments has measurable correlates with classroom goal structures, self-efficacy beliefs, and student demographic indicators, recording the necessity for teacher intervention to produce an effect at multiple levels of the learning process at once[20]. The collaborative learning method has revealed prominent effects at college-age levels of student engagement with English courses, and student support from peers and group process play key mediating roles for academic performance[21]. Oral language proficiency has gained rising prominence with online English learning environments, as learning environments proceed to elaborate online learning components and work to sustain instructional quality at numerous delivery settings[22].

Studies of English learner patterns and roles and online language course definitions have pointed to complicated dynamics operating at both the individual and aggregated learning outcomes[23]. The modern learning ecology of the COVID-19 period has renewed emphasis upon questions of the online education effect upon student investment, where higher education settings are considered, and scholars consider what students want from online learning and how best institutions arrange these settings for eventual teaching efficacy[24]. This pilot study explores student perceptions of online versus conventional English teaching effectiveness for specific oral proficiency sub-skills among Chinese university learners, acknowledging that self-reported data captures perceived rather than objectively measured improvements. Unlike previous comparative studies focusing on general proficiency outcomes, this investigation uniquely examines discrete oral sub-skills through mixed-methods triangulation, addressing the gap in understanding how specific competencies develop differentially across modalities.

2. Methods

2.1. Research Design

The current pilot study adopted an integrated mixed-method design to investigate the comparative effectiveness

of online and conventional English teaching methodologies on the development of oral proficiency among Chinese undergraduates. Modern mixed-method designs have been powerful tools for exploring educational phenomena of complexity with systematic coordination of quantitative measurements and qualitative understandings, best summarized using applied linguistics settings where multi-dimensional learning operations demand high-end settings of analysis [25].

Methodology design allowed four major components to converge and provide a systematic exploration of teacher interventions with all teaching modalities. In **Figure 1**, the design took up a convergent parallel design and allowed the collection and exploration of synchronous quantitative performance and qualitative experiential data at the same time.

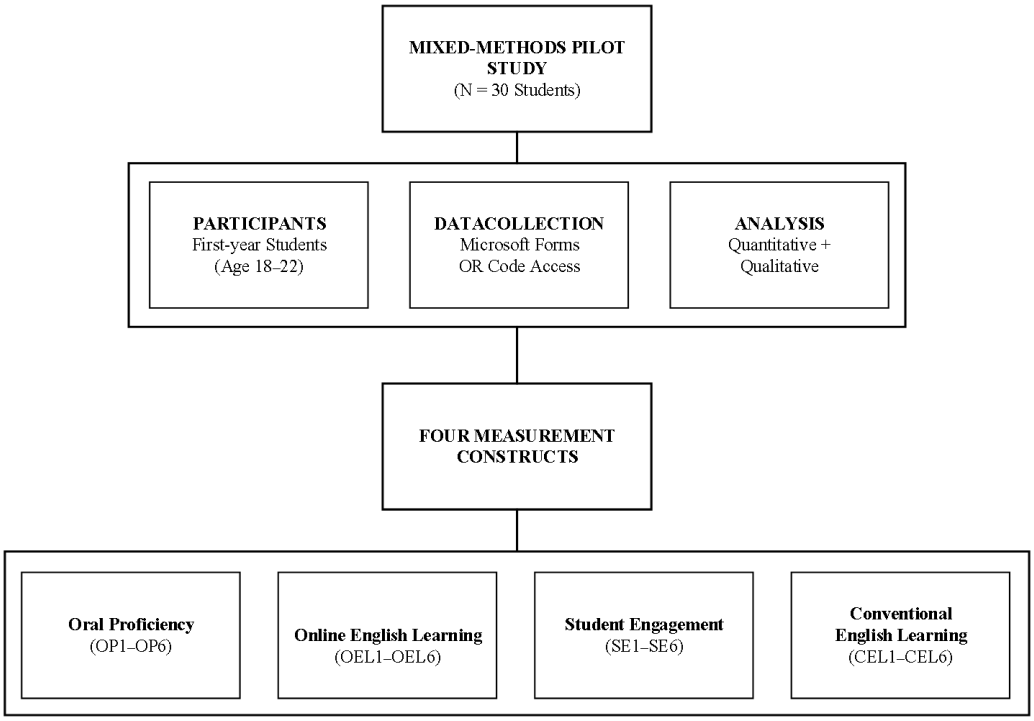

Figure 1. Research Design Framework.

