

The Influence of Soft and Hard Skills on English-Speaking Proficiency: Moderating Effects of Technology-Based Resources and Motivation among College Students in Nanchang, China

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Abstract

This study primarily aimed to examine the relationship between soft and hard skills and English-speaking proficiency among college students in Nanchang, China, while exploring the moderating effects of technology-based resources and motivation. It addresses a significant gap in English language learning research concerning the interaction among these key variables. Four research objectives were drawn up to answer four research questions using as a background a few theories. One aim was to examine the role of technology-based resources as well as motivation which is believed to enhance the influence of soft and hard skills to improve the speaking of English. A quantitative survey design was employed, with 387 students participating. Data collection involved an instrument which was adapted from various sources. The design involved the initial collection and analysis of quantitative data. Quantitative data was analysed using SPSS-27. The findings revealed significant positive correlations between all the variables which were identified. Moreover, the study identified the moderating role accurately. All the hypotheses were also accepted. By filling a theoretical gap, this research contributes valuable insights that can guide educational policy and practices aimed at enhancing language learning outcomes. Furthermore, the study offers practical implications for educators, suggesting the importance of technology-based resources and motivation as among the factors which influence the impact of soft skills and hard skills on improving English speaking among vocational college students in Nanchang, China.

Keywords: Soft Skills, Hard Skills, English-Speaking Proficiency, Technology-Based Resources, Motivation, College Students

Introduction

In today's globalized world, English proficiency has become a vital requirement for academic success, professional advancement, and international communication (Crystal, 1997). As the dominant global language, English is essential for college students seeking to participate in global education and cross-border employment. In response, China has integrated English instruction into its national curriculum. However, despite this nationwide effort, a significant gap in English language proficiency persists.

According to the Ministry of Education of China (2025), fewer than 1% of mainland Chinese citizens possess the ability to engage in basic English conversation. This deficiency is further reflected in the 2023 EF English Proficiency Index, which ranked China 82nd out of 113 countries globally, with a national score of 464, well below the global average of 502. Regionally, disparities are stark. While cities like Beijing (514), Shanghai (512), and Hangzhou (509) fall into the "moderate" proficiency category, others such as Chongqing (479), Guangzhou (475), and Suzhou (449) are classified as "low" or "very low" in English proficiency. These differences highlight the ongoing urban-rural divide in access to quality English education, with rural and underdeveloped regions facing limited resources, underqualified teachers, and early dropout from language instruction due to financial constraints. Compounding the issue is the widespread perception that English lacks relevance in daily life, particularly in non-metropolitan areas. Despite acknowledging the importance of English for global engagement, many Chinese learners remain disengaged, as their educational environments emphasize rote memorization over communicative competence. Students often perform well in reading and writing but struggle to speak fluently due to limited opportunities for authentic language use and a lack of supportive, interactive learning settings. These barriers underscore the urgent need for a more practical, skill-integrated approach to English language instruction in Chinese higher education.

English-speaking proficiency remains a significant challenge for Chinese university students and is consistently regarded as one of the most difficult language skills to master. A core issue contributing to this problem is the continued emphasis on rote memorization over the development of practical language use (Purmama, 2019). Classroom instruction typically prioritizes grammar drills and written examinations, offering minimal opportunities for real-life speaking practice. While many students recognize the value of English, especially for academic and professional advancement, they often lack opportunities to practice speaking outside the classroom (Ministry of Education of China, 2023). This results in a noticeable imbalance—students may perform well in reading and writing but struggle significantly with oral communication.

Contributing factors include shyness, real-time processing difficulties, and a lack of interactive environments or speaking partners. Studies by Peng (2014), Zhang (2022), and He (2013) highlight recurring obstacles to oral proficiency such as anxiety, timidity, limited cultural awareness, and foreign language speaking apprehension. These challenges are common across both English and non-English majors and contribute to a cycle of disengagement in which students gradually lose motivation due to the absence of meaningful language use. Moreover, Zhang (2022) emphasized the influence of verbal and non-verbal barriers, while He (2013) underscored the long-term impact of speaking anxiety on learners' oral proficiency. Even students who reach moderate fluency levels often experience regression when they lack

practical outlets for sustained use. This persistent gap between receptive and productive language skills illustrates an urgent need for a comprehensive, skills-integrated, and motivation-driven approach to English language education in Chinese universities—one that addresses both the cognitive and affective barriers to spoken language development.

