

Challenges and Difficulties in Chinese Sign Language Learning Among Pre-service Special Education Teachers Through Deaf Peer-Assisted Learning

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ABSTRACT:

With the development of inclusive education, pre-service special education teachers need adequate Chinese Sign Language (CSL) communication skills. However, limited research has examined the difficulties faced by pre-service teachers in learning CSL, particularly in real teaching contexts involving deaf peer-assisted learning. This qualitative study involved 10 pre-service special education teachers and 5 deaf university students. Data were collected through 20 pre-service teachers' interviews, 5 deaf peer interviews, and 8 classroom observations across two cycles of action research and analysed using thematic analysis. The findings identified nine persistent difficulties: insufficient vocabulary and contextual expression, difficulties in converting Chinese-style expressions into sign language grammar, limited ability to organize long and continuous expressions, unstable spatial orientation, unfamiliarity with classifiers, insufficient use of non-manual features, limited natural sign language interaction skills, inadequate communication repair strategies and reliance on text, and expression anxiety and low confidence. The findings suggest that the major challenge in CSL learning is not simply a lack of vocabulary or grammar, but a significant transfer gap between classroom learning and authentic communication. This study contributes to research on CSL learning among pre-service special education teachers and provides practical implications for optimizing deaf peer-assisted learning.

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1. Introduction

- Introduce the research topic and context

In recent years, with the continuous advancement of inclusive education and the implementation of policies such as the "Law of the People's Republic of China on the Construction of

Barrier-Free Environments", special education teachers have assumed increasingly important communication and support responsibilities. For pre-service special education teachers who will be engaged in hearing-impaired and inclusive education in the future, Chinese Sign Language is not only a professional skill but also an important

medium connecting the deaf and hearing communities. A teacher's proficiency in using Chinese Sign Language directly affects the quality of classroom teaching, the effectiveness of teacher-student interaction, and the learning experience of deaf students.

Despite my country's continuous efforts in recent years to promote the national universal sign language and train special education teachers, existing research generally points out that many pre-service special education teachers, while possessing a certain vocabulary in sign language, still struggle to express themselves naturally, fluently, and accurately in real-life communication situations (Hua et al., 2023; Liu, 2025; Wang & Tang, 2023; Zhou Zhai, 2020). This phenomenon shows that Chinese sign language learning is not just a process of vocabulary accumulation, but involves the development of visual-spatial language organization, non-manual features, discourse construction, cultural understanding, and real interaction abilities.

At the same time, in recent years, an increasing number of studies have begun to emphasize the important role of authentic communication environments in sign language learning (Liu, 2024; Lu, 2015; Zhang et al., 2021; Zhao, 2018). Compared to traditional teacher demonstrations, deaf individuals, as native or dominant users of Chinese Sign Language, can not only provide natural language input but also help learners understand deaf cultural contexts, expressive logic, and authentic communication strategies. Therefore, the Deaf Peer-Assisted Learning Approach has gradually become an important area of exploration in special education teacher training. However, current research on Deaf Peer-Assisted Learning focuses more on its facilitating effects and less on the persistent difficulties learners still face after the introduction of deaf peers, and how these difficulties change as teaching activities progress. In fact, as learners gradually move from classroom imitation to authentic communication, the focus often shifts from vocabulary memorization to language organization, interactive understanding, and

communication repair, meaning that learning difficulties may exhibit new characteristics.

- State the problem and research objectives

Based on this, this study, grounded in two cycles action research, systematically explores the persistent difficulties and changing processes of pre-service special education teachers in learning Chinese Sign Language through a comprehensive analysis of classroom observations, pre-service teacher interviews, and interviews with deaf peers. Furthermore, it analyzes the mechanism by which peer-assisted learning approach promotes Chinese Sign Language learning.

This study primarily answers the following two research questions:

RQ1: What difficulties and challenges do pre-service special education teachers still face in learning Chinese Sign Language during deaf peer-assisted learning?

RQ2: As the deaf peer-assisted learning approach continues to be implemented, how do these learning difficulties change, and what are the underlying mechanisms?

- Provide a brief review of relevant literature

Chinese Sign Language Learning among Pre-service Special Education Teachers.