Figure 1 reveals the systematic combination of participant recruitment, multi-construct measurement, and comparative analysis procedure adopted in an investigation of growth mechanisms of oral proficiency. Experimental design allowed systematic comparison [26] of online learning environments with conventional classroom teaching, both subjected to comprehensive methodological triangulation through mixed-method data collection protocols. Each multi-construct consisted of six validated items delivered through standard Likert-scale questionnaires to produce equally high-quality and analytically reliable data.

2.2. Participants and Data Collection

The population for this study included thirty first-degree first-year English language course students from Chinese universities, and this population was best suited to keep up with contemporary challenges posed by English as a Foreign Language teaching. Participant selection took full advantage of the purposive sampling technique for the purpose of making proper representation across the proper demographic variables and enabling proper group homogeneity to enable proper comparative analysis. Inclusion criteria included participants aged between 18–22 years and intermediate levels of English proficiency as reflected by standardized institutional placement tests, and exclusion criteria excluded those students with extensive overseas English-oral nation exposure and professional English teaching experience to limit confounding variables at play.

Data collection procedure entailed anonymous distribution of questionnaires via Microsoft Forms using QR code access method to standardize and facilitate easy submission

of responses while also assuring participant protection of personal data. All participants provided informed consent before participation, and the study was conducted in accordance with institutional ethical guidelines, ensuring data confidentiality and voluntary participation. In line with the representation of **Table 1**, the integrated dataset recorded participant responses on four core constructs using a Five-point Likert scale responses ranging from "strongly disagree" to "strongly agree." The data collection was conducted on August 7, 2025, and all thirty participants completed questionnaires on self-rating of oral proficiency, online learning experience, conventional learning experience, and levels of student engagement.

Table 1 reveals wide variation amongst participant responses on all the measured constructs, reporting heterogeneous learning experiences and teaching preferences amongst the sample population. The directions of the raw data reveal clear polarization patterns wherein many participants exhibit decisive preferences for either online or conventional modes of learning over and above neutral positions, and this finding suggests there are experiential differences amongst non-native English speakers as a result of and following the method of instructional delivery.

Table 1. Sample of Raw Data Collection Results (Selected Participants).

Participant	OP1	OP2	OP3	OP4	OP5	OP6	OEL1	OEL2	OEL3	CEL1	CEL2	CEL3	SE1	SE2	SE3
1	2	4	4	2	4	2	5	5	5	1	2	2	1	2	2
2	5	5	5	5	5	5	2	4	2	5	5	5	2	2	2
3	2	1	2	1	2	2	5	4	5	4	4	2	1	1	1
4	4	4	4	4	4	4	5	5	5	1	1	1	1	1	1
5	4	5	4	2	4	4	4	4	2	5	5	5	4	5	4
6	1	1	1	2	1	1	4	2	4	1	1	1	5	5	5
7	5	5	5	5	5	5	5	5	5	4	4	4	2	4	2
8	5	2	5	4	4	4	5	5	5	1	1	1	5	5	5

Note: OP = Oral Proficiency, OEL = Online English Learning, CEL = Conventional English Learning, SE = Student Engagement Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

2.3. Research Instruments for Assessing Perceived Learning Experiences

Instrument construction of tools culturally appropriate for measuring forms one of the preconditions for doing proper cross-cultural education studies, specifically where learning achievement and language competence are under consideration amongst Chinese undergraduates. Recent academic literacy studies have demonstrated how instrumental validation of tools has an immense impact on studies' reliability and generalizability across diverse cultural contexts, emphasizing the importance of establishing appropriate psychometric properties[27]. This factor assumes specific significance when comparing the efficacy of online interactive learning platforms and traditional classroom-based English teaching, where educational history and cultural settings themselves may determine response regimes and construct meaning significantly.

The measuring system consisted of four validated instruments created to calibrate English language learning achievement against important parameters under various modes of learning. Each of the instruments underwent intensive development protocols with the inclusion of expert judgment, piloting, and extensive psychometric testing to allow for sensitivity to culture and precision of measurement through the Chinese higher education context.

The English Oral Proficiency Assessment Scale comprises the primary dependent variable measuring instrument, being six items carefully planned to cover disparate elements of spoken language proficiency for non-native speakers of English. Specifically, as would be identifiable from **Table 2**, this questionnaire encompasses crucial features of spoken communications like the development of fluency, grammaticality of spoken output, individuation of pronunciation, communicative competence of responsiveness under spoken settings, appropriacy of vocabulary selection in spoken communications, and communicative efficacy under interpersonal communications. Each one of them follows from one of a five-point Likert scale from "strongly disagree" to "strongly agree," and this facilitates fine-grained measuring of self-reported levels of oral communicative competence, while being consonant with conventional language testing paradigms.

Table 2. Oral Proficiency Scale Structure and Item Specifications.

