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## Table of Contents

- 1 Teaching Reform of Clinical Medicine Gastroenterology Based on Case-Based Learning and Experiential Teaching Concepts**  
*Xinli Feng, Meng Sun*
- 7 Countermeasures of Teaching English Reading in High Schools in Response to the English Reform of the College Entrance Examination**  
*Ruohan Xu*
- 12 Psychological Support for People with Hard of Hearing, Acquired Hearing Loss, and Auditory Processing Disorders — A Secondary Publication**  
*Noriko Katsuya*
- 25 Exploration of the Perception of Elementary and Secondary Pre-Service Teachers About “Novelty Space” in Learning in Geological Field Trip — A Secondary Publication**  
*Yoon-Sung Choi*
- 45 Research on the Development Path of Shenzhen Elderly Education from the Perspective of Positive Aging**  
*Nan Zhou*
- 54 Subtitle Translation of Chinese Elements in View of Cultural Translation: A Case Study of *Ne Zha: I Am the Destiny***  
*Qianyun Luo, Huiying Wang*
- 64 Exploration of the Blended Learning Model in English Major Education at Private Applied Universities**  
*Wei He*



# Teaching Reform of Clinical Medicine Gastroenterology Based on Case-Based Learning and Experiential Teaching Concepts

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**Abstract:** *Objective:* To explore the value of the application of case-based learning (CBL) and experiential teaching concepts in the teaching reform of clinical medicine gastroenterology. *Methods:* 70 clinical medicine students who interned in the Department of Gastroenterology of our hospital from May 2022 to April 2023 were selected and divided into the control group and the study group of 35 each using the mean score method. The CBL teaching model was adopted in the control group and the CBL combined with experiential teaching model was adopted in the study group. At the end of the internship, Mini-CEX (mini-clinical evaluation exercise) scores, medical record writing scores, and teaching satisfaction surveys were applied to assess the teaching effects of the two groups. *Results:* All scores in the Mini-CEX evaluation scale of the students in the study group were higher than those of the control group ( $P < 0.05$ ); the assessment scores of the students in the study group in the areas of chief complaint, history of other diseases, and psychiatric examination were significantly higher than those of the control group ( $P < 0.05$ ); and the teaching satisfaction of the students in the study group was higher (94.29%) than that of the control group (71.43%), and the difference was statistically significant ( $P < 0.05$ ). *Conclusion:* The teaching effect of clinical medicine gastroenterology based on CBL and experiential teaching concepts is good, which can effectively improve the theoretical and practical performance of interns and increase teaching satisfaction, and it is worth popularizing and applying in the practice of clinical teaching reform.

**Keywords:** Case-based learning teaching; Experiential teaching; Medical education; Teaching reforms

**Online publication:** May 20, 2024

## 1. Introduction

Clinical internship is a key link in medical education and an important stage in the transformation of medical students from theoretical learning to clinical practice. During this process, students accumulate clinical experience through actual participation in patient care, diagnosis, and treatment, so as to better understand and apply what they have learned, help them develop their communication skills, clinical thinking, and sense of professional responsibility, thus laying a solid foundation for their future medical work<sup>[1]</sup>. With the continuous development of China's medical and healthcare programs in recent years, higher demands have been placed on

the comprehensive quality of clinicians, and for this reason, it is necessary to continuously carry out reforms in medical education and innovate the teaching methods of clinical education, so as to cultivate medical students with better job competence. Case-based learning (CBL) teaching method is a commonly used method in the teaching of clinical education at this stage, the core of which is based on real cases, with students as the main body and the teacher as the guide of the modern teaching model <sup>[2]</sup>. Based on specific teaching objectives in CBL teaching practice, teachers provide students with specific case scenarios, so that students use the theoretical knowledge they have mastered, analyze and solve the problem through independent thinking and group discussion, thereby realizing the consolidation of theoretical knowledge and the practice of clinical practice <sup>[3]</sup>. However, due to the different clinical symptoms and signs of patients in gastroenterology, this kind of learning focusing on specific cases cannot comprehensively cover the wide spectrum of diseases in gastroenterology, which makes the students unable to cope with the complexity of the clinical scenarios and restricts the development of their integrative thinking and adaptability. To remedy this shortcoming, this study attempts to integrate experiential teaching concepts into CBL teaching in clinical medicine gastroenterology, in order to realize the innovation of clinical education pedagogy and contribute to the promotion of clinical education reform.

## **2. Study subjects and methods**

### **2.1. Study subjects**

70 clinical medicine students who interned in the Department of Gastroenterology of our hospital from May 2022 to April 2023 were selected and divided into the control group and the study group of 35 students each using the mean score method. In the control group, there were 19 males and 16 females; the age range was 18–23 years with a mean age of  $22.06 \pm 0.45$  years; and the CBL teaching mode was adopted. In the study group, there were 17 males and 18 females; the age range was 18–23 years, with a mean age of  $22.31 \pm 0.55$  years; and the CBL with experiential teaching model was adopted. Both groups of students voluntarily participated in this study, and the general information was compared, the difference was not statistically significant ( $P > 0.05$ ).

### **2.2. Teaching methods**

The instructors of both groups were attending physicians or deputy chief physicians with more than 3 years of clinical work experience in the department, and the teaching materials were compiled by the department, with 60 lessons (theoretical lectures + clinical practice).

The CBL teaching mode was adopted in the control group. During the teaching, the teacher designed the teaching program according to the syllabus, focusing on the pathogenesis, clinical manifestations, differential diagnosis, treatment, and prognosis of common gastroenterology diseases. Then they introduced the teaching with typical cases in the department, which triggered students' interest in exploring the knowledge related to gastroenterology, made them understand the clinical reality of gastroenterology and surgical diseases intuitively, and realized the concretization of abstract theoretical knowledge so that the students could understand and absorb it more easily. In the process of case analysis, the teacher put forward the clinical manifestations, physiology and pathology of gastroenterological diseases, differential diagnosis, and other related basic questions to help students deepen their understanding of the characteristics of gastroenterological diseases, and prompted them to combine anatomy, pathology, etc. with the practical skills of gastroenterology, so as to better understand the key and difficult points of the teaching. In addition, the introduction of cases showed students the multidisciplinary integrated use of gastroenterology disease treatment processes, such as drug therapy, interventional therapy selection, and decision-making process, to enhance the students' theoretical knowledge mastery, enhance their ability to apply theories to practice, and lay a solid foundation for them to be excellent clinicians.

The study group adopted a joint CBL-experiential teaching model. The CBL teaching was the same as above. In the experiential teaching, members of each group took turns to act and simulate typical gastroenterological disease symptoms, while other students acted as receiving physicians to carry out diagnosis and treatment. During the process, the teacher carefully observed the students to complete the diagnosis and treatment process and provided timely corrections to the non-compliance with the process. This role-play not only deepened students' understanding of the characteristics of gastroenterology but also enhanced their clinical thinking and communication skills.

### 2.3. Evaluation indicators

- (1) Evaluation of teaching effect: After the completion of the teaching, the mini-clinical evaluation exercise (Mini-CEX) and the medical record writing scale were applied to evaluate the students' knowledge mastery and the standardization of medical record writing. The Mini-CEX evaluation scale focused on the history inquiry, physical examination, professionalism, clinical judgment, communication efficacy, organizational efficacy, overall performance, etc. <sup>[4]</sup>. The scale was divided into three levels with a 9-point scale: 1–3 for substandard; 4–6 for standard; 7–9 for excellent. The medical record writing scale included 10 points for chief complaint, 30 points for current medical history, 10 points for other medical history (including past history, personal history, and family history), 20 points for psychiatric examination, 10 points for auxiliary examination, and 20 points for clinical diagnosis.
- (2) Teaching satisfaction survey: The questionnaire investigated the students' satisfaction with the teaching mode, including three options "very satisfied," "satisfied," and "dissatisfied." Students filled in the questionnaire according to their real feelings, and statistically analyzed the overall satisfaction. Total satisfaction = (Very satisfied + Satisfied) / Total number of students × 100%.

### 2.4. Statistical analysis

SPSS22.0.0 statistical software was applied to analyze and process the relevant data, and the measurement data were expressed by mean ± standard deviation (SD) and compared by *t*-test; the count data were expressed by [n (%)] and compared by  $\chi^2$  test.  $P < 0.05$  was used to indicate that the difference was statistically significant.

## 3. Results

### 3.1. Comparison of Mini-CEX assessment scores between the two groups

The scores of each item of the Mini-CEX evaluation scale of the students in the study group in terms of history inquiry, physical examination, professionalism, clinical judgment, communication efficacy, organizational efficacy, and overall performance were higher than those of the control group, and the difference was statistically significant ( $P < 0.05$ ), as shown in **Table 1**.

### 3.2. Comparison of the performance on medical record writing assessment between the two groups

In medical record writing, the differences between the two groups of students in terms of current medical history, auxiliary examination, and clinical diagnosis were not significant ( $P > 0.05$ ). However, the assessment scores of the students in the study group in terms of chief complaint, history of other diseases, and psychiatric examination were significantly higher than those of the control group, and the differences were statistically significant ( $P < 0.05$ ), as presented in **Table 2**.

### 3.3. Comparison of students' teaching satisfaction between the two groups

Based on **Table 3**, students' satisfaction with teaching in the study group (94.29%) was significantly higher than that of the control group (71.43%), and the difference was statistically significant ( $P < 0.05$ ).

**Table 1.** Comparison of Mini-CEX assessment scores between the two groups of students (mean  $\pm$  SD, points)

Groups	Medical history inquiries	Clinical examination	Professionalism	Clinical judgment	Communication effectiveness	Organizational effectiveness	Overall performance
Control group (n = 35)	5.12 $\pm$ 0.64	5.23 $\pm$ 0.87	5.38 $\pm$ 1.02	5.21 $\pm$ 0.87	5.42 $\pm$ 0.71	5.39 $\pm$ 0.76	5.61 $\pm$ 0.93
Study group (n = 35)	6.06 $\pm$ 0.72	6.24 $\pm$ 0.79	6.75 $\pm$ 0.79	6.31 $\pm$ 0.67	6.53 $\pm$ 0.68	6.77 $\pm$ 0.65	6.49 $\pm$ 1.13
<i>t</i>	5.7728	5.0846	6.2822	5.9264	8.9655	8.1638	3.5574
<i>P</i>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007

**Table 2.** Comparison of the performance in medical record writing assessment between the two groups (mean  $\pm$  SD, points)

Groups	Chief complain	Current medical history	Other medical history	Psychiatric examination	Auxiliary examination	Clinical diagnosis
Control group (n = 35)	8.33 $\pm$ 0.45	25.39 $\pm$ 2.77	9.17 $\pm$ 0.66	17.29 $\pm$ 1.04	9.14 $\pm$ 0.68	18.77 $\pm$ 0.81
Study group (n = 35)	8.74 $\pm$ 0.63	26.01 $\pm$ 1.87	9.52 $\pm$ 0.71	16.31 $\pm$ 0.97	9.43 $\pm$ 0.71	19.01 $\pm$ 0.92
<i>t</i>	3.1330	1.0975	2.1360	4.0768	1.7451	1.1583
<i>P</i>	0.0026	0.2763	0.0363	0.0001	0.0855	0.2508

**Table 3.** Comparison of students' teaching satisfaction in the two groups [n (%)]

Groups	Very satisfied	Satisfied	Dissatisfied	Total satisfaction
Control group (n = 35)	12 (34.29)	13 (37.14)	10 (28.57)	25 (71.43)
Study group (n = 35)	23 (65.72)	10 (28.57)	2 (5.71)	33 (94.29)
$\chi^2$	-	-	-	6.4368
<i>P</i>	-	-	-	0.0112

## 4. Discussion

### 4.1. The value of joint CBL-experiential teaching method in clinical medicine gastroenterology

Clinical teaching in gastroenterology has strong comprehensive characteristics and has high requirements for interns' professional knowledge and practical skills. Therefore, in the practice of education and teaching, teachers should actively innovate the concept of education, follow the principles of taking students as the main body, stimulating students' interest in learning, improving students' theoretical basics and clinical practice skills, and flexibly choose diversified teaching modes and assessment methods to strengthen students' comprehensive abilities <sup>[5]</sup>.