On the other hand, the problems faced by the students in speaking English as a foreign language are the linguistics aspect such as lack of vocabulary, grammatical error and poor pronunciation and psychological aspect, such as lack of self-confidence, shyness, fear of making mistakes and being laughed at, anxiety, the interference of mother tongue language and lack of motivation to learn. Many English language learners in China find grammar complex and extremely difficult to learn. According to the British Council (2023 - 2025), China has experienced a steady decline in English language proficiency over recent years. The country's ranking on the English Proficiency Index fell from 38th in 2020 to 49th in 2021, and further dropped to 62nd in 2022, marking a shift from "moderate" to "low proficiency." By 2024, China remained in the "low proficiency" category but had fallen to 82nd place out of 111 countries—reflecting a troubling downward trend in national English language competence. Several factors have contributed to this decline. The COVID-19 pandemic disrupted English language learning and reduced opportunities for meaningful practice. In addition, the implementation of China's "double reduction" policy in 2022, which aimed to ease academic pressure by limiting after-school tutoring, further restricted access to supplementary English instruction. Compounding the issue is a growing perception that English proficiency holds decreasing value in China. This is evident in ongoing debates about reducing the prominence of English in the national curriculum, as well as in the relaxation of English language requirements for university admissions and course completion. Collectively, these developments point to a diminishing emphasis on English education in China, with potential long-term implications for students' global competitiveness.

Soft skills including communication strategies, empathy, and adaptability—are critical to authentic spoken interaction, yet they receive scant attention in China's largely exam-driven classrooms. Without training in turn-taking, active listening, and cultural sensitivity, students struggle to negotiate meaning in conversation or to employ pragmatic language functions, further stalling their oral development. Hard skills the foundational elements of grammar, vocabulary, and pronunciation—are regularly drilled but in isolation. This segmented focus often fails to translate into fluent speech, because students can recite rules or definitions without integrating them dynamically in conversation. The resulting disconnect between declarative knowledge and procedural speaking ability leaves learners unable to bridge theory and practice.

Recent studies suggest that technology-based resources can provide simulated communicative environments—through language-learning apps, online speaking workshops, and virtual exchange platforms—that foster both soft-skill practice (negotiation, turn-taking) and hard-skill reinforcement (pronunciation feedback, interactive drills). According to Shuoyan (2021) and Tian (2020) later highlighted the potential of network technology in improving English language learning, with Shuoyan specifically proposing an education platform based on network technology. Nguyen (2022) indicted that the use of technology can significantly impact the teaching and learning of speaking skills in English as a foreign language. These studies collectively suggest that technology-based resources can play a

moderating role in the influence of soft and hard skill on English-speaking proficiency among college students in Nanchang, China. Motivation—shaped by classroom atmosphere, instructor support, parental encouragement, and individual goals—consistently drives students' persistence in speaking tasks and their pursuit of extra practice (Soriano, 2021). Key motivational factors include a positive learning environment, enjoyment of the learning process, and intrinsic and extrinsic desires to master English. Ahmad (2021) underscores the need for heightened learner motivation to foster oral competence, while Lee (2011) demonstrates that genuine interest in the language significantly enhances speaking proficiency. Further confirm a strong, positive correlation between speaking ability and motivational intensity. Given the pivotal role of motivation in achieving English proficiency—especially for non-native contexts such as Chinese universities—its precise relationship with oral skills warrants deeper investigation. Accordingly, the present study explores how motivational factors, alongside technology-based resources, mediate the influence of both soft and hard skills on English-speaking proficiency among college students in Nanchang, China.

Together, technology and motivation may mediate the relationship between students' soft and hard speaking skills and their overall oral proficiency. The present study therefore examines how technology-based resources and motivational factors interact with both soft skills (communication, empathy, flexibility) and hard skills (grammar, vocabulary, pronunciation) to influence English-speaking proficiency among college students in Nanchang, China.