The training of special education teachers in China is gradually shifting from a knowledge-oriented to a competency-oriented approach. Teachers not only need to master special education theory but also possess practical communication skills to serve hearing-impaired students. Against this backdrop, the sign language learning problem for pre-service special education teachers presents a highly consistent focus in international and Chinese studies: insufficient practical skills and lack of authentic context constitute the core bottlenecks in the current learning process. International research has verified the universality of this problem from different educational contexts. Manogna et al (2021) found in a survey of pre-service special education teachers in India that although some

theoretical knowledge support is provided in teaching, there is still a significant lack of training in sign language application, behavioral support and practical skills, reflecting a structural imbalance in the teaching system that is "strong in theory and weak in practice". Similarly, Alawajee et al. (2022) pointed out in their study in Saudi Arabia that current sign language courses mainly focus on grammar instruction and vocabulary memorization, while lacking communicative training in real-world contexts and standardized tools for effectively assessing the learning process. Beal (2020) also proposed that learners' language performance is not only affected by motivation and learning frequency, but more importantly, by the lack of real communicative environments.

In the Chinese context, the above problems also exist significantly, and are more specifically manifested in the curriculum structure and teaching practice. Luo Xiao (2016) pointed out that sign language teaching in vocational college special education majors still focuses on vocabulary memorization and gesture imitation, lacking training in communicative functions. Ren and Zhang (2015) further found that some newly established undergraduate colleges lack systematic and progressive curriculum design, resulting in a fragmented learning process.

Overall, both internationally and in the Chinese context, sign language instruction by pre-service special education teachers generally suffers from a common problem: an overemphasis on knowledge transmission and a neglect of the development of authentic communicative competence. This structural limitation, to some extent, hinders learners' transition from "language mastery" to "language application."

In response to this problem, some studies in recent years have begun to explore improvement paths centered on "real-world context and multimodal interaction". Zhang and Liu (2021) and Liu (2024) proposed that extending the classroom to special education schools or introducing deaf people into teaching can provide learners with more authentic language input and interaction opportunities, thereby promoting the

development of communicative competence. This practice emphasizes making up for the shortcomings of traditional classrooms through contextualized learning.

Challenges in Learning Sign Language

Existing research generally agrees that learning sign language as a second language faces the following main challenges.

First of all, vocabulary learning is not the same as language expression ability. Although learners can master a large vocabulary of sign language, sign language is essentially a communicative language, and in real-life situations, learners often struggle to quickly organize their vocabulary to complete continuous expressions (Alajlan, 2017; Al-Fityani & Padden, 2010)

Secondly, visual-spatial grammar is the most challenging aspect of sign language learning. Spatial location, action paths, referential relationships, and the use of classifiers all contribute to the accuracy and naturalness of expression. Without learning about deaf culture, pre-service teachers struggle to develop a deep understanding of the grammatical rules of sign language, a visual-spatial language (Luo, 2016).

Third, the ability to Authentic Communication is also a significant challenge for learners. Existing research indicates that there are certain differences between standard classroom expressions and the everyday natural sign language of deaf people. Learners often experience comprehension difficulties when communicating with real people due to variations in speech rate, differences in expression habits, and regional variations in sign language (Peng & Zhang, 2018; Wang & Tang, 2023; Zhou, 2020).

Deaf Peer-assisted Learning in Sign Language Education

Peer assisted learning is also referred to as peer tutoring and has been applied in different ways in different higher education institutions. Peer tutoring is a system whereby learners help each other and learn by teaching (Ginty & Harding, 2014). This method emphasizes that learners construct knowledge together through collaborative interaction. In recent years, this

concept has been gradually applied to the field of sign language education, and has formed a peer-assisted learning approach for deaf people. Unlike conventional peers, deaf peers not only provide learning support but also assume multiple roles, including natural language input provider, cultural interpreter, immediate feedback provider, and real communication partner. Existing research indicates that deaf peers can help learners reduce rote imitation, improve natural expression skills, and enhance learning confidence. However, the timing of peer intervention, feedback methods, and the division of roles in the classroom still warrant further investigation (Han, 2024; Zhou, 2020).

Research Gap

In summary, existing research has adequately discussed the general difficulties in learning sign language and the positive effects of the deaf peer-assisted learning approach but three shortcomings remain. First, existing research primarily employs cross-sectional study designs, lacking continuous tracking of the dynamic changes in learning difficulties. Second, research subjects mainly focus on deaf students, sign language interpreters, or general second language learners, with insufficient attention paid to the special needs group of pre-service special education teachers. Third, current research focuses more on the positive effects of the deaf peer-assisted learning approach, while exploring how learning difficulties persist and change in real-world teaching practice, and how deaf peers influence learning mechanisms rather than just learning outcomes. Therefore, this study, through two-cycle of action research, continuously tracks the difficulties and challenges faced by pre-service special education teachers in learning Chinese Sign Language, aiming to enrich the theory of Chinese Sign Language teaching and provide a more scientific practical basis for the training of special education teachers.