The CBL-experiential teaching model in clinical medicine gastroenterology combines the benefits of theoretical learning and hands-on practice to enhance student motivation and engagement by combining the theoretical analysis of CBL with the hands-on practice of experiential teaching and learning. The implementation of CBL enables students to explore and analyze complex clinical situations in a safe environment, learn how to gather and analyze information, formulate hypotheses, and develop diagnostic and treatment plans. Experiential teaching, on the other hand, provides a platform to simulate real clinical environments, enabling students to apply the theoretical knowledge they had learned in practice, effectively developing clinical judgment and decision-making skills. In addition, the integrated teaching model also emphasizes teamwork and communication, so that students consolidate their theoretical knowledge, improve their teamwork, and exercise their communication skills during the discussion in the case group. In the following experiential teaching session, the role-playing not only enhances the interaction between students but also enables them to experience the disease treatment process from the patient's perspective, which helps them to understand the patient's feelings and needs, thus realizing the cultivation of empathy and professional attitude and greatly enhancing the quality and effect of clinical medicine education.

## **4.2. Teaching reform practice of clinical medicine gastroenterology based on CBL and experiential teaching concepts**

### **(1) Creating experiential teaching situations**

In gastroenterology clinical teaching, teachers use high-fidelity simulators, patient role-playing, or virtual reality technology to realize the simulation of teaching scenarios in real clinical environments, so that students can directly observe and simulate the handling of a variety of clinical situations, and deepen their understanding of the complexity and diversity of gastroenterological diseases while enhancing their professional knowledge.

### **(2) Stimulating interest in learning**

Stimulating students' interest in learning is an important way to improve the teaching effect. For this reason, when teachers carry out CBL-experiential teaching practice, they choose specific cases related to students' life experiences and with a certain degree of challenge, so that they can master the clinical manifestations of gastroenterological diseases, physiopathology, differential diagnosis, and other related knowledge through case study analysis, and then put forward reasonable questions in a targeted manner, so as to let the students realize knowledge accumulation in the experiential teaching environment and deepen their sensory experience, thus stimulating their learning initiative. The students can realize the accumulation of knowledge in the experiential teaching environment and deepen their sensory experience, thus stimulating their learning initiative <sup>[6]</sup>.

### **(3) Building an atmosphere for teachers and students to learn together**

In CBL-experiential teaching in gastroenterology, teachers should not only play the role of knowledge transmitter but also play the role of guide and participant in the learning process. This integrated teaching model emphasizes group discussion, case study, and role play, where teachers can discuss and solve clinical problems with students, thus creating an interactive and co-learning atmosphere, which not only enhances the teaching effect but also promotes teachers' understanding of students' thinking styles and learning needs.

### **(4) Strengthening the ability to transfer nursing knowledge**

Strengthening students' ability to apply what they have learned to actual clinical care is an important goal of CBL-experiential teaching. In the simulated clinical environment, students not only need to diagnose the disease, but also formulate and implement an effective diagnosis and treatment plan, and

independently complete medical record writing, doctor-patient communication, physical examination, psychiatric examination, and so on. Through such practice, students can deepen their understanding of the diagnosis and treatment process of gastroenterology diseases and enhance their ability to apply their knowledge in a real clinical environment.

## 5. Summary

The results of this study showed that the results of the Mini-CEX evaluation scale of the students in the study group were higher than those of the control group in terms of history inquiry, physical examination, professionalism, clinical judgment, communication efficacy, organizational efficacy, and overall performance ( $P < 0.05$ ); when comparing the assessment scores of the medical record writing, the differences between the two groups in terms of current history, auxiliary examination, and clinical diagnosis were not significant ( $P > 0.05$ ), but the assessment scores of the study group were higher than the control group in terms of chief complaint, history of other disease, and psychiatric examination ( $P < 0.05$ ); and the teaching satisfaction of students in the study group (94.29%) was higher than that of the control group (71.43%). It can be seen that the teaching effect of clinical medicine gastroenterology based on CBL and experiential teaching concept is good, which not only effectively promotes the improvement of the overall quality of teaching, but also greatly stimulates the interns' interest in learning and improves their teaching satisfaction, which is worthy of being widely used in clinical teaching.

## Disclosure statement

The authors declare no conflict of interest.

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# Countermeasures of Teaching English Reading in High Schools in Response to the English Reform of the College Entrance Examination

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**Abstract:** By analyzing the countermeasures taken in high school reading lessons to realize *Gaokao* English reform, this paper describes the design of two reading teaching activities aimed at improving students' reading, critical thinking, and communication skills. Activity 1 activates students' foreknowledge through prediction and verification, develops their prediction ability, and improves the purposefulness and interactivity of reading. Activity 2 deepens students' understanding of the text through detailed comprehension and discussion and hones their critical thinking and cooperative communication skills. Both activities focus on students' subjectivity and participation and emphasize the teacher's guiding and facilitating role in the process.

**Keywords:** Reading teaching; Activity design; Prediction and verification

**Online publication:** May 17, 2024

## 1. Introduction

Reading is an important part of language education, aiming to cultivate students' comprehension, language proficiency, and cultural literacy. However, traditional reading teaching methods often focus on the instillation of knowledge but neglect students' subjectivity and participation, resulting in students' low interest in reading and limited improvement of reading skills. Therefore, this paper proposes two innovative reading teaching activities designed to stimulate students' interest in learning through prediction and verification, detailed comprehension and discussion, enhance reading skills and critical thinking, and cultivate communication skills.

## 2. Teaching reading in the context of the reforming of *Gaokao* English examination

### 2.1. Comparing the characteristics of general English lessons in high school and those of *Gaokao*

There are significant differences in teaching objectives, contents, and methods between general English reading and *Gaokao* English reading. General English reading focuses on cultivating students' language literacy and

cultural awareness, in which teachers will guide students to read texts of various topics and genres, emphasizing the understanding of the text. General English reading also encourages students to broaden their horizons, learn about different cultures, and develop intercultural communication skills through reading. Meanwhile, high school reading teaching for *Gaokao* is more focused and test-oriented. The teaching objective is to help students familiarize themselves with the types of questions and texts for the college entrance examination and to master problem-solving skills and strategies. The teaching content often centers on the real questions and exercises of *Gaokao*, focusing on reading speed, information extraction, and logical reasoning. In *Gaokao* preparation classes teachers will more often use a combination of explanation and training to improve students' performance.

## **2.2. Challenges of high school reading teaching in the context of *Gaokao* reform**

The reform of the college entrance examination has put forward new requirements and challenges for high school reading teaching <sup>[1]</sup>. One prominent issue is the selection and updating of reading materials. Often, teachers and students gravitate towards materials resembling gaokao questions, resulting in homogenization and outdated content. The lack of diverse reading materials fails to engage students' interest and meet their varied reading needs. Furthermore, the singularity of teaching methods is also a pressing issue. Some teachers emphasize too much on test-taking skills instead of cultivating reading and critical thinking skills. This approach leads to an indoctrination method of teaching, in which the students' subjectivity is diminished. This single teaching method not only fails to improve students' reading skills but also inhibits the development of their innovative and critical thinking skills. Furthermore, the *Gaokao* reform calls for updated evaluation methods. Traditional assessment based solely on exam results no longer suffices. Establishing a scientific, comprehensive, and diversified evaluation system is essential to accurately gauge students' reading proficiency and overall literacy.

## **2.3. Measures to optimize high school reading teaching**

Aiming at the problems faced by high school reading teaching under the Gaokao reform, a variety of countermeasures can enhance teaching quality. Teachers should proactively refresh reading materials, selecting articles that reflect contemporary themes, ideologies, knowledge, and student interests. This approach ensures the diversity and novelty of the materials, thereby stimulating students' enthusiasm for reading. Reading materials should be chosen systematically to ensure that each student benefits from the reading experience. Teachers should innovate teaching methodologies, move away from traditional lecture-based approaches, and embrace diverse methods such as inspiration, discussion, and collaboration. Encouraging students to actively engage in reading activities through rich and varied teaching practices, including role-playing, small group discussions, debates, and more, fosters improvement in both reading comprehension and language proficiency <sup>[2]</sup>. Creating an effective evaluation system is essential for enhancing reading teaching. In addition to conventional test scores, factors like students' reading attitudes, habits, and strategies should be integrated into the evaluation process. This comprehensive approach ensures a balanced and objective assessment of students' reading proficiency and overall literacy skills. Emphasizing both formative and summative evaluation methods allows us to track students' performance and progress throughout their reading journey. Providing timely feedback and guidance enables students to continuously enhance their reading abilities.

## **3. Background of *Gaokao* English reform**

Gaokao English reform has put forward new requirements and challenges for high school reading teaching. The background of this reform is multifaceted, including social development, educational reform, and the development of the English subject itself. This study focuses on 100 Chinese sophomore students who

possess a foundational understanding of English and reading skills but require further development in reading skills. These students are facing the challenge of the English language reform of Gaokao, which necessitates enhancements in their reading and comprehensive language abilities. Given the increasing globalization of society and economy, coupled with rapid advancements in information technology, English has emerged as a crucial tool for international communication. Consequently, cultivating a solid English foundation and proficient reading skills has become a pivotal objective in high school English education. The ongoing progression of education reform significantly influences high school reading instruction. The adoption of new curriculum standards and the refinement of Gaokao criteria underscore the importance of students' roles and the nurturing of their capabilities. This necessitates educators to prioritize students' individual differences and interests during instruction, fostering their innovative and critical thinking skills. Furthermore, the evolution of the English subject itself introduces novel demands for high school reading instruction. Through extensive exploration of linguistics, pedagogy, and related disciplines, our understanding of reading instruction deepens, leading to the emergence of innovative teaching concepts and methodologies. These advancements offer a wider array of options for high school reading instruction, enriching its effectiveness and adaptability in modern educational contexts <sup>[3]</sup>. In the context of reading instruction, it's crucial to prioritize the student's central role and foster their abilities. This involves recognizing individual differences and interests among students and employing a variety of teaching methods and resources to enhance their reading skills and overall language proficiency.