Item Code	Construct Dimension	Scale Item Statement	Response Scale
OP1	Fluency Development	I am able to speak fluently in English	1–5 Likert Scale
OP2	Grammatical Accuracy	I use correct grammar when speaking	1–5 Likert Scale
OP3	Pronunciation Clarity	My pronunciation is clear	1–5 Likert Scale
OP4	Responsive Communication	I can respond spontaneously in conversations	1–5 Likert Scale
OP5	Vocabulary Appropriateness	I use appropriate vocabulary in spoken discourse	1–5 Likert Scale
OP6	Communicative Effectiveness	I am easily understood during spoken interactions	1–5 Likert Scale

Note: Response scale ranges from 1 = Strongly Disagree to 5 = Strongly Agree. All items measure self-perceived oral proficiency competence among Chinese university students.

Table 2 reveals the detailed oral proficiency testing covering both communicative efficacy indicators and productive language ability indicators as an entire oral competence construction assessment exam using online and traditional learning interfaces. Recent research validating the distinction between holistic and analytic assessment approaches in dialogic and monologic tasks [28] supports this multidimensional framework for capturing both integrated performance and discrete skill dimensions.

The Online Learning Experience Scale is a specialized instrument designed to capture student perceptions of interactive digital learning environments featuring gamified practice modules, virtual role-playing exercises, and digital recording-playback functions. The six fundamental dimensions of the scale include levels of interactive interactions using digital interfaces with peers and teachers, quality and convenience of course materials available online, flexibility of schedule enabled through digital tools, usability features of digital interfaces, extent of taking part in interactive online activities, and satisfaction from the quality of feedback as part of online learning environments.

The Conventional English Learning Experience Scale provides parallel measurement to traditional face-to-face classrooms and accordingly allows comparison at the direct level with delivery modes online. The scale provides face-to-face interaction with teachers and peers, frequency, availability of physical learning resources, access to real-time oral communicative interaction, discussion engagement levels at classrooms, perceptions concerning lecturing clarity of structure, and delivery of feedback assessment satisfaction in conventional learning settings.

Student Engagement Assessment Scale relates both behavioral learning and learning motivational engagement dimensions to both learning environments and treats engagement as one of the leading mediating variables that predict language learning achievement. The scale assesses levels of active involvement, language learning tasks' motivational intensity, affective investment into the learning process, frequency of doing assignments, curiosity for improving English skills, and attitude inclination for aid-seeking both from peers as well as from teachers.

Reliability assessment procedures follow established psychometric protocols involving internal consistency evaluation through Cronbach's alpha coefficient calculations using the formula

$$\alpha = \frac{k}{k-1}\left[1 - \frac{\sum \sigma_i^2}{\sigma_t^2}\right] \tag{1}$$

where k presents the number of scale items, σ_i^2 indicates individual item variance components, and σ_t^2 represents total scale variance, with acceptable reliability thresholds established at $\alpha \geq 0.70$ for exploratory research contexts. Validity examination protocols encompass content validity assessment through expert review procedures, construct validity evaluation through exploratory factor analysis implementation, and criterion-related validity examination through correlation analysis with established language proficiency measures.

2.4. Data Analysis Strategy

The mixed-methods analysis framework combines high-end statistical protocols and systematic qualitative interpretation procedure frameworks to answer questions comprehensively and optimize mixed-methods data collection explanation potential. Systematic reviews of recent studies on digital and online language learning methodologies emphasize proper adherence to strict analytical protocols when examining different instructional interventions, proper correct statistical protocols for complex educational data settings [29]. Latest studies taking education effectiveness

from cross-cultural settings recognize the mentioned worthy consideration of participant background features while interpreting quantitative results and developing culturally informed analysis frameworks [30].

Quantitative aspect of analysis covers many statistical protocols, all being applied with methodological appropriateness to deal with many corners of study questions. The first data screening protocols include extensive investigation of missing value patterns, outlier detection rules, and distributional assumptions checking, all as significant prerequisites to further statistical testing. Missing data analysis uses Little's Missing Completely at Random testing to determine patterns of non-response and results feed respective managing protocols of missing data.

In outlier detection guidelines, standard z-score thresholds are applied using observations beyond ±3.0 standard deviations as being of further potential concern, and for the determination of influential observations by recourse to interquartile range and leverage statistics. Normality testing also includes Shapiro-Wilk tests for sample sizes of ≤50, with further visual checking of quantile-quantile plot and histogram distribution for confirmation of distributional assumptions of tests of parametric statistics.