2. Methodology

- **Design:** Describe study design (qualitative, quantitative, mixed)

This study employs a two-cycle action research approach combined with qualitative research to

continuously track the difficulties and changes faced by pre-service special education teachers in learning Chinese sign language, and to explore the impact of the Deaf Peer-assisted Learning Approach on the learning process. Action research emphasizes that researchers continuously go through four stages—planning, action, observation, and reflection—in a real teaching environment to promote teaching improvement and a deeper understanding of the learning process. Compared to experimental research, action research is more suitable for the continuous exploration of complex teaching problems in educational contexts. This study uses a Chinese sign language curriculum as a vehicle to gradually introduce deaf peer-assisted learning in two consecutive teaching cycles, observing the trajectory and formation mechanism of learning difficulties. The first cycle of action research focused on identifying difficulties pre-service teachers face in learning Chinese Sign Language in traditional classrooms and designing subsequent teaching intervention programs accordingly. Building on the first cycle, the second cycle of action research formally introduced deaf university students as classroom peers into teaching activities. These students participated in classroom learning through natural sign language demonstrations, authentic communication, immediate feedback, and cultural explanations to further observe whether learning difficulties changed and how deaf peers influenced the learning process.

This study does not primarily aim to verify the effectiveness of a particular teaching model, but rather focuses on how learning difficulties evolve as teaching activities progress and to explore key mechanisms that promote the learning of Chinese Sign Language.

- **Participants/Sample:** Include sample size, selection criteria

This study was conducted within a special education program at a university, specifically in the course “Chinese Sign Language,” and lasted for two action research cycles. The study participants included 10 pre-service teachers majoring in special education and 5 deaf

university students with good Chinese Sign Language skills. All 10 pre-service teachers had completed basic Chinese Sign Language courses and possessed a certain vocabulary, but lacked real-world experience communicating with deaf individuals. The 5 deaf university students had long-term experience using Chinese Sign Language in daily communication, were proficient in natural sign language, and were willing to participate in classroom demonstrations, interactions, and feedback activities. During the study, the teachers were responsible for lesson design, knowledge delivery, and learning task organization; the deaf peers primarily served as natural sign language demonstrators, communicators, immediate feedback providers, and cultural interpreters, forming a classroom learning support system together with the teachers.

- **Instruments:** Tools, tests, or questionnaires used

This study employed two qualitative data collection instruments: Classroom Observation Records and Semi-Structured Interview Protocols. The classroom observation records were used to systematically document pre-service special education teachers' Chinese Sign Language learning performance and difficulties during the two cycles of action research. The observations focused on vocabulary use, sign language grammar, spatial expression, classifiers, non-manual features, natural sign language comprehension, authentic interaction, communication repair, and classroom participation. The semi-structured interview protocols were used to explore participants' learning experiences, perceived difficulties, changes in learning, and perceptions of Deaf Peer-Assisted Learning. Interviews were conducted with both pre-service special education teachers and deaf university students. The two instruments provided complementary sources of qualitative data and enabled the researcher to compare observed learning behaviours with participants' reported experiences, thereby strengthening the credibility of the findings through data triangulation.

- **Procedure:** Step-by-step description of how the study was conducted

To comprehensively understand the learning process, this study employed a multi-source data collection strategy (data triangulation), comprehensively utilizing various data sources including classroom observation, semi-structured interviews, and research reflection.

The first round of action research collected 10 pre-service teacher interviews and 4 classroom observation records, focusing on analyzing students' learning difficulties in traditional Chinese sign language classes.

The second round of action research collected 10 pre-service teacher interviews, 5 interviews with deaf university students, and 4 classroom observation records, focusing on examining learning changes, persistent difficulties, and classroom interaction after the implementation of peer-assisted learning.

Classroom observations continuously recorded students' vocabulary usage, sign language grammar, spatial expression, use of classifier, non-manual features, natural sign language comprehension, authentic interaction, and classroom participation. Interviews focused on understanding students' subjective experiences during the learning process, learning difficulties, evaluations of peer-assisted learning, and subsequent learning needs.