## **4. Designing teaching activities**

### **4.1. Teaching materials**

Article title: The Power of Perseverance

Thomas Edison once said, "Genius is one percent inspiration and ninety-nine percent perspiration." This statement rings true for anyone who has ever achieved success through hard work and perseverance. The story of Edison's invention of the light bulb is a prime example of the power of perseverance.

Facing numerous failures, Edison never gave up. Instead, he viewed each failure as a step closer to success. His assistants grew discouraged, but Edison remained optimistic. Finally, after hundreds of attempts, he succeeded in creating the first practical light bulb.

This story teaches us an important lesson about perseverance. Success is often achieved not through a single brilliant idea, but through repeated efforts and continuous improvement. Perseverance means continuing to work hard even when faced with difficulties and setbacks.

In the realm of academics, perseverance is equally important. Students who persevere in their studies are more likely to achieve success than those who give up easily. The road to academic excellence is often long and challenging, but with perseverance, it is achievable.

The same principle applies to other areas of life as well. Whether it's a career, a hobby, or a personal goal, perseverance is the key to success. It requires discipline, focus, and an unwavering belief in oneself.

In conclusion, the power of perseverance cannot be overstated. It is the driving force behind every successful individual and accomplishment. As Edison aptly said, "I have not failed. I've just found 10,000 ways that won't work." So, let us embrace perseverance and never give up on our dreams.

### **4.2. Reading activities**

#### **4.2.1. Pre-reading activities**

(1) Activity 1: Predicting content

This activity aimed to stimulate students' interest in the article they are about to read and to predict its

content. The title of the article “The Power of Perseverance” and some related images, such as a picture of Thomas Edison inventing the light bulb or an image of perseverance and fortitude are displayed. Students are prompted to write down their predictions and then share them with their peers at their tables. Afterward, a few students are selected to share their predictions and explain the reasoning behind them.

(2) Activity 2: Vocabulary warm-up

The objective of this activity is to help students familiarize themselves with vocabulary that may be relevant to the article. A list of vocabulary related to perseverance, success, failure, and invention (e.g., perseverance, success, failure, invention, inspire, discourage, etc.) is given. They work in pairs or small groups to define these words and provide examples or scenarios illustrating each term. Afterward, the class shares their definitions and examples, with the teacher offering correct explanations and usage for each term.

#### 4.2.2. While-reading activities

(1) Activity 1: Skimming for main ideas

The goal of this activity is to develop students’ ability to read rapidly and grasp the main points of a text efficiently. Students are instructed to skim through the article swiftly and identify the topic sentence of each paragraph. Upon completion, they collaborate with their peers at their tables to discuss and determine the topic of each paragraph. The class then reviews and verifies their answers collectively, with the teacher offering guidance and clarification where necessary.

(2) Activity 2: Detailed Reading with Questioning

The purpose of this activity is to deepen students’ understanding of the details of the text and develop their critical thinking. Students engage in careful reading of the article as they prepare to respond to previously provided reading questions, including factual, inference, and vocabulary inquiries. Once students have completed the task independently, they collaborate with their group members to discuss their answers. Selected groups then present their answers and reasoning to the class. The teacher offers feedback, clarifies any misconceptions, and explains the correct answers along with the rationale behind them.

These well-designed reading activities aim to stimulate students’ interest in reading and motivate them to participate more actively in the reading process. By predicting the text’s content, introducing relevant vocabulary, skimming for the main idea, and delving into detailed reading, students not only become acquainted with the text’s material but also hone their ability to extract essential information. This sequence of activities is instrumental in enhancing students’ reading comprehension and nurturing their critical thinking skills. Consequently, it establishes a good foundation for their academic and professional growth, enabling them to refine their language proficiency and cognitive abilities through enjoyable reading experiences.

## 5. Summary

This paper discusses the characteristics, problems, and countermeasures of reading teaching under *Gaokao* reform. The goal is to provide guidance for high school reading teachers to improve their teaching methods, resources, and activities. By doing so, students can better prepare for the challenges of the college entrance exams and enhance their reading skills.

## Disclosure statement

The author declares no conflict of interest.

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# Psychological Support for People with Hard of Hearing, Acquired Hearing Loss, and Auditory Processing Disorders — A Secondary Publication

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**Abstract:** This paper discusses the psychological support available for hard of hearing and acquired hearing loss difficulties. Specifically, it shows the psychological support that has been available to people with hard of hearing and listening problems, including those who became hard of hearing after acquiring language, those with mild to moderate hearing loss, those with unilateral hearing loss, those with an auditory processing disorder, and those who do not have a physical disability certificate. This paper also proposes support for people who have hitherto been unlikely to access such support and describes the current status of efforts to make support available in Japan. This paper covers the psychological support provided by specialists, by people who are close to the individuals in question but are not specialists, and by other people who are hard of hearing. Support by people with hearing loss can be divided into three types: self-help groups, meetings for people with hearing loss, and “*Tojisha-Kenkyu*,” groups that research self-support. Each of these forms of psychological support is described, and the current status and the barriers to the provision of support by people who are hard of hearing are described in detail. As future tasks, the author notes the tasks of how to maintain the cohesion of the various groups, empirical research on the effects of psychological support, and the need to raise greater awareness and disseminate information about hard-of-hearing people’s meetings that engage in psychological support activities.

**Keywords:** Hard of hearing; Acquired hearing loss; Psychological support; Self-help group; Research into self-support

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## 1. Introduction

Being diagnosed with hearing loss, or having fixed symptoms of hearing loss, causes the person with hearing loss or deafness to face a variety of difficulties in daily life. For example, a visit to an otolaryngologist may reveal a disease that causes hearing loss, or a person may be found to have hearing loss without a specific cause, but have no facilities or people close by to consult about the future. They may also have problems and concerns associated with their hearing difficulties, but they may not know how to deal with them and may keep them to themselves. For these people with hearing loss, not only medical <sup>[1]</sup> and informational <sup>[2]</sup> support, but also psychological support to maintain mental health is important. This paper discusses the current status of

psychological support for people with hearing loss and people with partial hearing loss in Japan.

There are various expressions for the condition of hearing loss, such as “deafness,” “hearing impairment,” and “hearing loss,” and there are various discussions on how to define each. In this paper, referring to Fujishima and Iwata<sup>[3]</sup> and Iwata<sup>[4]</sup>, we define a “deaf person” as one whose average hearing level is 90 dB or lower and whose main language of communication is spoken language, and a “deaf person” as one whose average hearing level is 90 dB or higher and whose main means of communication is sign language, but whose hearing is not fully utilized. In addition, those who were born with normal hearing but became hard of hearing due to illness, injury, or some other causes are defined as “hearing-impaired.”

Deaf people who do not utilize their hearing and whose first language is sign language are included here in the category of hearing impairment. As will be discussed later, various types of hearing loss are included, such as those with mild/moderate hearing loss, those with unilateral hearing loss in only one ear, and those with cochlear implants. In this paper, the primary discussion will be with persons who are hard of hearing and those who are deaf-mute. The discussion will also include those with auditory information processing disorders who are unable to comprehend the content of conversations due to difficulties with attention and other cognitive processing.

## 2. Mental health issues of people with hearing loss

People with hearing loss who do not have hearing loss sufficient to qualify for a physical disability certificate but have hearing loss due to illness or other reasons and who are able to use their hearing with hearing aids or cochlear implants experience a variety of stress events in their daily lives<sup>[5]</sup>. Stress can build up without being well addressed and can lead to mental ill-health. In fact, it has been noted that people with hearing loss tend to have lower levels of mental health than people with normal hearing<sup>[6-9]</sup>. In addition to the association with anger<sup>[10]</sup>, a meta-analysis has shown an association between hearing loss and depression<sup>[11]</sup>. In a series of studies, Takizawa<sup>[8,9]</sup> compared deaf people in Japan and the U.S. using the GHQ30 Mental Health Questionnaire and found that the mental health of deaf people tended to be lower than that of normal people in both countries.

However, the degree of hearing loss is not necessarily related to mental health. In Takamiya and Fujita<sup>[7]</sup>, in addition to the grade of the physical disability certificate, the age at which the disability occurred and the number of years elapsed did not show any association with mental health. In a survey of students<sup>[8]</sup>, mental health was found to be higher among deaf students than among hard-of-hearing students. Thus, the more severe the hearing loss, the less mentally unhealthy the patient is. There are also reported problems and struggles unique to mild and moderate hearing loss<sup>[12]</sup> and unilateral hearing loss<sup>[13]</sup>, where one ear is deaf or has lost its hearing. Therefore, it is necessary to provide psychological support, keeping in mind that there are diverse problems and concerns that depend on the degree and type of hearing loss<sup>[14]</sup>.

For deaf people whose first language is sign language and hearing-impaired people who have difficulty utilizing their hearing, there have been practical activities that serve as psychological support, such as psycho-clinical intervention activities and identity development support through sign language and other means<sup>[15-18]</sup>. On the other hand, for those with mild/moderate hearing loss, those with unilateral hearing loss, and those with partial hearing loss, few are native signers, and learning sign language does not always lead to psychological support. In addition, there have been few practical activities and empirical studies, coupled with the fact that it is difficult to obtain a physical disability certificate and to be eligible for public support, and effective support has not been clarified<sup>[19]</sup>. This paper discusses the current state of psychological support for people with hearing loss and people who are deaf-mute in our country, as well as the future of such support. Firstly, factors related

to the mental health of people with hearing loss will be discussed, followed by a description of what factors are associated with mental health. Then, the actual situation and issues of psychological support for people with hearing loss will be discussed.

### 3. Factors related to mental health of persons with hearing loss

When considering how to provide psychological support to persons with hearing loss, it is useful to sort out the factors that affect the mental health of persons with hearing loss.

Factors that affect the mental health of persons with hearing loss can be broadly classified into social factors surrounding the person with hearing loss and factors within the individual person with hearing loss.

Social factors include access to health care services for mental and physical health counseling, including hearing loss <sup>[20,21]</sup>, opportunities for contact with people with hearing loss other than oneself <sup>[22]</sup>, stigma <sup>[23]</sup>, degree of access to social support <sup>[24,25]</sup>, and social capital <sup>[26]</sup>.

In addition, intra-individual factors for people with hearing loss include (1) type and degree of hearing loss, (2) stress experiences specific to hearing loss, (3) stress coping and communication strategies <sup>[23,27,28]</sup>, and (4) identity <sup>[5]</sup>.

Firstly, with regard to the type and degree of hearing loss, it is difficult to disclose hearing loss <sup>[13]</sup> and to share concerns <sup>[29]</sup> among those with unilateral hearing loss who are deaf or have lost hearing in only one ear. Difficulty in disclosure has also been shown in middle-aged deafblind people who experienced a period of time without a physical disability certificate <sup>[30]</sup>. For those with mild or moderate hearing loss who do not meet the criteria for obtaining a physical disability certificate, whether or not they are able to converse depends on the indoor environment, voice quality, and other circumstances. They are placed in an ambiguous position of being “neither normal hearing nor hearing impaired” <sup>[5]</sup>, and their difficulties are easily underestimated <sup>[12]</sup>, leading to a lack of support.