Below are the Research Questions:

- 1) What is the level of speaking skills among college students in Nanchang, China, according to China's Standards of English Language Ability?
- 2) What is the relationship between soft skills (communication, empathy, and flexibility) and English-speaking proficiency among college students in Nanchang, China?
- 3) What is the relationship between hard skills (grammar, vocabulary, and pronunciation) and English-speaking proficiency among college students in Nanchang, China?
- 4) Do technology-based resources and motivation moderate the relationship between soft and hard skills and English-speaking proficiency among college students in Nanchang, China?

Literature Review

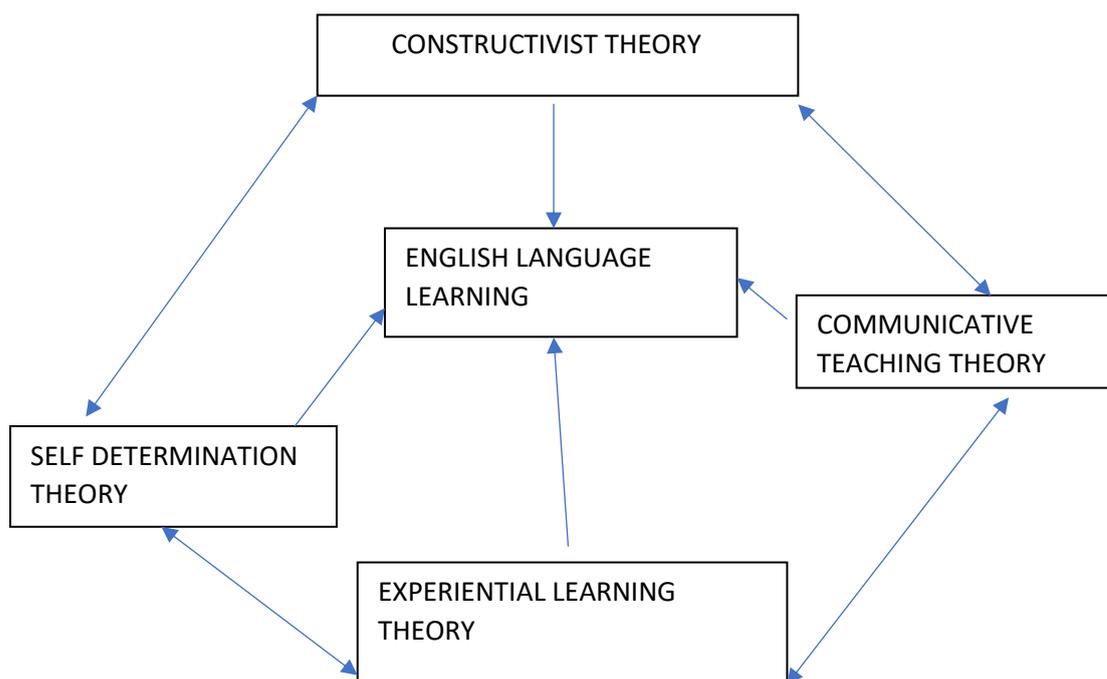
Recognising the persistent gap in English speaking proficiency, the Chinese government has intensified efforts to enhance English education, with a particular focus on oral skills. Over the past two decades, policy initiatives such as the *Standards of English Language Ability* and revisions to the National English Curriculum have shifted the emphasis from rote memorisation and grammar-translation methods toward communicative language teaching (CLT), task-based learning, and learner-centred approaches (Sang, 2023). These reforms aim to develop communicative competence, including listening, speaking, reading, and writing, prioritising real-world applicability over mere grammatical accuracy. Classroom practices now commonly incorporate pair and group discussions, role-plays, debates, and presentations to provide learners with structured opportunities to practice speaking in meaningful contexts.