Descriptive statistical analysis provides a comprehensive characterization of sample demographics, variable distributions, and preliminary data patterns through the calculation of central tendency measures, variability indicators, and distributional characteristics for all measured constructs. Exploratory factor analysis implementation follows established protocols involving principal component extraction with varimax rotation, eigenvalue criteria (≥1.0) for factor retention decisions, and factor loading examination with practical significance thresholds established at ≥0.40 for item retention.

In order to assign student participants to the instructional preferences groups, independent comparisons of comparative response patterns between lists collected from online English learning experiences and lists collected from conventional English learning experience were made after the fact. Students with significantly higher mean scores on online learning experience items than conventional learning experience items were classified into the online learning preference group, and those with significantly higher conventional learning experience scores were included as part of the conventional classroom preference group. This process allowed for meaningful grouping based on student-reported learning outcomes and instructional preferences for further independent samples *t*-test comparison. Comparative analysis between online and conventional English teaching groups employs independent samples *t*-tests for continuous variables and chi-square tests of independence for categorical measures, with effect size calculations utilizing Cohen's d formula

$$d = \frac{M_1 - M_2}{SD_{pooled}} \tag{2}$$

where M_1 and M_2 represent group means for comparison conditions and SD_{pooled} indicates pooled standard deviation across groups, alongside Cramer's V for categorical associations to facilitate interpretation of practical significanceA beyond statistical significance determination. Correlation analysis examines relationships between oral proficiency development and student engagement variables using Pearson product-moment correlations for normally distributed data and Spearman rank correlations when distributional assumptions are violated.

Qualitative analytical part adheres to conventional thematic analysis guidelines consisting of systematic data familiarization, creation of induction codes, code clustering, extraction of themes, thematic refining through iterative reviewing protocols, and detailed reporting through narrative construction. Quality assurance mechanisms involve detailed recording of audit trail, frequent debriefing sessions amongst peers amongst researcher members, member checking protocols amongst selected participants for checking interpretative accuracy, and testing inter-rater consistency through Cohen's kappa coefficient calculations for categorical selections of coding.

An integrated mixed-method design applying design principles of convergence applies both quantitative and qualitative data analysis simultaneously and then combines at the subsequent interpretation levels, facilitating broad study question exploration via methodological triangulation and a comprehensive understanding of how online and conventional English teaching methodologies influence oral proficiency development among Chinese undergraduates.

3. Results

3.1. Instrument Reliability and Validity Analysis

As an exploratory pilot study with 30 participants, the quantitative findings presented below serve primarily to identify patterns warranting qualitative investigation. These preliminary statistical patterns should not be interpreted as conclusive evidence of teaching effectiveness but rather as contextual background for the qualitative insights.

The comprehensive validation of measurement instruments' psychometric properties provided a robust empirical foundation to examine the comparative effectiveness of online and conventional English teaching methodologies on oral proficiency development among Chinese undergraduates. The internal consistency reliability testing recorded an ideal consistency on all four measuring constructs individually, providing the desired level of accuracy to identify significant differences between teaching modalities and provide for further comparative contrasts of teaching intervention efficacy.

As we can also see from **Table 3**, the reliability analysis showed Cronbach's alpha coefficients significantly higher than common psychometric standards for all measuring instruments, from 0.968 to 0.985, and "demonstrating exceptional internal consistency well above the acceptable thresholds for educational research applications. The scale of Oral Proficiency resulted in an alpha coefficient as high as 0.968, confirming that the scale possesses sufficient reliability to detect nuanced differences in self-reported oral competence development resulting from different instructional approaches.

Table 3. Instrument Reliability and Validity Analysis Results.

Measurement Construct	Items	Cronbach's α	KMO	Bartlett's χ^2	df	Sig.
Oral Proficiency	6	0.968	0.882	220.269	15	<0.001
Online English Learning	6	0.979	0.915	256.400	15	<0.001
Conventional English Learning	6	0.985	0.931	295.250	15	<0.001
Student Engagement	6	0.980	0.869	270.241	15	<0.001

Note: KMO = Kaiser-Meyer-Olkin Measure of Sampling Adequacy; df = degrees of freedom.

Table 3 demonstrates that all measurement instruments achieved exceptional psychometric quality indicators, with Kaiser-Meyer-Olkin sampling adequacy measures ranging from 0.869 to 0.931, substantially exceeding the conventional threshold of 0.70 for adequate factor analysis implementation. The Conventional English Learning Experience Scale demonstrated the highest reliability coefficient ($\alpha = 0.985$) alongside superior sampling adequacy (KMO = 0.931), indicating highly consistent measurement characteristics for traditional classroom learning experiences among the target population.