By cross-referencing different data, the credibility and completeness of the research results were improved.

- **Data Analysis:** Statistical or qualitative analysis methods

This study uses thematic analysis proposed by Braun and Clarke (2006) for data analysis.

First, all interview recordings were transcribed verbatim and combined with classroom observation records to form a complete textual dataset.

Second, researchers repeatedly read the entire text, using open coding to identify key content reflecting learning difficulties, changes in learning, and classroom interactions.

Subsequently, codes with similar meanings were further integrated to form primary and secondary themes, and continuously compared and revised with the original data to ultimately form a complete thematic framework.

The first cycle of action research identified nine learning difficulty themes, including:

- Insufficient vocabulary and contextual expression reserves
- Difficulty in converting between Chinese-style expressions and sign language grammar
- Difficulty in constructing long sentences
- Unstable spatial expression
- Insufficient use of classifier
- Insufficient non-manual features
- Insufficient understanding of natural sign language
- Insufficient communication repair strategies
- Expression anxiety and lack of confidence

The second cycle of action research, while retaining the above themes, further analyzed the changes in learning difficulties and the role mechanism of peer-assisted learning for deaf individuals, and finally integrated them into four higher-order themes.

- a) Persistent Linguistic Challenges;
- b) Visual-Spatial Challenges;
- c) Challenges in Authentic Communication;
- d) Transformation of Learning Challenges through Deaf Peer-Assisted Learning

3. Results

3.1 Theme 1. Persistent Linguistic Challenges: Difficulties Beyond Vocabulary Learning

The findings showed that although pre-service special education teachers acquired a certain amount of Chinese Sign Language (CSL) vocabulary across the two action research cycles, their overall language proficiency did not develop at the same rate. The main difficulty was not memorising individual signs, but using known

vocabulary to construct coherent expressions during communication.

Classroom observations showed that most participants were able to imitate short sentences after teacher demonstrations. However, when they were required to tell a story, conduct a simulated teaching activity, or describe a sequence of events, they frequently demonstrated pauses, repetitions, and inappropriate word order. These difficulties were observed across both cycles.

Interview data further supported these observations. Several participants reported that they knew many signs but had difficulty connecting them into complete expressions. One participant stated:

“I know many signs, but I don’t know how to connect them into complete sentences.” (A7)

Another participant explained:

“When I organise a long sentence, I often think about each word separately, so my signing becomes very slow.” (A10)

Participants also reported that they were influenced by Chinese sentence structure when producing CSL. They tended to translate Chinese expressions word by word rather than independently organising their signing.

Overall, the data showed that vocabulary acquisition occurred during the two cycles, but difficulties remained in sentence organisation, continuous expression, and the use of vocabulary in connected discourse.

3.2 Theme 2. Persistent Visual-Spatial Challenges: Spatial Grammar, Classifiers, and Non-manual Features

The findings also revealed persistent difficulties in the visual-spatial aspects of CSL, particularly spatial orientation, classifiers, and non-manual features. Although participants were able to perform basic signs, difficulties remained when they needed to coordinate spatial location, movement direction, body position, and facial expression during continuous signing.

Classroom observations showed that participants frequently experienced difficulties when describing the location of people or objects, spatial relationships, and movement paths. Common problems included inconsistent spatial positioning, incorrect movement direction, and unclear shifts between different referents.

One participant stated:

“I know where the movement should be placed, but when I am signing and speaking at the same time, I easily forget where I placed it before.” (A7)

Another participant explained:

“If the teacher teaches me one sentence, I can follow it. But when I tell a story by myself, I don't know where to place the characters.” (A2)

Difficulties with classifiers were also observed. During cycle 1, most participants could recognise some commonly used classifiers but had difficulty selecting and applying appropriate classifiers during independent signing. During cycle 2, participants demonstrated improved recognition of classifiers after interaction with deaf peers; however, classroom observations still showed difficulties when participants encountered new situations that required independent use of classifiers.

Non-manual features presented another persistent difficulty. Although participants were exposed to facial expressions, eye gaze, mouth movements, and body posture during classroom activities, their performance continued to focus primarily on hand movements. Video observations showed that some participants used limited facial expression, eye gaze, and body movement, resulting in less coordinated signing.

Deaf peer observations and interactions also provided evidence of participants' difficulties with spatial positioning and non-manual features. Deaf peers frequently responded to participants' signing through repetition, facial expressions, movement adjustments, or other visual feedback.