Teacher-training programmes have been comprehensively restructured to support China's shift toward communicative and learner-centred English instruction. Both in-service and pre-service development initiatives now prioritise enhancing instructors' oral proficiency, intercultural competence, and pedagogical skills for facilitating interactive and collaborative classroom activities (Li & Chen, 2021). These programmes increasingly emphasise reflective teaching practices, classroom observation, and peer feedback to ensure that teachers can effectively implement communicative language teaching (CLT) and task-based learning approaches. In addition, professional development is progressively incorporating modern technologies to create more dynamic and immersive learning experiences. Computer-assisted language learning (CALL) platforms, online speaking forums, and mobile applications now allow students to practise English in semi-immersive or authentic virtual environments, often with immediate feedback and performance tracking. Some initiatives even integrate AI-powered speaking tutors, virtual role-play simulations, and gamified speaking exercises to reduce anxiety and promote sustained oral practice. By combining targeted teacher development with technology-enhanced learning tools, these reforms aim to expand instructional capacity, increase opportunities for meaningful communication, and ultimately improve students' speaking proficiency in both classroom and real-world contexts.

Pilot projects in various provinces have further introduced innovative approaches, such as bilingual immersion programs, collaborative school-enterprise partnerships, and English corners that encourage spontaneous conversation. These initiatives aim to reduce speaking anxiety, increase exposure to native and fluent speakers, and foster a positive affective environment conducive to oral practice (Wang & Zhang, 2022). Despite these efforts, challenges persist. Large class sizes, uneven teacher qualifications, and limited access to authentic English-speaking contexts outside the classroom continue to constrain students' oral proficiency development (Amoah & Yeboah, n.d.; PubMed, 2024).

Collectively, these reforms represent a comprehensive, long-term strategy aimed at aligning China's English education outcomes with international benchmarks and global standards. By systematically integrating policy reform, curriculum innovation, teacher professional development, and technology-supported learning, the initiatives not only target the improvement of students' linguistic competence but also seek to cultivate broader communicative and socio-cultural skills. Specifically, the reforms aim to enhance learners' confidence in using English in authentic settings, develop intercultural awareness necessary for global interaction, and strengthen the ability to engage effectively across academic, professional, and cultural contexts. In doing so, China positions its students to participate more competently and competitively in international education programs, cross-border professional opportunities, and multicultural exchanges, bridging the gap between domestic English instruction and global communicative demands.

Theoretical Framework



Experiential learning theory and constructivist theory are very closely related. In fact, experiential learning is often looked at as a specific application of constructivist principles. Both of these theories place great emphasize on the fact that learning is an active process. Individual learners construct their own understanding of what they learn through their experience. This means that while learning, the students are not receiving information passively. As stated by Davied Kolb, experiential learning focuses on learning through what they experienced directly. This is followed by their reflection on the experience. Both these theories suggested that the learners are not and will nut be empty vessels to be filled with knowledge and skill.

On the other hand, they are active participants who build their understanding of that they have learned based on their interaction with the environment. Besides that, both the theories are based on the fact that experience is central to learning. Experiential learning theory place importance on direct experience. Meanwhile, constructivism postulated that all learning by students is based on their previous experiences and also on how these students interpret their experience. Both these theories also place importance on reflection as a key component. From David Kolb's explanation, he said experiential learning theory includes reflective observation as a stage in the learning cycle. On the other hand, constructivist theory place importance on reflecting on the experience so that the students can understand the whole learning process. As a conclusion here, experiential learning can be taken as a practical framework for carrying out constructivist learning principles, especially in cases where direct experience and reflection are important to learning (Mughal and Zafar, 2024). This is especially useful in the learning of English language speaking.