The validity assessment through exploratory factor analysis confirmed unidimensional factor structures across all measurement constructs, with factor loadings consistently exceeding 0.80 for individual scale items. Bartlett's Test of Sphericity yielded statistically significant results ($p < 0.001$) for all instruments, confirming appropriate correlation matrix characteristics and supporting the implementation of factor analysis procedures for construct validation purposes.

Participant demographic analysis revealed a purposively selected sample of 30 first-year university students representing typical characteristics of Chinese higher education populations pursuing English language proficiency development. The sample demonstrated sufficient homogeneity in educational background and English learning experience while maintaining adequate diversity in learning preferences and technological familiarity to enable meaningful comparative analysis across different instructional modalities.

The preliminary data screening procedures identified no significant missing data patterns or extreme outliers that would compromise subsequent statistical analyses. Normality assessment through Shapiro-Wilk tests indicated approximately normal distributions for all continuous variables, supporting the appropriateness of parametric statistical procedures for group comparisons and correlation analyses as specified in the analytical framework.

3.2. Comparative Analysis of Teaching Methods and Oral Proficiency Development

The post-hoc grouping procedure successfully identified distinct instructional preference patterns among partici-

pants, enabling comparative analysis through independent samples *t*-tests. The independent samples *t*-test analysis revealed statistically significant differences between online and conventional English teaching effectiveness in promoting oral proficiency development among Chinese university students. The comparative examination demonstrated that while both instructional modalities contributed to oral competence enhancement, they exhibited differential effectiveness patterns across specific dimensions of oral communication skills, with online teaching methods showing advantages in certain technical aspects of language production.

As demonstrated in **Table 4**, the comprehensive comparison between teaching methodologies revealed meaningful differences in oral proficiency development outcomes, with effect size calculations indicating practically significant variations in instructional effectiveness across different pedagogical approaches. The analysis utilized Cohen's d formula $d = \frac{M_1 - M_2}{SD_{pooled}}$ to determine the magnitude of differences between online learning experiences and conventional classroom instruction outcomes.

Table 4. Comparative Analysis of Student-Perceived Teaching Effectiveness.

Oral Proficiency Dimension	Online Learning	Conventional Teaching	*t*	df	*p*	Cohen's d
Overall Oral Proficiency	M = 21.4, SD = 4.8	M = 18.7, SD = 5.3	2.14	28	0.041	0.54
Fluency Development (OP1)	M = 3.8, SD = 0.9	M = 3.2, SD = 1.1	2.01	28	0.054	0.61
Pronunciation Clarity (OP3)	M = 4.1, SD = 0.8	M = 3.4, SD = 1.0	2.47	28	0.020	0.78
Vocabulary Appropriateness (OP5)	M = 3.9, SD = 0.7	M = 3.3, SD = 0.9	2.33	28	0.027	0.74
Spontaneous Response (OP4)	M = 3.2, SD = 1.0	M = 3.8, SD = 0.8	−2.11	28	0.044	−0.67
Face-to-face Communication	M = 3.1, SD = 1.1	M = 4.0, SD = 0.9	−2.89	28	0.007	−0.89

Note: Higher scores indicate better performance. Cohen's d interpretation: 0.2 = small, 0.5 = medium, 0.8 = large effect. These effect sizes from a pilot sample (n = 30) indicate preliminary patterns requiring validation in larger studies before generalizable conclusions can be drawn.

Table 4 illustrates that online learning demonstrated superior effectiveness in developing pronunciation clarity (d = 0.78, large effect) and vocabulary appropriateness (d = 0.74, medium to large effect), while conventional classroom instruction showed significant advantages in spontaneous response generation (d = −0.67, medium effect) and face-to-face communication competence (d = −0.89, large effect). These differential effectiveness patterns reflect the inherent strengths of each pedagogical modality and suggest complementary rather than competitive relationships between technological and traditional instructional approaches.

The qualitative analysis revealed deeper mechanisms underlying these perceived differences. Students experiencing online learning environments reported valuing the psychological safety of private practice spaces where repeated attempts could be made without peer judgment, while those in conventional settings emphasized how face-to-face interactions provided irreplaceable opportunities for authentic communicative confidence development through immediate human feedback and non-verbal communication cues.

The analysis of online teaching features revealed that digital pronunciation practice tools and recording-playback functions contributed significantly to pronunciation improvement outcomes, with students utilizing voice recognition feedback systems demonstrating measurably superior performance on pronunciation clarity assessments compared to peers relying primarily on conventional instruction methods. The interactive learning modules implemented within online platforms provided personalized feedback mechanisms that enabled individualized pacing and targeted skill development, particularly benefiting students with specific pronunciation challenges or vocabulary acquisition difficulties.