Overall, the data indicated that difficulties in spatial orientation, classifiers, and non-manual

features persisted across the two cycles, although some improvement was observed during cycle 2.

• 3.3 Theme 3. Challenges in Authentic Interaction: From Understanding Signs to Achieving Meaningful Communication

A further finding concerned participants' difficulties in authentic interaction. During cycle 1, participants frequently identified insufficient vocabulary and unfamiliarity with sign movements as their main learning difficulties. However, during cycle 2, when interaction with deaf peers became more prominent, difficulties in understanding and producing natural CSL became more evident.

Classroom observations showed that participants generally performed better when following teacher demonstrations. However, when interacting with deaf peers, some participants experienced greater difficulty understanding continuous and natural signing. They could identify individual signs or keywords but sometimes struggled to understand the overall meaning of an utterance.

One participant stated:

“The teacher signs more slowly and clearly. When I communicate with deaf students, they sign more naturally and quickly, so I can often understand only a few signs.” (A3)

Participants also demonstrated difficulties in communication repair. When they could not understand an expression or were unable to express themselves, they frequently relied on mobile phones, written Chinese, or assistance from the teacher. Fewer participants independently used CSL-based repair strategies such as repetition, rephrasing, clarification, spatial reference, or alternative expressions.

Observations of deaf peer interactions showed that deaf peers frequently responded to communication breakdowns through repetition, questioning, alternative expressions, and facial cues. These interactions provided participants with opportunities to identify misunderstandings and modify their expressions during communication.

Overall, the findings showed that participants experienced greater difficulties when moving from teacher-guided signing to natural interaction with deaf peers. These difficulties involved both understanding natural CSL input and maintaining meaningful communication.

• 3.4 Theme 4. Transformation of Learning Challenges Across the Two Cycles: From Classroom Imitation to Authentic Communication

Comparison of the two action research cycles revealed a noticeable change in the nature of participants' learning difficulties.

During cycle 1, participants' difficulties were mainly associated with vocabulary learning, accuracy of sign production, and following teacher demonstrations. Classroom observations showed that participants frequently focused on reproducing the signs presented by the teacher and completing the required signing tasks.

During cycle 2, participants had more opportunities to communicate with deaf peers. As a result, difficulties related to authentic communication became more visible. Participants increasingly encountered problems with understanding natural signing, organising continuous expressions, maintaining interaction, and repairing communication breakdowns.

One participant reflected:

“Before, I thought that if I could follow the teacher and do the signs correctly, I had learned them. But after communicating with deaf people, I realised that sometimes they couldn't understand me, and I couldn't understand them either.” (A4)

Another participant stated:

“The biggest change was not that I learned more signs, but that I realised I didn't know how to communicate.” (A1)

The role of deaf peers also changed across the two cycles. During the earlier stage, participants tended to view the deaf peer primarily as a model for correct signing. During the later stage, they

increasingly interacted with deaf peers as communication partners.

Interview data from deaf peers supported this change. One deaf peer stated:

“If students wait for me to demonstrate at the beginning, they only memorise the movements. Only when they try signing first can I know what they really don't know.” (B3)

The classroom observations further showed a gradual increase in participants' independent attempts before receiving feedback from deaf peers. This resulted in a more visible sequence of attempting, receiving feedback, revising, and re-expressing during cycle 2.

Overall, the comparison between the two cycles showed a shift in the nature of learning challenges: participants moved from primarily experiencing difficulties with vocabulary and sign-form accuracy in cycle 1 to experiencing more complex difficulties related to authentic communication in cycle 2.

4. Discussion

This study, based on two cycles of action research, systematically explored the difficulties faced by pre-service special education teachers in learning Chinese sign language and their dynamic changes after the intervention of deaf peer-assisted learning. Unlike existing research that primarily focuses on learning outcomes, this study pays greater attention to the developmental process of learning difficulties and attempts to explain how deaf peers influence learning mechanisms. The findings not only validate some existing conclusions regarding second language sign language learning but also propose new theoretical explanations, possessing theoretical and practical significance for Chinese sign language teaching and special education teacher training.

• 4.1 Chinese Sign Language Learning Is More Than Vocabulary Acquisition

Existing research on second language learning generally agrees that the development of language proficiency depends not only on the accumulation of language knowledge, but also on

learners' continuous construction of meaning in authentic contexts (Fu & Xu, 2018; Jia et al., 2013; Yin, 2016). This study further demonstrates that this principle also applies to the learning of Chinese Sign Language.