Conceptual Framework

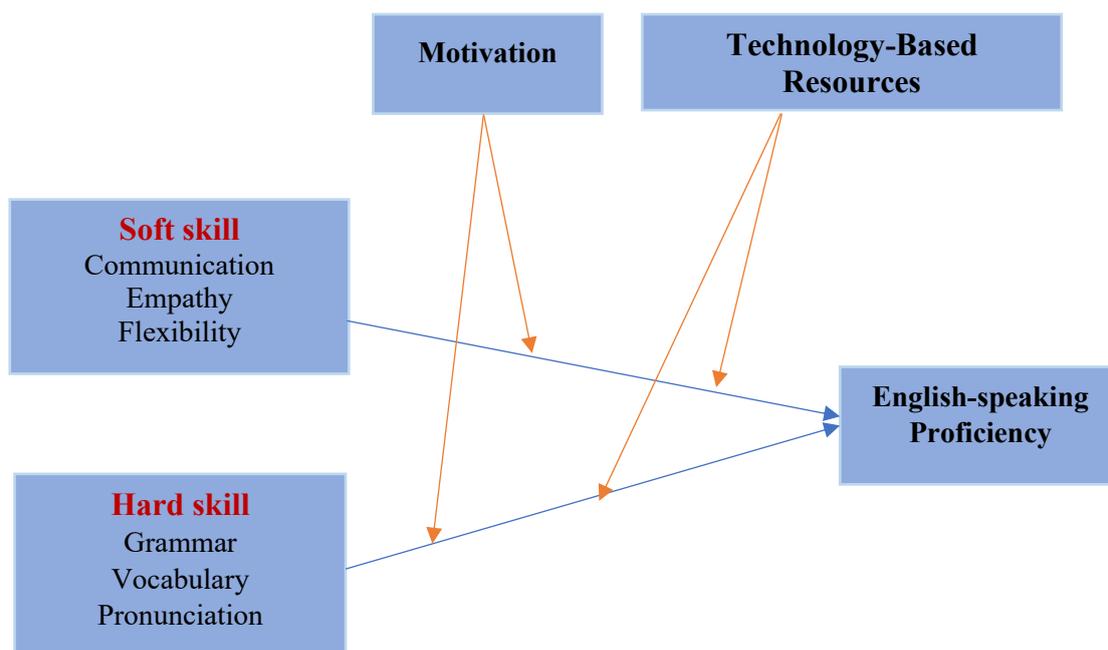


Figure 2: Conceptual Framework

Methodology

The methodology for this study follows a structured and rigorous quantitative framework. A deductive research approach was selected, beginning with established theories and hypotheses related to English-speaking proficiency and testing them using empirical data. This approach ensures a systematic evaluation of the influence of soft and hard skills on students' English performance, allowing for theory validation and prediction. A correlational research design was employed to examine natural relationships among variables—soft skills, hard skills, English proficiency, technology-based resources, and motivation—without manipulation. Statistical methods such as correlations and regressions were used to identify both direct and moderated effects, providing evidence-based insights for educational practices.

The study population consisted of college students in Nanchang, China, with the Nanchang Institute of Science and Technology chosen as the focal point. From a total population of 28,900 students across eight faculties, a sample size of 400 was determined using Krejcie and Morgan's formula and stratified random sampling to ensure proportional representation. The selection criteria included students in their 2nd and 3rd years, particularly those in tourism, nursing, and medical programs, given their high reliance on English proficiency for professional success. Stratified sampling improved representativeness, minimized bias, and ensured statistical validity across subgroups.

For data collection, a structured questionnaire was developed consisting of 67 items divided into demographics, hard skills, soft skills, English-speaking proficiency, technology-based resources, and motivation, measured on a 5-point Likert scale. A pilot study with 50 students established the instrument's validity and reliability, with Cronbach's Alpha values above 0.9 for all constructs, confirming internal consistency. Data screening procedures ensured

normality, removal of outliers, and accuracy before full analysis. The analysis used SPSS 28.0, applying descriptive statistics, correlation, multiple regression, and confirmatory factor analysis (CFA) to validate constructs and test hypotheses. This comprehensive methodology ensured reliability, ethical rigor, and robust findings aligned with the study objectives.

Results

The structural equation modeling has been taken into consideration for performing the main analysis in order to test the different research hypothesis and also indicating the relationship between different exogenous construct and the endogenous construct. The relationships that are depicted could be either direct or indirect. The structural model has been performed in this research study for the purpose of testing the model fit and the individual parts as well as for describing the coefficient of determination.