Next, regarding stress experiences specific to hearing loss, interpersonal stress due to communication difficulties and failures, and stress in accomplishing tasks due to difficulty in obtaining necessary information were identified <sup>[31]</sup>. How people with hearing loss cope with these stresses influences their mental health.

In terms of stress coping and communication strategies, problems in coping with stressful experiences specific to hearing loss and communication strategies in difficult-to-hear situations can lead to poor mental health. For example, “avoiding communication” coping <sup>[32]</sup> has been noted to lead to depression. According to a study by Suzuki *et al.* <sup>[33]</sup> using the “Communication Strategies” questionnaire item of the “Questionnaire on Hearing Loss 2002” <sup>[34]</sup>, respondents differed in their use of strategies (coping strategies) according to age and hearing loss severity. Suzuki *et al.* <sup>[33]</sup> divided hearing loss severity into four groups: mild (average hearing level of less than 40 dB), light-moderate (40 dB to 50 dB), moderate (50 dB to 70 dB), and severe (70 dB or more). The results showed that the frequency of use of both “request-based strategies” and “self-help strategies” did not differ by hearing loss severity in the younger group, while the older group reported that they were less likely to use either strategy if the severity of their hearing loss was mild. When compared by age group, the older group used the “requested strategy” more than the younger group for mild-moderate hearing loss. On the other hand, the younger group used “self-help strategies” more than the older group for mild hearing loss, but the older group used them more frequently than the younger group for severe hearing loss. How strategies are taken and used in different situations is also related to smooth communication, and its success or failure is thought to affect mental health. It is necessary to understand the characteristics of the coping strategies of people with hearing loss and to provide psychological support to help them cope appropriately.



In a survey of teachers with hearing impairment working in regular schools for the deaf and elementary, middle, and high schools nationwide <sup>[35]</sup>, coping behaviors were not involved in stress reduction among teachers in regular schools. The authors point out the importance of guaranteeing information at work, smooth communication with others, and personal relationships with those around them in order to reduce work-related stress for teachers who are deaf or hard of hearing.

Lastly, there is the issue of identity. Some people with hearing loss encounter sign language and choose to live as Deaf people without hearing aids or cochlear implants through life support for people with hearing loss organized by the Federation of the Deaf, the Association of the Deaf, and the Association of Deafblind and Hard of Hearing People <sup>[3,36]</sup>. On the other hand, others live with hearing loss by utilizing their hearing with hearing aids or cochlear implants. When a person lives with hearing loss, how he or she defines himself or herself in terms of hearing affects his or her way of life and psychological adjustment, which in turn affects his or her mental health.

## **4. Psychological support for the hearing impaired**

Next, we will look at the current status and problems in Japan of psychological support for people with hearing loss. Psychological support for persons with hearing loss against risk factors for mental health can be divided into several forms. Specifically, there are (1) professional support, (2) non-professional support, and (3) support by people with the same disability. Support activities span a variety of settings, including hospitals, educational settings, local communities, and the Internet.

In this chapter, we will focus not on deaf people whose first language is sign language and who have difficulty using their hearing, but on those who have acquired a spoken language as their mother tongue and have the hearing to use their hearing in daily life, but whose hearing is not normal and who have hearing loss due to birth, disease, injury or some other cause (deaf people and hearing-impaired people). This is because these people have relatively little access to support and are at risk of being alone when faced with a problem.

Although there have been accumulated practical activities and studies on support for Deaf children and people <sup>[15,37]</sup>, this paper focuses on psychological support for people with hearing loss, which has not been discussed much so far.

### **4.1. Professional assistance**

Professional psychological support includes assessment, counseling, and psychotherapy by clinical psychologists and licensed psychologists, as well as consultation assistance and lifestyle support by mental health workers. Examples include mental illness as a secondary disorder resulting from hearing loss and support for patients with both mental illness and hearing impairment <sup>[38]</sup>, treatment of tinnitus with cognitive behavioral therapy <sup>[39]</sup>, treatment of psychosomatic disorders <sup>[40]</sup>, and psycho-clinical intervention for functional hearing loss in children <sup>[41]</sup>. In April 1993, Biwako Hospital in Shiga Prefecture opened an outpatient clinic for the hearing impaired <sup>[42]</sup>, where “people with hearing disabilities can receive appropriate and adequate medical care smoothly and at ease” <sup>[43]</sup>.

Cases have been reported in which psychological support specialists intervene in medical examinations for persons with hearing loss <sup>[18]</sup>. Nevertheless, compared to psychiatry and psychosomatic medicine, few otolaryngology departments have specialists in psychological support <sup>[44]</sup>. In addition, some counseling and psychotherapy procedures are difficult to administer to people with hearing loss using standard procedures, such as teaching only through spoken language. It is necessary to arrange them for people with hearing loss by presenting information visually or by using sign language.

In the field of education, there are practices of independent activities aimed at deepening disability awareness in elementary school classes for the hearing impaired <sup>[45]</sup> and information sharing through the use of social gatherings <sup>[46]</sup>, but psychological support for children with hearing loss is not sufficient. In a survey of people with hearing loss who had experienced inclusive education, they reported difficulties not only in learning but also in friendships <sup>[47]</sup>. Emotional development and adjustment problems have also been noted in children with unilateral hearing loss <sup>[48,49]</sup>, and cases have been noted in which children seek educational support after problems become apparent <sup>[50]</sup>. It is necessary to detect hearing problems early, even before schooling, and to provide post-school support through multi-professional collaboration <sup>[51]</sup>.

## **4.2. Non-professional assistance**

Support from non-professionals includes social support from intimate others such as friends, family, and spouses. In the *Seishin Shinrigaku Jiten* [New Edition], edited by Shimoyama *et al.* <sup>[52]</sup>, social support is described as “various types of assistance obtained from others in interpersonal relationships. Social support can be obtained from intimate people in one’s daily life to maintain mental health <sup>[25]</sup>. For example, according to West <sup>[25]</sup>, those with lower levels of social support also had higher levels of depression with lower self-evaluations of hearing. On the other hand, those with a higher degree of social support did not have a higher degree of depression, even though they had lower self-rated hearing; in fact, they had lower depression than those with higher self-rated hearing.

In addition, among non-professionals, the role of the disabled, with whom we do not have frequent contact but who can be an important source of support when we are faced with difficulties, is also significant. This point is discussed in more detail in the next section.

## **4.3. Support for the disabled**

Lastly, we offer support from people with the same hearing loss. Specifically, (1) support activities by existing organizations of people with hearing loss, such as the Federation of the Deaf and the Japan Federation of Deafblind People’s Associations (JFDA) and the Japan Association of Hearing Impaired and Deafblind People (JHIA), (2) self-help groups organized by different organizations of people with hearing loss, (3) party exchange meetings, and (4) party research and support for people with hearing loss. The current status and issues for each are described below.

### **4.3.1. Support activities by existing organizations**

Traditionally, the Federation of the Deaf and Associations of the Deaf have provided support for people with hearing loss. As part of such activities, support for learning sign language has been provided under the names of sign language classes, communication classes, etc., to help people with hearing loss who have difficulty communicating through spoken language alone to acquire sign language as a support for smooth communication. In the sense that communicating leads to mental health <sup>[53]</sup>, such support for learning sign language is also linked to psychological support. Thus, existing organizations have played a certain role.

Some people with hearing loss or partial hearing loss wear hearing aids or cochlear implants but choose to acquire sign language and acquire a deaf identity <sup>[54,55]</sup>. For these people, deaf federations and associations, many of whom are native signers, can provide emotional support.

However, the members of these organizations and the support activities sponsored by these organizations tend to include a relatively large number of deaf people and others with a low degree of auditory utilization and older age groups. Those with mild or moderate hearing loss who do not qualify for a physical disability certificate, those with unilateral hearing loss, and those with hearing loss in younger age groups are engaged

in support activities separately from existing organizations. Therefore, next, we will discuss activities that also target people with hearing loss who do not qualify for a physical disability certificate. As shown in **Table 1**, there are various support groups and circles for the hearing impaired throughout Japan. Each of them is led by a person who is deaf or hard of hearing, but they differ in their basic ideas, purposes, and forms of holding meetings.

#### 4.3.2. Self-help groups

Self-help groups are “groups of people with the same problems who get together and provide mutual understanding and support”<sup>[56]</sup>.

Kikoro, a group of people with unilateral hearing loss, regularly holds discussion and study groups for people with unilateral hearing loss under the concept of “people with different ways of hearing.” Meetings are held in various regions, and participants range in age from young to old. These meetings are considered to play the role of self-help groups.

In addition, the Kyoto-based “Kamonohashi” group for people with mild to moderate hearing loss holds regular meetings and disseminates information via a blog. In these meetings, participants share their experiences and offer advice to each other, and the group is considered to be fulfilling its role as a self-help group.

Additionally, there is a stress-coping workshop for people with hearing loss<sup>[57]</sup>. This workshop aimed to increase understanding and enable participants to cope in their own way with regard to the stress they experience due to hearing loss. As a result, there were no significant changes in psychological indices measured before and after participation in the workshop, but there were some descriptions in the free comments that were evaluated in a certain way, such as “I was able to look back” and “I was able to think objectively. It is thought to lead to reflection on one’s own problems and self-understanding, including hearing loss. One participant commented, “The booklet of interviews with people with hearing loss was very useful. The ability to share various opinions and information with people who share the same hearing loss as oneself and to learn how other people with hearing loss cope with their hearing loss is expected to increase stress management.

Recently, support has also been provided for auditory processing disorder (APD), which refers to symptoms of difficulty hearing in noise and other situations that are normal on pure tone audiometry<sup>[58]</sup>. There is no problem with the gap detection threshold (temporal resolution), and cognitive or psychological problems are considered a factor<sup>[59]</sup>, and many cases complain that they cannot hear speech as words even though they can hear speech. APD sufferers do not have problems with pure tone audiometry, which delays the discovery of their problems and makes it difficult for them to understand their speech-listening difficulties. In addition, because of their normal hearing, they are not eligible to obtain a physical disability certificate and receive welfare services. Therefore, APD patients are actively engaged in party association activities through websites and social networking services (SNS).

The APD Parties Association APS (short for APD Peer Support) conducts activities such as lifehack study groups to research coping strategies, online meetings, and consultation support<sup>[60]</sup>.

In Japan, studies have been reported on the practical activities and empirical effects of self-help groups for various parties, including addiction, mental illness, non-attendance, withdrawal, and cancer patients (e.g., Takahashi *et al.*<sup>[61]</sup>). On the other hand, very few self-help groups for people with hearing loss have collected any data or have been reported as studies, although there are reports of practical activities by the organizations concerned (**Table 1**). Those organized by the organizations concerned have been reported at meetings held by the organizations concerned, but there have been no reports of results as empirical research through research reports or articles.