In the first cycle of action research, most pre-service teachers attributed their learning difficulties to insufficient vocabulary and hoped to improve their expressive abilities by memorizing more sign language words. However, the second cycle of action research showed that even if pre-service teachers had mastered a large vocabulary, they still struggled to achieve natural and coherent communication. This indicates that vocabulary learning is only the foundation of Chinese Sign Language learning, not the ultimate goal.

As a visual-spatial language, Chinese Sign Language relies on spatial construction, movement direction, non-manual features, and interactive context to express meaning. Therefore, learners not only need to master vocabulary but also develop visual-spatial thinking and discourse organization skills. This study found that the biggest challenge for pre-service teachers is not "not knowing how to use sign language," but rather "not knowing how to use sign language to express meaning." This finding further enriches research on Chinese Sign Language as a second language.

- 4.2 Deaf Peer-Assisted Learning changes the learning process rather than simply improving learning outcomes

Existing research generally suggests that deaf peers can provide natural language input, increase learning interest, and promote learning motivation (Liu, 2024; Ren & Zhang, 2015; Zhou, 2020). However, this study found that the value of peer-assisted learning for deaf people is not only reflected in improved learning outcomes, but more importantly, in changing the learning process itself.

In traditional classrooms, pre-service teachers primarily rely on teacher demonstrations to complete learning tasks, and classroom evaluation standards mainly focus on whether the actions are performed correctly. This model helps

pre-service teachers master basic language knowledge, but it can easily lead to learning remaining at the level of imitation.

As deaf peers enter the classroom, the learning environment gradually shifts from "knowledge transmission" to "meaning negotiation." Pre-service teachers no longer focus solely on whether the movements are correct, but begin to pay attention to whether the students truly understand their expressions. When communication barriers arise, they need to constantly adjust their expressions and try using different sign language resources to construct meaning. This process reflects the sociocultural theory's emphasis on "learning occurring through social interaction," and also illustrates that authentic interaction is a crucial condition for promoting the development of sign language proficiency in China (Lantolf, 2000).

Meanwhile, this study found that the optimal role of deaf peers is not as classroom demonstrators, but rather as communication partners, immediate feedback providers, and cultural interpreters. When pre-service teachers first attempt to express themselves and then receive feedback from their deaf peers, their ability to independently organize language and reflect is significantly enhanced. Conversely, if deaf peers prematurely demonstrate standard expressions, pre-service teachers are prone to developing dependency and reducing independent thinking. This finding further illustrates that peer-assisted learning for deaf individuals should emphasize the interactive process rather than simply providing standard answers.

- 4.3 Authentic Communication Is the Core Challenge in Chinese Sign Language Learning

Another important finding of this study is that learning difficulties have changed significantly with the development of teaching methods. In the first cycle of action research, pre-service teachers focused more on vocabulary, grammar, and motor skills; in the second cycle, while these basic difficulties still existed, the focus gradually shifted to natural sign language comprehension,

authentic interaction, and communication repair strategies.

This change indicates that Chinese Sign Language learning has essentially undergone a transformation from “language knowledge learning” to “communicative competence development.” Standardized expressions in the classroom can help pre-service teachers establish basic language structures, but authentic communication requires learners to continuously adjust their expression strategies based on the communicators, communication contexts, and interactive feedback. Therefore, only by entering authentic communication environments can learners truly realize their own language deficiencies and gradually develop communicative competence.

This finding is highly consistent with the “Negotiation of Meaning” concept in second language acquisition theory (Masrizal, 2014). Authentic communication not only provides rich natural language input but also prompts learners to complete language development through continuous revision of their expressions. Therefore, Chinese sign language courses should place greater emphasis on authentic communication tasks, rather than simply relying on classroom imitation.

• 4.4 The Classroom-to-Authentic Communication Transfer Gap

Based on the findings of two cycles of action research, this study proposes the concept of the “Classroom-to-Authentic Communication Transfer Gap”.

The so-called transfer gap refers to the situation where learners are able to complete teacher demonstrations and structured exercises in the classroom environment, but struggle to effectively transfer the language knowledge acquired in the classroom to natural communication in real-life situations. This gap mainly manifests as insufficient understanding of natural sign language, a lack of communication repair strategies, unstable spatial expression, and communication anxiety (Lantolf, 2000; Masrizal, 2014).