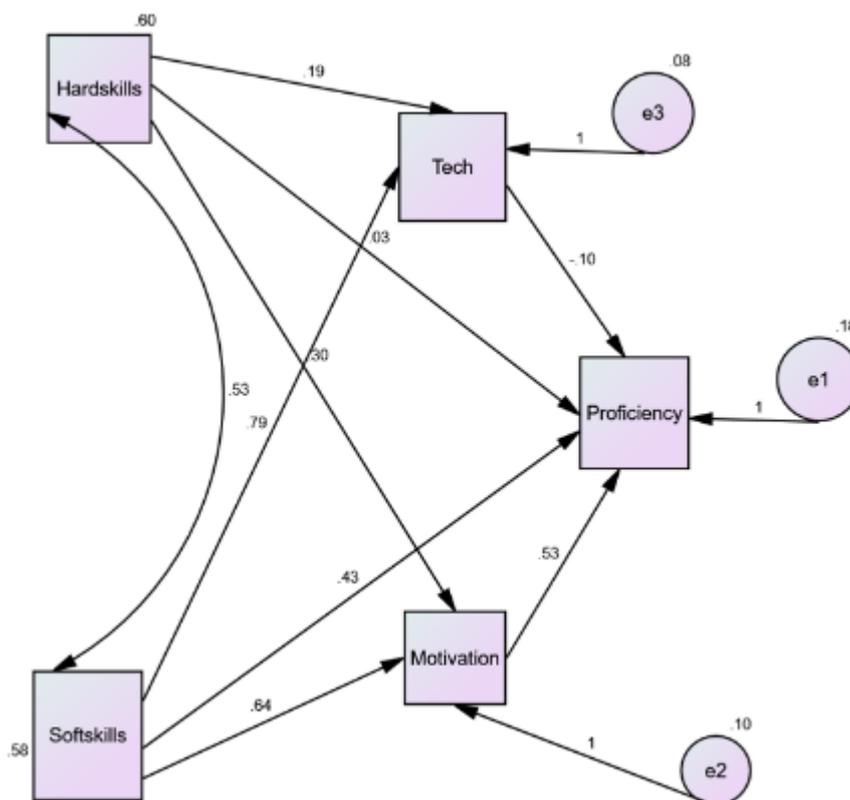


Figure 3: Structural Model

With a specific end goal to accomplish this target, the squared various connections (R^2) for every one of them were developed and each beta incentive for each auxiliary way was alluded nearly. A p-value greater than 0.05 is considered "not significant" and means that the null hypothesis is not rejected. This indicates that there is not a statistically significant deviation from the null hypothesis. To test H2 and H3, regression analysis is employed.

There is a positive relationship between soft skills (communication, empathy, and flexibility) and improving English-speaking proficiency of college students in Nanchang, China.

Refer to Table 4.11, soft skills to English-speaking Proficiency, Beta value 0.431, S.E. value 0.097, C.R. value 4.431, and P value 0.004 which is less than 0.05. Hypothesis 2 is "There is a positive relationship between soft skills (communication, empathy, and flexibility) and improving English-speaking proficiency of college students in Nanchang, China". From the analysis of the data, the hypothesis is supported. Therefore, Hypothesis 2 is accepted.

There is a positive relationship between hard skills (grammar, vocabulary, and pronunciation) and improving English-speaking proficiency of college students in Nanchang, China.

In the Table 4.11, hard skills to English-speaking Proficiency, Beta value 0.029, S.E. value 0.066, C.R. value 0.447, and P value 0.035 (less than 0.05) which is considered "significant". As a result, after analysing the data, Hypothesis 3 "There is a positive relationship between hard skills (grammar, vocabulary, and pronunciation) and improving English-speaking proficiency of college students in Nanchang, China", is supported. Therefore, Hypothesis 3 is accepted.

Regression weights

	Beta	S.E.	C.R.	P-Value	
Hard skills -----► Proficiency	.029	.066	.447	.035	Supported
Soft skills -----► Proficiency	.431	.097	4.431	.004	Supported

These results confirm that both soft and hard skills are positively associated with English-speaking proficiency, with soft skills showing a stronger predictive value. This has significant implications for curriculum design, emphasizing the need to integrate interpersonal and cognitive skill development alongside technical language instruction.