**Table 1.** Examples of organizations for the hearing impaired and hard of hearing

Corporate name	Overview of meetings and activities
Hearing Loss Self-Support Kyoto - Association for People with Mild to Moderate Hearing Loss	Established in 2013. The location is Kyoto, Japan. The purpose is to provide information and a place where people with mild to moderate hearing loss who cannot receive public support from the national government can talk to each other and solve their difficulties in life (currently in recess).
Kikoiro Community for the Hearing Impaired in One Ear	Established in 2019. Japan's first organization for people with hearing loss in one ear. It operates communities and projects for people who are deaf or hard of hearing in one ear. Activities are conducted in various parts of Japan. Activities include information dissemination, lectures on deafness in one ear (study groups), and training for general/professional people with deafness in one ear.
"Kamonohashi" group for people with mild to moderate hearing loss	Established in 1999 in Kyoto City, mainly for people with mild to moderate hearing loss. The location of the group is Kyoto. The number of participants in the meetings is 10 to 20.
Link	Started activities in 2011 in Kobe City, Hyogo Prefecture. The place of activity is Hyogo. The company provides support activities for "people who have lost their hearing or have become hard of hearing in the course of their lives."
Information and Culture Center for the Hearing Impaired, a social welfare corporation	Founded in 1980 as a social welfare corporation specializing in support for the hearing impaired. It aims to contribute to the welfare of the hearing impaired through the production and lending of visual materials for the hearing impaired, operation of a library space, support for learning and cultural activities of the hearing impaired, and support for the hearing impaired and related people, including consultation support. The facility is located in Meguro-ku, Tokyo.
Hard of Hearing and Hearing Impaired Circle of Harmony (Nagomino Kai)	Founded in 2009. The location is Kanazawa City, Ishikawa Prefecture, Japan. A circle where people with hearing loss and people with partial hearing loss can get together for friendship, information exchange, and social participation. In addition to regular meetings, communication study sessions are held. There are 27 members.
APD (Auditory Processing Dis- order) Party Association APS	Founded in June 2018. Activities are held in Tokyo, Kanagawa, Miyagi, Aichi, and other locations. A group for people with auditory information processing disorder (APD), aiming to bring together people who have difficulties, hardships, and worries caused by APD, to connect with each other, to raise awareness of APD, to improve APD symptoms, and to lead better lives. 63 members in the LINE group and 146 members in the Kokkuchizu group.

The summary description is based on the descriptions on the website, brochures, and inquiries to the representatives (information is current as of November 2021 at the time of writing the paper).

Self-help group-like practical activities are being conducted in many places, but there are few studies that have evaluated the practical activities and verified their effectiveness. In the future, it will be necessary to collect objective indicators and promote empirical evaluation research.

#### 4.3.3. Social gathering for people with the same disease or disability

This term refers to gatherings where people with the same disease or disability get together and interact through events such as chatting, watching movies and dramas, workshops, and game tournaments. In addition to associations, social welfare councils, and hearing impairment welfare centers, some of the organizations listed in **Table 1** may also host such meetings. The association organizes recreational activities for its members, such as karaoke, watching movies, and trips. Outside of associations, there are events aimed at interaction among participants, as well as "salons for the hearing impaired" and other events aimed at discovering people with hearing loss who are eligible for support. These meetings do not have a single theme but are held on a variety of topics and contents (**Table 2**).



**Table 2.** Examples of social events for the hearing impaired and those with hearing difficulties

Name of social event (name of sponsoring organization in parentheses)	Overview of meetings and activities
Regular meeting (Hearing Loss Self-Support Kyoto - Association for People with Mild to Moderate Hearing Loss)	It is a self-help group that creates a place where people with hearing loss can talk to each other and care for each other.
Regular meeting (Kamonohashi, a group for people with mild to moderate hearing loss)	The number of participants is about 10 to 20. Members gather not only from Kyoto Prefecture but also from other prefectures to exchange information and opinions on hearing loss. The meetings are held four to five times a year.
Regular meeting (Hard of Hearing and Hearing Impaired Circle of Harmony (Nagomino Kai))	Members are mainly hearing-impaired people living in Ishikawa and Toyama prefectures. Tea parties, mini-games, communication learning (sign language ICT learning), trips, sports, art appreciation, culture, history learning, etc. Held about once a month.
Issue-specific group work (Information and Culture Center for the Deaf and Hard of Hearing)	The program is conducted for teachers of the hearing impaired, mothers of the hearing impaired, and labor problems of the hearing impaired. Information is guaranteed through hearing loops, written and sign language interpreters. Held three times a year.
Chat Session for Hearing Loss and Hearing Impairment (Link)	The program is based on the idea that people who are in the middle of their lives and have difficulty hearing or have just lost their hearing need a place where they can listen to the experiences of their seniors and talk about their problems in a relaxed atmosphere. We provide a place where they can check themselves and look back in a stable manner. The number of participants is limited to 10 or less. Held irregularly.
Kikoiro, a community for people with hearing loss in one ear	The “One Hearing Loss Conference” is held mainly for people with unilateral hearing loss as “a place where people with hearing loss in one ear can casually get together and chat.” It is planned to provide a place where people can feel that they are not alone. Held once a month. The number of participants is limited to 4-6 people each time.
Kikoe Cafe (Hearing Cafe)	A social gathering for people with hearing and listening difficulties, aiming to share feelings and wisdom among people with hearing difficulties. The meetings are open to people of any age, place of residence, type of hearing loss, and whether or not they have a physical disability certificate. Held once a month
APD Parties Networking Meetings, Online Meetings (APD Parties Association APS)	The APD Parties Networking Group is a group for APD parties to get together and loosely exchange information. Online meetings are held using Zoom and chat. Both meetings are held irregularly and have less than 20 participants.

The description is based on the website, descriptions in the explanatory materials, and inquiries to the representatives (information is current as of November 2021, the time of writing the paper).

Among them, the “One Hearing Loss Café” by Kikoiro, an organization for people with unilateral hearing loss, has been held since 2019. The café is a “place where people with hearing loss in one ear can casually gather and chat” and is mainly aimed at people with hearing loss. They were held once a month in Tokyo, Kanagawa, Osaka, and other locations throughout Japan, not only in person but also online. The themes vary from free discussions to specific themes, and the number of participants is kept small, with a maximum of four to six people. The aim is to provide a place where people can feel that they are not alone.

“Kikoe Cafe”<sup>[62]</sup> is a social gathering that has been held since 2018. Initially held irregularly, it has recently been held once a month in Kanagawa and Ishikawa prefectures, as well as online. In order to make it easier for people with hearing loss who cannot obtain a physical disability certificate to participate, the event is announced and held as a social event for “people who have difficulty hearing or hearing” rather than “for the hearing impaired or hard of hearing. Discussions have been held on different topics such as “New Lifestyles” and “Communication Devices.” In some cases, only people with hearing loss participated, while in other times, people with normal hearing participated. The number of participants varied from 4 to 20. The participants’ comments in the free text were positive: “It was good to be able to talk,” “I was able to make connections with

other people with hearing loss,” and “I was able to learn useful information.

In addition, hearing-impaired people’s clubs in each community also hold events and recreational activities for the purpose of friendship. For example, the Kanazawa-based “Nagomino Kai” holds meetings at each seasonal milestone, such as Christmas and New Year’s, to promote friendship.

The purpose of the exchange meetings is to bring people with hearing loss and hearing difficulties together, but it is also considered to play a role in uncovering people who are eligible for support and in connecting people in the same situation of hearing loss. Participation in social events can be expected to play a self-help group role in sharing knowledge about hearing loss, obtaining sources of social support, and also functioning as social capital in the community <sup>[26]</sup>. It is also expected to reduce the handicap (social disadvantage) <sup>[63]</sup> caused by communication difficulties due to hearing loss, such as loss of confidence and feeling left out. In addition, psychological benefits such as an increased sense of acceptance, a deeper self-understanding as a person with hearing loss, and the giving and receiving of informational, evaluative, and emotional support are expected. Future empirical studies, including follow-up surveys, should be conducted to clarify the impact of participation in the exchange meetings for people with hearing loss.

#### **4.3.4. Party research**

Party research is “an empowerment approach that has emerged and grown out of the activities and lives of people with schizophrenia and other disorders based on entrepreneurship, such as the ‘Beteru no Ie’ in Urakawa Town, Hokkaido” and is “a tool for self-help—helping, encouraging, and utilizing oneself—and autonomy (self-healing and self-governance) born from the accumulation of life experiences of the people concerned” <sup>[64]</sup>. Practices for research on persons with mental disabilities, including the practice targeting persons with mental disabilities at the “Bereru no Ie” in Urakawa Town, Hokkaido <sup>[65]</sup>, as well as research practices for persons with developmental disabilities, drug and alcohol dependents, and others have been carried out <sup>[66]</sup>.

In the case of party research for the hearing impaired, a series of practices by Matsu can be given <sup>[67]</sup>. Since 2018, Matsu has organized a symposium titled “Party Research x Hearing Impairment Symposium.” In this symposium, deaf, hard-of-hearing, and (not strictly speaking, hearing impaired) parties with auditory information processing disorders report on their own practices in clarifying issues related to their own hearing. It has been noted that engaging in party research has effects on self-understanding <sup>[67]</sup>, and the same symposium in 2019 reported on the results of “party research” using personal histories, memoirs, and diaries of hearing-impaired parties as the subject matter. Party research is expected to function not only for self-understanding but also as a self-help group by sharing the results of reported party research with others and obtaining their opinions and impressions. In the future, it will be necessary to standardize the procedures for party research and to study the effects of participating in party research through certain procedures.

### **5. Future issues**

This chapter describes issues to be considered in the future regarding psychological support for persons with hearing loss. First, with regard to psychological support by specialists, it is desirable that specialists in psychological support, such as licensed psychologists, clinical psychologists, and mental health workers, promote their activities not only in psychiatry and psychosomatic medicine but also in departments that treat diseases related to hearing loss, mainly in otorhinolaryngology. It is necessary to promote psychological support for persons with hearing loss through collaboration among various professions, including physicians, nurses, speech-language pathologists, social workers, and teachers.

Next, it is necessary to accumulate and share the know-how necessary for holding meetings with the

parties concerned. However, it is difficult to say that the know-how on the procedures for holding meetings, materials used, evaluations from participants, and methods of conducting meetings has been sufficiently shared and accumulated.

Therefore, it is expected that by creating a mechanism to connect organizations that sponsor meetings of the parties concerned, share practical examples, and share tools, worksheets, and other materials that are useful when holding meetings, it will become easier to hold meetings in any region, and the quality of the meetings will remain constant.

Furthermore, it is necessary to empirically examine the effectiveness of psychological support from the parties involved. Currently, many party meetings are held in each region, but there are very few literature materials available for open-access reading of the contents of the meetings as articles or reports. In addition, since the effects of participation in meetings by parties have not been measured and examined using objective indicators, it is believed that many of the effects are unknown. Future research should be conducted to measure various psychological measures on those who participated in meetings by the parties and to examine their effects.