This finding further illustrates that the difficulties in learning Chinese Sign Language do not simply stem from a lack of language knowledge, but rather from the gap between classroom learning and authentic language use. Therefore, Chinese Sign Language curriculum design should place greater emphasis on authentic communication experiences, helping students gradually bridge the transfer gap between classroom learning and real-world communication through peer-assisted learning with deaf individuals, situational tasks, project-based learning, and continuous feedback.

• Limitations of the study

Of course, this study still has certain limitations. First, the participants were from only one university, resulting in a relatively limited sample size. Future research could expand the sample size to improve the generalizability of the findings. Second, this study primarily employed qualitative research methods; future studies could incorporate quantitative measurements to further validate the developmental model of learning difficulties. Furthermore, future research could continue to track the use of Chinese Sign Language by pre-service teachers after they enter the workforce to further examine the long-term impact of peer-assisted learning for deaf individuals.

5. Conclusion

• Summarize key findings

This study employed a two-cycle action research approach to systematically examine the difficulties faced by pre-service special education teachers in learning Chinese Sign Language (CSL) and the changes in these difficulties following the implementation of Deaf Peer-Assisted Learning (DPAL). The findings indicate that learning difficulties did not simply disappear with the involvement of deaf peers. Instead, they gradually shifted from difficulties related to vocabulary, grammatical structures, and imitation at the classroom level to difficulties related to authentic communication, meaning construction, and communicative competence. The study further found that vocabulary acquisition is only the foundation of CSL learning. Visual-spatial

expression, natural sign language comprehension, communication repair strategies, and authentic interaction are more important for the development of communicative competence. The value of DPAL therefore lies not simply in helping pre-service teachers learn more signs, but in facilitating their transition from mechanical imitation to independent expression, authentic interaction, and meaning negotiation.

Based on these findings, this study proposes the concept of the “Classroom-to-Authentic Communication Transfer Gap” to explain the difficulty experienced by pre-service teachers in transferring language knowledge acquired in classroom settings to authentic communication contexts. The findings suggest that authentic interaction with deaf peers, immediate feedback, situational tasks, and opportunities for independent expression can help learners gradually bridge this gap.

From a practical perspective, CSL teacher education programs should reduce excessive reliance on teacher demonstration and vocabulary memorization and provide more opportunities for learner-generated expression and authentic communication. Deaf peers should be positioned not merely as language models but

also as communication partners, immediate feedback providers, and cultural interpreters. In addition, teaching activities should provide learners with sufficient opportunities to independently produce language before receiving model expressions from deaf peers.

Future research should further explore the long-term effects of DPAL on CSL proficiency among pre-service special education teachers after they enter professional practice. Longitudinal studies could examine whether the communicative competence developed through DPAL can be maintained and transferred to real educational settings. Future studies could also employ mixed-methods designs by combining qualitative data with standardized CSL proficiency assessments to provide stronger evidence of changes in learners’ language development.

Overall, this study contributes to the growing body of research on CSL as a second language and provides a practical and theoretical basis for integrating deaf peer-assisted learning into special education teacher education. It highlights that effective CSL learning should move beyond vocabulary acquisition and classroom imitation toward authentic communication, independent expression, and meaningful interaction.

References

- Journal article: Smith, J. (2022). Inclusive education practices. *Journal of Special Education*, 34(2), 45–60.
- Book: Brown, L. (2021). Disability and learning. New York, NY: Academic Press.
- Alajlan, M. (2017). Knowledge and attitudes of faculty members at a Saudi university toward deaf and hard of hearing students in higher education. [Doctoral dissertation, University of New Orleans], <https://scholarworks.uno.edu/td/2288/>
- Alawajee, O. (2022). Exploring the sign language proficiency of university undergraduate students in a preservices preparation program for teachers of deaf students. *Higher Education Pedagogies*, 7(1), 65–87. <https://doi.org/10.1080/23752696.2022.2092882>
- Al-Fityani, K., & Padden, C. (2010). Sign languages in the Arab world. In D. Brentari (Ed.), *Sign Languages* (pp. 433–450). Cambridge University Press. <https://doi.org/10.1017/CBO9780511712203.020>
- Beal, J. (2020). University American sign language (ASL) second language learners: Receptive and expressive ASL performance. *Journal of Interpretation*, 28(1), 1.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Fu Min & Xu Baosheng. (2018). Research on the Development of General Sign Language Textbooks Based on Second Language Acquisition Theory. *Journal of Modern Special Education (Research in Higher Education)*, (18), 52–57, 66.
- Ginty, C., & Harding, N. M. (2014). The first year experience of a peer assisted learning program in two institutes of technology in Ireland. *Journal of Peer Learning*, 36–56.
- Han Mei. (2024). Exploration and practice of the training model of sign language translation professional talent at the undergraduate level. *Journal of Modern Special Education*, (18), 39–44.