Discussion, Limitations, Implications and Recommendations

Khasinah (2014) said that educators who make up teachers and lecturers have been diligently trying to find ways to combat the challenging problems related to the improvement of the standard of the English language among Chinese students at all levels in general. Of particular seriousness is the problems faced when the Chinese students attempt to speak in the English language. This may be due to the inadequate classroom teaching and learning skills, limited daily use and practice of the English language, lack of interest in enhancing teaching capabilities, and an inability to be flexible when the teachers and lecturers are applying the teaching techniques, strategies and approaches during their interaction with the students (Gang Zhang and Hui Lu, 2024). This is just to name a few of the problems which were obtained from the numerous literature reviews. Due to these, English language teachers therefore face challenges when teaching the English language particularly when they attempt to get the students to speak (Budiman, 2023). Therefore, the objective of this study is to examine and discuss and find answers to the various objectives put forth in Chapter 1. It is also aimed to discuss the status of the assumptions made. The ultimate aim of this research activity is to provide a platform and basis so that further action can be taken to improve the speaking of the English language among Chinese students, particularly those in colleges and institutes of higher learning in China.

This study set out to investigate the influence of soft skills (communication, empathy, and flexibility) and hard skills (grammar, vocabulary, and pronunciation) on the English language speaking proficiency of college students in Nanchang, China. Additionally, it explored how technology-based resources and motivation moderated these relationships. Drawing data from 384 students across eight faculties within a selected college, the study used a validated and reliable questionnaire comprising 65 items. The findings from the data analysis, conducted using SEM-PLS, confirmed that both soft and hard skills significantly contribute to enhancing English-speaking proficiency. Furthermore, the moderating roles of technology-based resources and motivation were found to strengthen these relationships.

The study contributes to both theoretical and practical domains by proposing a pedagogical model for language instruction that integrates experiential learning theory, constructivist pedagogy, and 21st-century digital tools. The recommendation to develop a Classroom Teaching and Learning Skills Module serves as a tangible output of the research. This module is designed to support beginning and pre-service teachers as well as in-service educators by equipping them with essential teaching competencies, particularly in the area of speaking skills. The blended and hybrid teaching models advocated in this research present a flexible, personalized, and interactive framework for English language education. These approaches leverage technology to enhance learner engagement, autonomy, and communication effectiveness both in and out of the classroom. The integration of experiential learning cycles into the module ensures that learners not only acquire theoretical knowledge but also develop practical teaching and language skills through hands-on experience and reflective practice.

References

- Abbasi, M. H., Siddiqi, A., & Azim, R. U. A. (2011). Role of effective communications for enhancing leadership and entrepreneurial skills in university students. *International Journal of Business and Social Science*, 2(10).
- Abu-Hamour, B., & Al-Hmouz, H. (2013). A study of gifted high, moderate, and low achievers in their personal characteristics and attitudes toward school and teachers. *International Journal of Special Education*, 28, 5–15.
- Abu-Hamour, B., & Al-Hmouz, H. (2013). The relationship between students' interest and achievement in English language learning. *International Journal of Learning, Teaching and Educational Research*, 2(1), 34–45.
- Akcan, S., & Tatar, S. (2010). An investigation of the nature of feedback given to preservice English teachers during their practice teaching experience. *Teacher development*, 14(2), 153–172.
- Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*, 19(6), 716–723.
- Alizedah, M. (2016). The Impact of Motivation of English Language Learning. Islamic Azad University: Iran.
- Al-khresheh, M. H., Demirkol Orak, S., & Alruwaili, S. F. (2025). *The development of language proficiency through global skills enhancement using Web 2.0 tools in university EFL contexts: A mixed-methods quasi-experimental study*. Humanities and Social Sciences Communications, 12(1), 931. <https://doi.org/10.1057/s41599-025-05210-2>
- Ali, R., & Hassan, N. (2021). Factors influencing English language proficiency among university students in multilingual contexts. *Journal of Language and Education*, 7(3), 45–60. <https://doi.org/10.5430/jle.v7n3p45>
- Al Zoubi, S. (2018). The impact of exposure to English language on language acquisition. *Journal of Applied Linguistics and Language Research*, 5(4), 157–168.
- Alvarez, G. (2023). *Latin's Role in the Development of the English Language: How historical events changed the English language forever, and How Latin is Presented in the Modern English*.
- Al-Sibai, D. (2004). Promoting Oral fluency of Second Language Learners: Educational Linguistics. Department of English. King Saud University.