Finally, it is necessary to raise awareness and disseminate information about associations of people with hearing loss who are engaged in psychological support activities for people with hearing loss. It is thought that there are people with hearing loss in each community who do not have a hearing care provider close by, who are unable to discuss various hearing-related difficulties in their daily lives and are left on their own, or who are unable to solve their problems because it is difficult to obtain the necessary information. If information is disseminated not only through print media but also through Internet tools such as portal sites and SNS, many people will recognize that there are places where they can connect and receive necessary support when they are faced with difficulties. Even if there are no hearing-impaired people around them, they will be able to make appropriate use of the information when they need psychological support in the future by knowing that one of the social resources is an association for people with hearing loss who can receive psychological support.

## Disclosure statement

The author declares no conflict of interest.

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# Exploration of the Perception of Elementary and Secondary Pre-Service Teachers About “Novelty Space” in Learning in Geological Field Trip — A Secondary Publication

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**Abstract:** The purpose of this study was to examine the perceptions of novelty space among pre-service elementary and secondary earth science teachers. We conducted a survey to explore the perceptions of 38 pre-service elementary school teachers at the National University of Education and 31 pre-service secondary earth science teachers at the Department of Earth Science Education at B University. Semi-structured interviews were conducted with 12 participants, including three pre-service elementary teachers and nine pre-service secondary science teachers. In addition to the elements of novelty space, prior knowledge (cognition), prior outdoor learning experience (psychology), familiarity (geography) with outdoor field learning, and social and technical elements were added. When classified based on elementary and secondary levels, there were statistically significant differences in cognitive, psychological, geographic, and social areas for the elements of novelty space. Statistical differences indicated that the experience or capital related to outdoor learning may have resulted from more pre-service secondary earth science teachers than pre-service elementary teachers. In additional interviews, both elementary and secondary pre-service teachers reported that competencies in the technical domain would be emphasized in the future owing to the necessity and the technical development of virtual-reality-based outdoor field learning programs. This study emphasizes the academic significance of novelty space that should be considered to conduct geological field learning for elementary and secondary earth science pre-service teachers while considering the current post-pandemic educational context.

**Keywords:** Novelty space; Learning in virtual geological field trips; Geoscience education

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## 1. Introduction

In the case of Danyang, the most recently selected National Geopark, the website of the National Geopark provides not only geological sites that the public can observe with the naked eye, but also geological tours using virtual reality (VR) technology, or programs that citizens can participate in, in the form of virtual reality.

Anyone can easily access the website through a variety of media, including mobile phones and personal computers (PCs), and enjoy the experience of being in the field. This is also true for outdoor geology learning for students. From the 2010s to the recent past, there have been a number of Korean studies that have applied virtual reality-based outdoor geology learning <sup>[1-6]</sup>. The most recent Korean example is Choi <sup>[7]</sup>, who used curriculum content to implement outdoor geology learning in a virtual reality program to implement outdoor geology learning in virtual reality using curriculum content. In the domestic case, there is a lot of interest in outdoor geology learning that can be utilized for educational purposes in a non-face-to-face environment based on virtual spaces rather than real-world spaces. At the university level, Arizona State University and Illinois State University have developed virtual outdoor geology learning programs that can be accessed in a non-face-to-face environment, centered on places and topics that can be studied, and provided to university students. The positive aspects of virtual outdoor geology learning have been proposed as an alternative to overcome the difficulties of conducting real outdoor geological expeditions in a face-to-face environment due to safety concerns, budgetary issues, etc. The development and learning effects of virtual outdoor geology learning programs began to be emphasized <sup>[8]</sup>. In this process, virtual outdoor geological learning has evolved from a 2D type of data that observes photos through PC access to 3D data that is provided in various forms, such as 360-degree panoramas, 360-degree camera photos, drone photos, Google Tour Creator, VR technology utilization, and voice insertion, so that we can access 3D data and enjoy geological elements as if we were visiting the site <sup>[9]</sup>. In addition, with the renewed emphasis on post-COVID-19 non-contact environments as learning environments, many new studies have been proposed for virtual outdoor geology expeditions, as well as positive findings in cognitive and definitional domains <sup>[10-20]</sup>. As such, many cases at home and abroad are currently working on various forms of outdoor geology learning that utilize virtual reality.

The components of outdoor learning for implementing outdoor geology learning can be broadly categorized into three main components: cognitive, psychological, and geographic <sup>[21]</sup>. Cognitive elements are related to scientific knowledge and concepts. The psychological domain refers to the idea that ensuring that students feel psychologically secure, rather than negatively affected by prior outdoor experiences, or by anxiety, fear, or difficulty with outdoor learning, can help their learning outcomes. The idea is that making students feel psychologically secure, rather than in a negative state of mind, can be beneficial to their learning outcomes. Geography is the familiarity or familiarity with the outdoor learning area, including the sense that the more geographical information students know, the more familiar they are, the better it can help them learn. Reducing the unfamiliar experience space is important for successful outdoor learning, and Orion and Hofstein <sup>[22]</sup> hypothesized that the larger the size of this space, the more difficult it is to perform outdoor learning tasks.

Previous studies have emphasized cognitive, psychological, and geographical familiarity and unfamiliarity with the experience space in order to facilitate outdoor geology learning, and have argued that the smaller the size of the unfamiliar experience space, the more successful outdoor geology learning can be <sup>[22]</sup>. On the other hand, the current virtual outdoor geology learning that can be applied in a non-face-to-face environment is not only limited to the existing unfamiliar experience space, but also raises the need for another dimension of outdoor learning <sup>[23]</sup>. For example, Lee and Shea's <sup>[24]</sup> study emphasized teacher expertise in terms of how teachers perceive the technical aspects of facilitating learning for students in a virtual reality-based environment. Teacher expertise is emphasized. We were interested in how proficient teachers are in terms of technology, such as VR and AR, and how they perceive the use of these technologies for educational purposes. Just as we investigated the perceptions of new technological aspects of outdoor geology learning in a contactless environment, we have reached a point where another level of unfamiliar experiential space is needed. Virtual field trips in new environments are not just about how Rather than focusing solely on how teachers perceive



the technological aspects, it should add a new dimension to the unfamiliar experience space suggested by previous research. In addition, in traditional learning environments, such as virtual learning environments, and in different conditions, students need to consider factors in the social area for smooth learning. The social component is an aspect of learning based on Vygotsky's social constructivism, which views the relationships among members of society and the elements of the learning environment as well as the relationships among the members of the learning environment and their relationships with each other as influencing learning<sup>[25-27]</sup>.

The unfamiliar experience space, first proposed by Orion<sup>[21]</sup>, did not take into account learning contexts such as virtual reality, contactless environments, etc. When a pandemic or similar situation involves a change in the learning environment from other variables outdoor learning components and conditions for enabling outdoor geology learning may need to be modified. The unfamiliar experiential space of outdoor geology learning needs to be approached anew in the context of the times and circumstances. As pre-service teachers acquire both content knowledge and pedagogical knowledge before entering the field, much of the knowledge they acquire in pre-service teacher education programs may have a significant impact on the formation of their identity as teachers. In this regard, we aimed to create an unfamiliar experience space for virtual reality-based outdoor geology learning for pre-service elementary and secondary geoscience pre-service teachers to investigate how they perceive the pre-service elementary and secondary geoscience teachers. Investigating pre-service teachers' perceptions of the unfamiliar experience space of virtual outdoor geology learning will provide a foundation for future pre-service teacher education.

Furthermore, as pre-service teachers' perceptions are likely to be projected onto the school site, it is necessary to explore how pre-service teachers perceive the components of virtual reality-based outdoor geology learning in the current context.

The purpose of this study is to explore pre-service primary and secondary geoscience teachers' perceptions of unfamiliar experiential spaces to facilitate outdoor geology learning in a time of shifting perspectives toward new learning environments, such as virtual environments. geoscience pre-service teachers.

## **2. Research methods**

### **2.1. Research procedures and participants**

#### **2.1.1. Research procedures**

The procedure for this study consisted of five steps. Firstly, a literature review and literature analysis were conducted to investigate pre-service primary and secondary teachers' perceptions of the unfamiliar experience space. Developed a questionnaire to explore the second unfamiliar experience space. The finalized questionnaire was validated and revised by a third researcher and in-service teachers. In this process, inaccuracies and unclear statements were corrected, and the finalized questionnaire was finalized. Fourthly, based on the developed questionnaire, surveys, semi-structured interviews, and data collection were conducted with primary pre-service teachers enrolled in University of Education A and secondary geoscience pre-service teachers enrolled in University of Education B. Fifthly, after all data collection was completed, the results of the survey and interviews were analyzed together to explore the perceptions of elementary and secondary pre-service teachers.

#### **2.1.2. Research participants**

This study explored the perceptions of primary and secondary pre-service teachers and was conducted among 38 primary pre-service teachers enrolled at University of Education A and 31 secondary geoscience pre-service teachers enrolled in the Department of Earth Science Education at University of B. The participants were 44 women and 25 men. The gender of the pre-service teachers was 44 females and 25 males. Of the pre-service

teachers who responded to the survey, 12 (nine secondary and three primary) were asked if they would like to participate in a follow-up interview and agreed to participate in a semi-structured, face-to-face interview.

## **2.2. Data collection**

### **2.2.1. Questionnaire**

For the survey of unfamiliar experience spaces, this study drew on elements presented in the literature [22,28], case studies and surveys conducted to explore elements of unfamiliar experience spaces in outdoor learning [25-27], a conceptual exploration of unfamiliar experience spaces in outdoor contexts [23], and a study that explored the relevance of unfamiliar experience spaces to learning [29-31]. The questionnaire was translated and adapted from a survey study [32] that explored the association between motivation and unfamiliar experiential spaces in outdoor geology exploration. One Ph.D. in science education, one doctoral candidate in science education, Two middle and high school field teachers in the metropolitan area majoring in geology, and one elementary school field teacher in the metropolitan area participated in the face validity process.

A previously developed survey questionnaire on unfamiliar experience spaces [32] was first translated into Korean. Afterward, the questions were modified to suit the Korean situation and context. In addition, the social component of unfamiliar experience space [23,25-27,30]. To add a technical component to the study, a question from previous study questions was translated and added to this [23,24]. In other words, there are five unfamiliar experience spaces that have been suggested in the literature, but no survey questions have been developed to investigate them. We translated, modified, and added questions about social and technological factors to this survey. The survey items were first translated and revised by the researcher, and then face validated with one middle school geoscience teacher, one high school geoscience teacher, one elementary school field teacher, one Ph.D. in geoscience education, and one Ph.D. candidate in science education (specializing in geoscience). Consensus was achieved through the process of modifying the sentences when there were differences in the interpretation of the survey questions in Korean, and the development of the survey questions was completed by pointing out the ambiguous or difficult-to-understand terms in consideration of the readability of the questions and supplementing the questionnaire based on this. The internal reliability coefficient (Cronbach's  $\alpha$ ) obtained in this study is 0.83.