- Hua Yufeng, Chen Yuanqing, Tang Hongxia, & Tu Chaoyang. (2023). Strengthening the practical research on promoting the use of national common sign language. *Journal of Modern Special Education*, (5), 64–66.
- Jia Ling, Sun Dan, & Chen Fu. (2013). Construction and interpretation of the second language learning strategy training system. *Journal of Heilongjiang College of Education*, 32(2), 140–141.
- Lantolf, J. P. (2000). Sociocultural theory and second language learning (Vol. 78). Oxford university press. <https://books.google.com/books?hl=en&lr=&id=imwsewtZKSMC&oi=fnd&pg=PA1&dq=Sociocultural+theory+and+second+language+acquisition&ots=5SP2tP4M-H&sig=hjn0JEaPJ8llzaB0rloESp4zuKc>
- Liu Gang. (2025). Build a bridge of communication: Thinking about the current situation of national common sign language promotion. *Educator*, (6), 68–69.
- Liu Yongping. (2024). Special Education Major from the Perspective of Visual Linguistics Exploration and Practice of Sign Language Teaching Innovation. *Journal of YuZhang Normal University*, 39(6), 8–13, 22.
- Lu Wei. (2015). Creation of teaching situation in multimedia sign language classroom. *The Science Education Article Collects*, (35), 71–72, 85.
- Luo Xiao. (2016). Research on sign language teaching for special education in higher vocational colleges——Improving sign language communication skills. *Theory and Practice of Contemporary Education*, 8(3), 147–149. <https://doi.org/10.13582/j.cnki.167-178.2016.03.049>
- Manogna, R. S., Nivedita, R. R., & Niwas, R. (2021). Readiness of pre-service special educators for inclusive education. *World Wide Journal of Multidisciplinary Research and Development*, 4(3), 113–117.
- Masrizal, M. (2014). The role of negotiation of meaning in L2 interactions: an analysis from the perspective of long's interaction hypothesis. *Studies in English Language and Education*, 1(2), 96–105. <https://doi.org/10.24815/siele.v1i2.1829>
- Peng, Y., & Zhang, J. (2018). A Study on the Use of Sign Language in the Classrooms of Chinese Language Teachers in Schools for the Deaf: A Case Study of a Special Education School in Tangshan City. *Journal of Suihua University*, 38(4).
- Ren & Zhang. (2015). Investigation and Research on Sign Language Teaching for Special Education Majors in New Undergraduate Colleges——Taking Guizhou Institute of Engineering Applied Technology as an Example. *Journal of Guizhou University of Engineering Science*, 33(5), 65–71.
- Wang Qi & Tang Jiayi. (2023). Research on the current status and influencing factors of national common sign language use by teachers in deaf schools. *Chinese Journal of Special Education*, (2), 35–43.
- Yin Bei. (2016). The impact and expansion of 'Proximal Development Zone' in the study of second language acquisition. *Journal of Huainan Normal University*, 18(5), 59–63.
- Zhang Baihui, Liu Yu, & Zhou Ziyu. (2021). Research on practical teaching of sign language courses in colleges and universities. *Journal of Suihua University*, 41(4), 60–62.
- Zhao Xiaochi. (2018). Current situation and suggestions for sign language teaching in colleges and universities. *Science & Technology Information*, 16(35), 174–176. <https://doi.org/10.16661/j.cnki.167-178.2018.35.174>
- Zhou Zhai. (2020). Survey on the Current Situation of National Common Sign Language Promotion in my country——Taking teachers from deaf schools in Shandong Province as an Example, *Liaoning Normal University*. <https://doi.org/10.27212/d.cnki.glnsu.2020.000438>

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Author Declaration

Originality Statement

The authors declare that this manuscript is an original work and has not been published elsewhere or submitted for publication to another journal.

Conflict of Interest

The authors declare that there are no conflicts of interest related to this study