- Amini, A., Gabriel, S., Lin, S., Koncel-Kedziorski, R., Choi, Y., & Hajishirzi, H. (2019). *MathQA: Towards Interpretable Math Word Problem Solving with Operation-Based Formalisms*, 2357-2367. <http://doi.org/10.18653/v1/N19-1245>
- Amoah, S., & Yeboah, J. (n.d.). The speaking difficulties of Chinese EFL learners and their motivation towards speaking the English language. *Journal of Language and Linguistic Studies*. <https://www.jlls.org/index.php/jlls/article/view/2394>
- Anel B. Serik, Kassymova, G. K., Kosbay, S. D., Kalimoldaeva, A. K., & Dzhambulova, Z. (2024). Relationship between soft skills and language learning. *Muallim Journal of Social Sciences and Humanities*, 8(3), 39–50. <https://doi.org/10.33306/mjssh/284>
- Andrews, J., & Higson, H. (2008). Graduate employability, 'soft skills' versus 'hard' business knowledge: A European study. *Higher Education in Europe*, 33(4), 411–422.
- Ang, S., Van Dyne, L., Koh, C., Ng, K. Y., Templer, K. J., Tay, C., & Chandrasekar, N. A. (2007). *Cultural intelligence: Its measurement and effects on cultural judgment and decision making, cultural adaptation and task performance*. *Management and Organization Review*, 3(3), 335–371. <https://doi.org/10.1111/j.1740-8784.2007.00082.x>
- Apsari, Y. (2017). THE USE OF PICTURE SERIES IN TEACHING WRITING RECOUNT TEXT. *ELTIN JOURNAL, Journal of English Language Teaching in Indonesia*, 5(2), 51-56.
- Arnold, J. (2000). *Affect in language learning*. Cambridge: Cambridge University Press
- Arpentieva, M.R., Retnawati, H., Akhmetova, T.A., Azman, M.N.A., Kassymova, G.K. (2021). Constructivist approach in pedagogical science. *Challenges of Science*. Issue IV, 2021, pp. 12-17. <https://doi.org/10.31643/2021.02>
- Atilgan, T., & Bozdogan, H. (1987, June). Information-theoretic univariate density estimation under different basis functions. *A paper presented at the First Conference of the International Federation of Classification Societies*, Aachen, West Germany.
- August, D. (2018). Educating English language learners: A review of the latest research. *American Educator*, 42(3), 4.
- Azar, Ali & Tanggaraju, Darshini (2020). Motivation in Second Language Acquisition among Learners in Malaysia. *Studies in English Language and Education*. 7. 323 – 333. 10.24815/siele.v7i2.16506.
- Babu, R. (2010). Teaching Spoken English for Non-native Students: Problems, Solutions and techniques. [Online] Available: <http://www.eltweekly.com/elt-newsletter/2010/06/60-articleteaching-spoken-English-for-non-native-students-problems-solutions-and-techniques-by-a-rameshbabu/>. (March 15, 2011)
- Baker, J., & Westrup, H. (2003). *Essential speaking skills: A handbook for English language teachers*. Continuum.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W.H. Freeman.
- Bandura, A. (1977). *Social learning theory*. Prentice Hall.
- Bates, T., (1995). *Technology, Open Learning and Distance Education*, London Routledge.
- Bates, T., (2008). *Managing Technological Change*, (San Fransisco: Jossey-Boss Inc. 2000)
- Bell, D., Morrison-Love, D., Wooff, D. & McLain, M. (2017). STEM education in the twenty-first century: Learning at work-an exploration of design and technology teacher perceptions and practices. *International Journal of Technology and Design Education*, <https://doi.org/10.1007/s10798-017-9414-3>
- Bendarkawi, J., Ponce, A., Mata, S., Aliu, A., Liu, Y., Zhang, L., Liaqat, A., Rao, V. N., & Monroy-Hernández, A. (2025). *ConversAR: Exploring embodied LLM-powered group conversations in augmented reality for second language learners*. *arXiv*. <https://arxiv.org/abs/2505.24000>

Bhatti, M. A., & Basri, W. (2024). English proficiency and tacit knowledge transfer: Investigating mediating and moderating effects in multicultural workplaces. *International Journal of Management Education*, 22(2), 101–115. <https://doi.org/10.1016/j.ijme.2024.100832>