The survey consisted of a total of 40 questions, which were answered on a Likert scale (1–5). The 40 questions were categorized into five components of outdoor learning proposed in previous studies: cognitive, geographic, psychological, social, and technological, and the order of the questions was randomly distributed. Furthermore, additional interviews were conducted to co-interpret the participants' responses and to explore their perceptions of unfamiliar experiential spaces as building blocks for outdoor geology learning through semi-structured interviews about their needs in new learning contexts such as virtual outdoor geology learning in a contactless context.

### **2.2.2. Semi-structured, non-face-to-face interview**

Twelve pre-service teachers participated in a semi-structured, face-to-face interview. The interviews were conducted virtually using zoom due to the coronavirus situation in Korea. The semi-structured interviews started with a light conversation, including individual explanations of the survey questions, and were based on two previous studies: a study of secondary pre-service geoscience teachers' perceptions of outdoor geology learning [7] and a study of elementary teachers' perceptions of virtual outdoor geology learning [33]. Based on the two previous studies, a semi-structured interview list was developed (**Table 1**). The semi-structured interviews were categorized into three areas: "Importance and value of virtual outdoor geography learning," "Experiences of virtual outdoor geography learning," and "Strategies and training for virtual outdoor geography learning." In addition, additional

questions and answers and member-checking of the written content were conducted between the researcher and study participants. The semi-structured interviews took an average of 64 minutes each.

**Table 1.** Semi-structured questionnaire list

Categorization	Question number	Question
The importance of virtual outdoor geology learning and its	1	What do you think is the most important component of virtual outdoor geology learning, and why do you think so?
	2	What do you see as the benefits and need for virtual outdoor geology learning?
	3	Have you experienced any of the emerging virtual outdoor geology learning methods (and if so, how many and examples)
Virtual outdoor geology learning experience	4	What skills do you think are necessary to participate in virtual outdoor geology learning, and why?
	5	What skills do I need to create a virtual outdoor geology lesson?
	6	What training do you think pre-service teachers need to create virtual outdoor geology lessons, and would you be interested in participating in such training if it were offered?
Strategies for virtual outdoor geology learning experience	7	As an in-service teacher, what teaching strategies would you use to implement virtual outdoor geology learning and why?
	8	How do you think virtual outdoor geology learning can impact student learning?

### 2.2.3. Data collection

Data collection was conducted among elementary pre-service teachers enrolled in University of Education A and secondary geoscience pre-service teachers enrolled in University of Education B in the academic year 2021. We are grateful to the 38 elementary geoscience pre-service students who agreed to participate in the study students (38 elementary pre-service teachers and 31 secondary geoscience pre-service teachers) who agreed to participate in the study. Of the 69 pre-service teachers who participated in the survey, 12 participants agreed to participate in semi-structured interviews (three elementary pre-service teachers and nine secondary geoscience pre-service teachers) were interviewed (**Table 2**). The researchers and study participants met face-to-face via Zoom and conducted semi-structured interviews between December 2021 and January 2022.

**Table 2.** The average and standard deviation of pre-service teachers for cognitive domain questions

Question number	Question	Mean (standard deviation [SD])
2	I know a lot about geology.	2.46(0.778)
6	I understand the geologic processes that can create different landscapes and landscapes.	3.28(0.922)
10	I understand how different kinds of rocks are made.	3.33(0.934)
12	I know what my task is while participating in an outdoor geology expedition.	3.78(0.802)
13	I can read a geologic map of the area where I am participating in an outdoor geology expedition.	3.42(0.944)
19	I understand how the landscape was formed, such as rivers and streams.	3.61(0.771)
20	I know how the places I visit on my field trips relate to the content I am learning in my field trips.	3.94(0.705)
23	I know why geologic disasters (geohazards) can happen.	3.68(0.883)
27	I understand geologic phenomena and their relationship to artifacts (non-human).	3.41(0.960)

## 2.3. Data analysis

The analysis of the survey data in this study was conducted using SPSS26.0 for descriptive statistics. The survey items were categorized by each item and the frequency and percentage of each item corresponding to each learning element were calculated to identify the characteristics of elementary and secondary pre-service teachers. Frequency and percentage analyses were used to identify trends by factor, and t-tests were conducted for each question by elementary and secondary pre-service teachers. Qualitatively analyze research-based questions about the perceptions of K-12 pre-service teachers in semi-structured interviews This study is a qualitative analysis of questions based on previous research <sup>[34,35]</sup> to explore how pre-service elementary and secondary geoscience teachers perceive unfamiliar experience spaces. The author conducted the primary statistical processing and data analysis, and the interview data were transcribed and categorized into keywords by question and then used an inductive approach <sup>[34]</sup>. After the author completed the analysis, the data were cross-checked with three people: one in-service elementary school teacher and two secondary school teachers (one middle school and one high school) majoring in geoscience, along with member-checking of the research participants who participated in the interviews.

## 3. Research results

### 3.1. Survey results

#### 3.1.1. Pre-service teachers' perceptions of cognitive domains

The results of pre-service teachers' perceptions of the first cognitive domain. *T*-tests were conducted on the distribution of scores by item and by elementary and secondary schools. From this, the tendency of the cognitive domains perceived by pre-service teachers was identified.

**Table 2** summarizes the items in the cognitive domain. The item with the lowest score per item in the cognitive domain is the question asking if the pre-service teacher knows a lot about geology. This item had the same mean value of 2 for both elementary and secondary geoscience pre-service teachers, indicating that they tended to disagree that they knew a lot about geology. The item with the highest score was "I know how the places I visit on my outdoor geology field trips relate to the content I learn on my outdoor geology field trips." This can be interpreted as pre-service teachers recognizing the relevance of what they learn on outdoor geology field trips to the content. This means that pre-service teachers can interpret what they learn from fieldwork as part of the learning process, rather than viewing it in isolation from the curriculum.

**Table 3** summarizes the *t*-test results for primary and secondary schools. All but one of the questions were statistically significant. Secondary geoscience pre-service teachers scored higher than elementary pre-service teachers on knowledge of geology, geologic processes that create natural landscapes, rock formation, literacy in fieldwork and geologic maps, relevance of fieldwork to curriculum content, explanations of natural disasters, and relationships between geologic phenomena and artifacts, with statistically significant differences.

Secondary geoscience pre-service teachers interpreted that they were relatively better equipped to learn about geology than their elementary counterparts because they were given the opportunity to learn about geological content or to take courses offered by their departments in specific disciplines (mineralogy, petrology, sedimentology, geophysics, structural geology, etc. On the other hand, elementary pre-service teachers interpreted that the requirement to learn all science subjects in general within the university of education curriculum meant that they had fewer opportunities to have a variety of experiences related to geology.

The cognitive domain is a component of the pre-service teachers' perceived acquisition of geological knowledge and is the result of an overall questionnaire that addressed the process of how much pre-service teachers know about geological elements or what and how they learn. The results are for the overall



questionnaire. In the cognitive domain, pre-service teachers' perceptions are that they do not think they know much about geology, but other than that, they know about geological elements and things related to nature and things related to our lives (natural disasters). Applications of geologic knowledge, such as the relationship to non-living objects that are encountered when learning geology, and pre-service teachers' attitudes toward outdoor geology learning positive ratings.

**Table 3.** The result of the *t*-test in which the questionnaire on the cognitive domain was classified based on elementary and secondary

Question number	Pre-service teachers		<i>t</i>	<i>P</i>
	Elementary ( <i>N</i> = 38) Mean (SD)	Secondary ( <i>N</i> = 31) Mean (SD)		
2	2.18 (0.766)	2.81 (0.654)	3.580	0.001**
6	2.84 (0.789)	3.81 (0.792)	5.039	0.000***
10	3.05 (0.899)	3.68 (0.871)	2.912	0.005**
12	3.50 (0.830)	4.13 (0.619)	3.498	0.001**
13	3.28 (0.812)	4.07 (0.688)	4.983	0.001***
19	3.47 (0.797)	3.77 (0.717)	1.630	0.108
20	3.74 (0.724)	4.19 (0.601)	2.810	0.006**
23	3.26 (0.860)	4.19 (0.601)	5.274	0.000***
27	2.97 (0.972)	3.98 (0.629)	4.958	0.000***

### 3.1.2. Pre-service teachers' perceptions of the psychological domain

Results of pre-service teachers' perceptions of the second psychological domain. The distribution of scores for each question on the psychological domain and the results of the *t*-test based on elementary and secondary schools were used to determine the tendency of pre-service teachers' perceptions of the psychological domain.

**Table 4** summarizes the scores by question. The lowest distribution of scores among the psychological domain questions was for the question about experience in outdoor geology fieldwork. The mean value of 2.38 indicates that the pre-service teachers surveyed did not have much experience. This indicates that many pre-service teachers do not have much experience with outdoor geology fieldwork. On the other hand, the two items with the highest average scores were the ones that asked "if I know the content I need to learn before I go on an outdoor geology field trip" and "if I like new places to visit for outdoor geology field trips. I like to visit new places for outdoor geology learning." The former question reflects the aspect of providing peace of mind or comfort through familiarization with the learning content, while the latter question considers the psychological discomfort or comfort of visiting an unfamiliar environment. The high mean values for both items suggest that pre-service teachers prefer to explore new places or environments for outdoor geology learning and may seek psychological comfort by exploring what they do beforehand in preparation for learning.

In addition, the results of the questions about transportation for outdoor geology learning, learning attitudes, and preference for outdoor geology questions had relatively higher mean values than other questions. In other words, pre-service teachers interpreted that they would be less psychologically uncomfortable with outdoor geology fieldwork. On the other hand, the items with relatively low scores were those related to dealing with accommodation in a different environment from home when participating in an outdoor geology field trip, time planning, etc. These findings suggest that there may be some discomfort experienced by pre-service teachers in the process of participating in outdoor geology fieldwork.