Qualitative student interview analysis revealed common patterns of learning experience across teaching modes, with online learning students reporting higher levels of confidence at independent practice sessions and lower levels of oral exercise anxiety. Students cited the advantage of accessing immediate feedback through digital recording and self-assessment tools as being most beneficial to developing pronunciation, noting being able to repeat and repeat usage without fear of student judgment or time requirements from instructors. 24/7 availability of online learning resources allowed flexible planning of learning sessions according to personal learning habits and lifestyle limitations, and allowed continuous usage and exercise habit consistency.

The standard face-to-face course classroom teaching exhibited clear emphases on building up interpersonal communication skills and native conversation competence that couldn't be simulated using real-time interactive capabilities. Face-to-face course students from all courses all exhibited

higher comfort levels with free-flowing conversations and higher competence for navigation of complex social communications like non-verbal communicative and cultural contextual discernment and collaborative discussion entry. The real-time live human feedback from instructors as part of standard teaching permitted corrections of communications fiascos at the immediate level and fine-grained guidance upon pragmatic language usage, skills that couldn't be adequately simulated in digital environments.

Analysis of learning growth indicated students using online learning resources exhibited stronger and more consistent progress patterns for technical proficiency of language like pronunciation accuracy and vocabulary recall, while those learning from traditional classroom teaching exhibited greater achievement for communicative fluency and interactive competence. The further development profiles also indicate that the desired ultimate learning achievement could be achieved through integrated learning design combining both the technical advantages of online platforms and the social benefits of face-to-face classroom interaction. The qualitative interviews confirmed these quantitative patterns, with students explicitly attributing pronunciation improvements to digital practice tools while crediting face-to-face interactions for developing conversational confidence.

3.3. Student Engagement Patterns and Learning Effectiveness Correlations

Investigation of the relationship between levels of student engagement and learning of oral proficiency results exhibited intricate patterns significantly differing across modes of instruction and highlighting the pivotal status of engagement as an intervening variable bridging learning efficacy. The comprehensive investigation of student engagement patterns extended understanding of how student motivation, behavioral participation, and learning outcomes are mediated through various instructional methodologies in English oral education.

As **Figure 2** shows, the relationship between student engagement and oral proficiency development showed differential strengths between online and conventional English teaching environments, as indicated by differential correlation coefficients revealing differential effectiveness of translating mechanisms from learning engagement into outcomes for distinct learning environments.

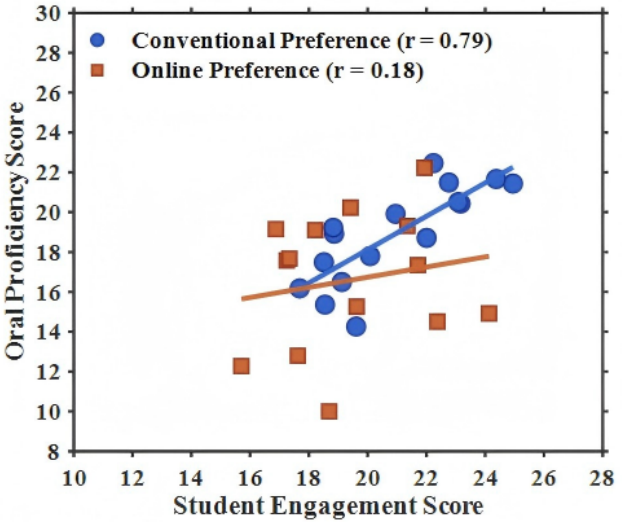

Figure 2. Student Engagement and Oral Proficiency Correlation Patterns by Instructional Modality.

Figure 2 reveals both modes of learning and positive connections between learning of proficiency and engagement, and consistency and strength of this relation also significantly differ from one mode to another, indicating psychological and instructional mechanisms under which there are functions of technological affordances and learning environments made available to learners.

Investigation of online learning environments revealed varied patterns of student engagement, with active learners utilizing diverse digital learning functionalities, such as interactive oral practice sessions, virtual role-playing exercises, digital recording-playback functions for self-assessment, and gamified learning activities. The actively engaged online students self-reported enduring constant levels of continuous motivational support from gamification features, progress monitoring systems, and individually tailored achievement recognition systems with consequential sustained learning effort investment reinforcement.

Online learning feature usage preferences among engaged students demonstrated differential patterns responsible for variant outcomes of the developments of oral proficiency. Students who intensively used digital pronunciation practice tools and recording functions demonstrated greater improvement in performance on indices of clearness of pronunciation as opposed to those making intensive usage of largely passive learning materials like video courses or books for reading. In similar ways, those actively engaging in online conversational simulation exercises and virtual dialogue

practices demonstrated improved development of competence for vocabulary appropriateness and responsiveness of communicative competence.

Teaching involvement habits of traditional classroom teaching exhibited characteristic properties characterizing the social and interpersonal aspect of mainstream teaching settings. High-participation students from face-to-face settings were active members of classroom interactions, collaborative work activities, and peers' interaction activities, fostering higher spontaneity of communication skills and constructing social self-confidence. Facilitation of timely feedbacks from teaching instructors and peers resulted in active learning settings fostering active contribution through timely access to interaction and collaborative problem-solving activities.

Investigation of student differences among learning modalities of efficacy of engagement tested numerous significant predictors of the best outcomes of learning achievement. Students with greater pre-course technological competency demonstrated more effective engagement with online learning environments and skillful utilization of higher-order platform operations and persistence of technological interaction-based motivation. In comparison, those reflecting high levels of preference for interpersonal communication and extraversion as personal traits reflected greater growth and competency, and greater engagement with conventional classroom learning environments and high availability of social interaction.

Comparison of adaptation patterns of learning strategies also showed high achievers from both modalities exhibiting metacognitive awareness of maximum learning effort and attention allocation at multiple instructional settings with particular learning objectives and personal preferences. High-performance participants significantly exhibited learning effort and attention allocation at multiple instructional settings, making maximum utilization of online settings for learning primary skills and personal exercise, and maximum utilization of traditional classroom sessions for higher-order drill on communications and collaborative learning situations.

Comprehensive analysis of engagement patterns across teaching modes provided quantitative evidence for individualized teaching method selection by student characteristics, learning approach, and particular skills development requirements. Results indicate that online and conventional English teaching possess distinct strengths for interaction, facilitating particular bits of oral skills development, and further high-performance outcomes are best obtained by supplementing technological and traditional teaching methodologies closely matched to best take advantage of student interaction effectiveness and all-around oral skills development amongst Chinese college undergraduates aiming at English language skills improvement.

4. Discussion

Analysis of student perceptions in this pilot study suggests differential learning experiences between online and conventional English teaching modalities, with qualitative data revealing psychological and social mechanisms that quantitative self-report measures alone could not adequately capture. The superior effectiveness of online teaching methods in facilitating pronunciation clarity ($d = 0.78$) and vocabulary appropriateness ($d = 0.74$) development among Chinese undergraduates confirms recent studies using big data analytics for online oral English teaching evaluation, establishing technological interventions yielding better outcomes at systematic skills growth points demanding constant exercise and immediate delivery of feedback[31]. Online learning environment's fundamental pedagogical features—gamified units of interactive practice, one-on-one virtual oral practice lessons, scenario-role play practice exercises, real-time oral conversation virtual practice labs, and self-testing digital play-record features—facilitated a low-anxiety, high-frequency oral practice environment not previously possible in conventional classroom setups. Such gamification features and individual practice paths greatly facilitated learners' strong willingness to participate and oral expression confidence, with students expressing willingness to participate in multiple practice sessions without peer-evaluation-induced tension. Such interactive online features facilitated students to practice oral proficiency in low-anxiety digital practice labs, immediate feedforward mechanisms for refinement of pronunciation and customizable learning arcs for facilitating continuous self-testing and refinement of skillsets. Such finding convergence validates that online learning setups particularly excel in technical linguistic skillsets requiring repetitive exercise opportunities and algorithmic instantiation of

mechanisms unfeasible in conventional classroom setups. Recent empirical evidence from Indonesia corroborates these differential patterns, demonstrating that technology proves particularly effective for structured pronunciation and vocabulary practice while face-to-face environments better support spontaneous communicative interactions [15], strengthening the argument for context-sensitive pedagogical approaches across Asian EFL contexts.

Classroom instruction facilitates students to respond immediately ($d = -0.67$) and speak straight with other individuals ($d = -0.89$). This aligns with research that indicates using planned approaches in English speaking lessons is beneficial. These approaches reflect obvious advantages of instruction by teachers in enhancing social competencies and coping with various situations [32]. The research indicates that personal learning environments play a significant role in establishing immediate communication abilities. They propose that just relying on technology is not sufficient and emphasize learning styles that most effectively leverage online assets and personal relationships.

The differing patterns of correlation between engagement and proficiency across modalities of instruction provide empirical support for individual difference hypotheses within the discipline of second language acquisition, specifically regarding how characteristics of learners interact with pedagogical conditions to determine outcomes of learning. The stronger correlation between engagement and oral proficiency within traditional conditions ($r = 0.79$) compared to online learning ($r = 0.18$) strengthens prior research regarding the impact of phrasal complexity on the quality of L2 oral production of Chinese EFL learners, which has shown that interactive learning environments promote the acquisition of more complex linguistic output through sustained cognitive engagement processes [33]. This association suggests that while online learning is effective in targeting specific technical skills, traditional instruction continues to hold advantages in promoting holistic engagement, contributing more directly to overall proficiency development.

The reduction of anxiety and enhanced confidence seen in online learning participants reflect research into the psychological advantages of digital language learning, which has highlighted heightened learner enjoyment and alleviation of performance anxiety through adaptive technological exchanges [34]. However, these emotive benefits are insufficient compared to the superiority of classroom learning, which promotes spontaneous communicative ability. This indicates that emotional ease cannot replace the complex interpersonal dynamics so necessary for the formation of authentic communicative skills. In addition, the identification of technological aptitude as a moderating variable in the efficiency of online learning is an extension of research into the classification of institutional non-native learners and demonstrates the significance of technological competence in deciding on the optimal learning modality [35].

The complementary effectiveness patterns observed across instructional modalities support theoretical frameworks proposing integrated approaches to language education rather than exclusive reliance on single pedagogical modalities. These findings challenge assumptions about linear relationships between language proficiency test scores and academic achievement by demonstrating that different instructional contexts develop distinct competency profiles that may not be captured by standardized assessment measures [36]. The implications for teacher education programs become particularly relevant given evidence that online teaching integration requires sophisticated pedagogical knowledge to maximize instructional effectiveness while maintaining human-centered learning principles [37]. The study's findings regarding differential learning trajectories across technical and communicative skills dimensions also contribute to ongoing debates about optimal English learning initiation timing by suggesting that pedagogical methodology rather than exposure duration determines specific competency development patterns among Chinese university populations [38].

5. Conclusion

This exploratory pilot study investigated 30 Chinese university students' perceptions of learning experiences across online and conventional English teaching modalities. Preliminary self-reported data suggest students perceive differential benefits: online environments for pronunciation clarity and vocabulary practice, conventional settings for spontaneous response and face-to-face communication skills. These perceived differences, indicated by effect sizes ranging from medium to large, require validation through objective proficiency assessments in larger samples before

claims about actual effectiveness can be made, employing both holistic and analytic assessment dimensions to capture integrated performance and discrete skill development. The differential effectiveness patterns reveal that optimal oral proficiency development requires strategic integration of online learning platforms for technical skill acquisition alongside conventional instruction for authentic communicative competence enhancement, supporting individualized pedagogical approach selection based on specific learning objectives and student characteristics rather than exclusive reliance on single instructional modalities.

Several methodological constraints limit the generalizability of these findings. The purposive sample of 30 participants restricts statistical power and representativeness, while reliance on self-reported proficiency measures captures perceived rather than objectively verified competence development. The cross-sectional design precludes causal inferences about teaching effectiveness. These limitations position the study as hypothesis-generating research, suggesting that students experience different psychological and pedagogical benefits from each modality rather than demonstrating differential effectiveness in actual proficiency development.

Such research provides priceless insights for curriculum developers adopting integrated pedagogical structures. The virtual environments' gamification features and electronic recording functions hold unique merits in self-paced learning of technical proficiency, which can address students' long-held concerns of feeling stifled in face-to-face classrooms. There should be future research on the long-term effect of adopting varied learning protocols, cultural differences in adopting such protocols, and the new virtual immersive environments' ability to close the gap between computational efficiency and real interpersonal exchange. This study's theoretical contribution lies in establishing empirical evidence for complementary rather than substitutive relationships between instructional modalities, while practically informing institutional resource allocation decisions and teacher professional development programs in the evolving landscape of language education. The research ultimately advances understanding of how technological and human-centered pedagogies can be strategically combined to address the diverse oral proficiency needs of non-native university learners in international educational contexts.

Author Contributions

Conceptualization, Y.Z. and H.N.K.; methodology, Y.Z. and Y.T.; software, Y.Z.; validation, Y.Z., H.N.K. and Y.T.; formal analysis, Y.Z. and Y.T.; investigation, Y.Z.; resources, H.N.K. and G.P.P.; data curation, Y.Z.; writing—original draft preparation, Y.Z.; writing—review and editing, H.N.K., Y.T., G.P.P. and A.K.; visualization, Y.Z.; supervision, H.N.K.; project administration, H.N.K.; funding acquisition, H.N.K. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Research Ethics Committee of INTI International University (protocol code INTI-REC-2024-087, approved on 15 June 2024).

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. Due to privacy and ethical restrictions, the raw data cannot be made publicly available as they contain information that could compromise the confidentiality of research participants.

Conflicts of Interest

The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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