**Table 4.** The mean and standard deviation of pre-service teachers for psychological domain questions

Question number	Question	Mean (SD)
1	Most students love field trips as much as I do.	3.67 (0.869)
4	I know when it's time to eat while participating in a field geology study.	3.42 (1.020)
7	I have extensive experience with outdoor geology expeditions.	2.38 (0.941)
8	I am familiar with the field trip timeline.	2.99 (1.131)
15	I know how to behave in terms of learning attitude in the outdoor geology learning I participate in.	3.68 (0.831)
17	I have never been to the area visited in the field geology study before.	3.12 (1.065)
21	I am aware of the time spent traveling when participating in outdoor geology learning.	3.35 (1.027)
29	I easily adapt to uncertain situations and new challenging tasks in outdoor geology learning.	3.16 (0.994)
32	I am familiar with transportation to participate in outdoor geology learning.	3.75 (0.961)
34	I love new places to visit for outdoor geology learning.	3.78 (1.096)
35	I can handle critical and urgent situations that may be encountered in outdoor geology learning.	3.33 (0.902)
36	I am uncomfortable sleeping and eating in an environment different from my home.	2.68 (1.194)
37	I familiarize myself with the content to be covered before the field trip begins.	3.80 (0.867)

**Table 5** shows the results of a *t*-test between primary and secondary schools for the psychological domain. Eight of the 13 questions were statistically significant. The overall result of the eight questions is that the secondary geoscience pre-service teachers' results are statistically significantly higher than the elementary pre-service teachers. Each of these questions asks about when you eat while participating in an outdoor geology field trip, your experience with outdoor field trips, whether you know the time schedule for an outdoor field trip, your attitudes toward outdoor geology field trips, whether you have visited the field trip site beforehand, how long you spend traveling during the field trip, whether you like new field trip sites, and whether you deal with critical or urgent situations on outdoor field trips. The questions are about practical things that are commonly experienced on field trips and reflect what students familiar with field trips are likely to have experienced at least once. From these results, it can be interpreted that secondary geoscience pre-service teachers may have had relatively more experience with outdoor geology learning than elementary pre-service teachers. In particular, the question about dealing with critical or urgent situations when conducting outdoor geoscience learning is emphasized as one of the attitudes that teachers should have when conducting outdoor geoscience learning. It was interpreted that pre-service secondary geoscience teachers would be relatively more prepared. However, both secondary and elementary pre-service teachers did not have relatively high scores on this question, suggesting the need for training to handle such situations in light of safety concerns in the future.

**Table 5.** The result of the *t*-test in which the questionnaire on the psychological domain was classified based on elementary and secondary

Question number	Pre-service teachers		<i>t</i>	<i>P</i>
	Elementary ( <i>N</i> = 38) Mean (SD)	Secondary ( <i>N</i> = 31) Mean (SD)		
1	3.58 (0.948)	3.77 (0.762)	0.928	0.357
4	3.08 (0.997)	3.84 (0.898)	3.291	0.002**
7	2.03 (0.885)	2.81 (0.833)	3.738	0.000***
8	2.03 (0.885)	3.58 (1.025)	4.463	0.000***
15	3.45 (0.921)	3.97 (0.605)	2.817	0.006**
17	2.87 (0.935)	3.42 (1.148)	2.198	0.031*
21	3.08 (1.075)	3.68 (1.077)	2.500	0.015*
29	3.03 (1.052)	3.32 (0.909)	1.236	0.221
32	3.63 (0.998)	3.90 (0.908)	1.171	0.246
34	3.47 (1.179)	4.16 (0.860)	2.796	0.007**
35	3.05 (0.957)	3.68 (0.702)	3.029	0.003**
36	2.87 (1.189)	2.45 (1.179)	-1.454	0.151
37	3.92 (0.818)	3.65 (0.915)	-1.321	0.191

\**P* < 0.05, \*\**P* < 0.01, \*\*\**P* < 0.001

### 3.1.3. Pre-service teachers' perceptions of geographic areas

Results of pre-service teachers' perceptions of the third geographic domain. The distribution of scores for each question about geographical areas and the results of a *t*-test based on elementary and secondary schools.

**Table 6** summarizes the average values for the geographic region questions. The two questions with the highest results are being able to locate the places you visited on the field trip on a map and recognizing most of the field trip locations as unfamiliar. This means that pre-service teachers are not geographically familiar with the locations of the field trips, but they are geographically familiar with the locations where they have experienced field trips. On the other hand, the lowest result was "I get disoriented in new places." This means that pre-service teachers interpreted that they do not have a high frequency of geographically disoriented or lost behaviors.

**Table 6.** The average and standard deviation of pre-service teachers for geographic area questions

Question number	Question	Mean (SD)
3	I am unfamiliar with most outdoor geology locations.	3.67 (0.902)
11	I know the places and areas I will visit on my field trip.	3.46 (1.092)
14	I can find places I've visited on my field trips on the map.	3.84 (0.885)
24	I know where the north is when I'm outdoors.	3.20 (1.079)
28	I get disoriented in new places.	2.97 (1.188)

**Table 7** summarizes the results of the *t*-test, categorized by primary and secondary schools. The two questions that had statistically significant results were the one that asked students if they knew the places and areas they had visited on an outdoor geography field trip, and the one that asked students if they could

navigate to the North Iditarod outdoors. For both questions, secondary geoscience pre-service teachers scored significantly and statistically higher than elementary pre-service teachers.

Interpretation of these results is that pre-service secondary geoscience teachers have a better sense of direction in the outdoors and know the locations and areas they will visit on field trips, which may indicate that they are more familiar with outdoor geology field trips or are better prepared geographically for the locations they will visit. geographically prepared for the fieldwork. We interpreted this to mean that secondary geoscience pre-service teachers may be more familiar with or experienced in outdoor geology exploration. Being able to determine orientation in the outdoors requires prior training or at least one outdoor experience. In this respect, it can be assumed that secondary geoscience pre-service teachers will have more experience and resources for outdoor geology learning than elementary pre-service teachers.

**Table 7.** The result of the *t*-test in which the questionnaire on the geographic area was classified based on elementary and secondary

Question number	Pre-service teachers		<i>t</i>	<i>P</i>
	Elementary ( <i>N</i> = 38) Mean (SD)	Secondary ( <i>N</i> = 31) Mean (SD)		
3	3.71 (0.732)	3.61 (1.086)	-0.428	0.671
11	2.97 (1.078)	4.06 (0.772)	4.889	0.000***
14	3.68 (0.962)	4.03 (0.752)	1.645	0.105
24	2.82 (0.926)	3.68 (1.077)	3.857	0.000***
28	2.97 (1.127)	2.97 (0.972)	-0.021	0.984

\**P* < 0.05, \*\**P* < 0.01, \*\*\**P* < 0.001

### 3.1.4. Pre-service teachers' perceptions of the social domain

The fourth result of the pre-service teachers' perceptions of the social domain is the distribution of scores for each item on the social domain and the results of the *t*-test between primary and secondary schools. The social domain refers to the interpersonal elements of the outdoor learning experience, such as relationships with peers and friends, relationships with people with whom you share a sociocultural group affiliation, and relationships with family members, where you may share positive or negative feelings about the outdoor learning experience <sup>[27,36-40]</sup>.

**Table 8** summarizes the results for the social domain questions. The item with the highest mean value was "I take pictures with people who participated in an outdoor geology activity." This item reflects a typical behavior in our culture of being with people who have participated in an event, and the results show that pre-service teachers engage in this behavior. In addition, the second highest scoring item was talking about their experiences in outdoor geology with peers, which we interpreted as pre-service teachers sharing their experiences with their peers. In addition, the question about whether they talk about outdoor geology learning with their families was the third highest scoring item, which suggests that peers and family members communicate about outdoor geology learning. On the other hand, the three items with negative statements (I don't like most of my friends who come to the field trip, the instructors and administrators don't like me, and I wish I didn't attend the field trip because of my relationships with other people) had the lowest results, suggesting that the negative perceptions or images were not created because of the relationships with the people participating in the field trip.

**Table 8.** The average and standard deviation of pre-service teachers for social domain questions

Question number	Question	Mean (SD)
5	I don't like most of my friends on field trips.	1.90 (0.957)
9	Instructors and administrators who participate in field trips don't like me.	1.87 (0.873)
16	My relationship with my instructors and administrators affects my academic performance.	3.00 (1.200)
18	I talk about outdoor geology learning with my family at home.	3.75 (1.156)
22	I wish I hadn't gone on the field trip because of my relationships with other people.	1.81 (0.912)
25	I talk about my experiences in outdoor geology with my peers.	4.01 (0.883)
26	I endeavor to maintain relationships with people who participated in the expedition even after the expedition is over.	3.33 (1.010)
31	I know what to do with other students in an outdoor geology lesson.	3.75 (0.736)
33	I take a photo with the people who participated in the field geology study.	4.09 (1.011)

**Table 9** summarizes the results of the *t*-test between primary and secondary schools. Eight of the nine questions were statistically significant. For the three items with negative statements (I don't like most of my friends who come on field trips, Instructors and administrators don't like me, I wish I didn't attend field trips because of my relationships with other people), elementary pre-service teachers had higher mean values than secondary geoscience pre-service teachers, and these results were statistically significant. In other words, the results of the three items can be interpreted as suggesting that elementary pre-service teachers may have more difficulty relating to people who participate in outdoor geology learning than secondary geoscience pre-service teachers.

**Table 9.** The result of the *t*-test in which the questionnaire on the social domain was classified based on elementary and secondary

Question number	Pre-service teachers			
	Elementary ( <i>N</i> = 38) Mean (SD)	Secondary ( <i>N</i> = 31) Mean (SD)	<i>t</i>	<i>P</i>
5	2.32 (0.873)	1.39 (0.803)	-4.554	0.000***
9	2.24 (0.852)	1.42 (0.672)	-4.455	0.000***
16	2.66 (0.994)	3.42 (1.311)	2.668	0.010*
18	3.89 (1.134)	3.58 (1.177)	-1.125	0.265
22	2.26 (0.860)	1.26 (0.631)	-5.422	0.000***
25	3.76 (0.998)	4.32 (0.599)	2.877	0.005**
26	2.95 (0.985)	3.81 (0.833)	3.857	0.000***
31	2.95 (0.985)	3.81 (0.833)	3.857	0.000***
33	3.82 (1.136)	4.42 (0.720)	2.682	0.009**

\**P* < 0.05, \*\**P* < 0.01, \*\*\**P* < 0.001

The results for all but three of the five questions showed that secondary geoscience pre-service teachers had higher mean values than elementary pre-service teachers, and these results were also statistically significant. In other words, secondary geoscience pre-service teachers perceived themselves to be relatively more comfortable or relaxed in relating to and interacting with people involved in outdoor geology learning,



peers, instructors, and administrators compared to elementary pre-service teachers.

In summary, it was determined that secondary geoscience pre-service teachers would have more interaction with the social aspects of outdoor geology learning than elementary pre-service teachers.

### 3.1.5. Pre-service teachers' perceptions of technology

The results of the pre-service teachers' perceptions of the fifth technical domain are *t*-test results of the distribution of scores for the technical areas by question and categorized by primary and secondary schools. The technical domain refers to the ability to handle technical aspects in a distance learning environment, such as virtual reality-based outdoor geology learning and virtual outdoor geology learning, which is a key shift from the traditional classroom environment and essential for enhancing learning in a virtual environment <sup>[24]</sup>. For example, the slow adoption of newer technologies such as VR, AR, etc. can lead to inadequate software dissemination and technical domain barriers for school-based teachers <sup>[41]</sup>. In this sense, the technology domain is approached as an element and area where new and emerging technologies can be addressed in a virtual learning environment.

**Table 10** shows the mean values for the technical domain questions. The item with the highest mean value was the one that asked if outdoor geology learning could be used in a virtual world, and the pre-service teachers agreed that it could. In addition, the question about the need for technical skills to participate in outdoor geology learning had the second highest mean value, and the question about whether virtual outdoor geology learning could be another alternative for future social education had the third highest mean value. However, when asked if they were comfortable using new technology to engage in virtual outdoor geology learning, pre-service teachers gave answers ranging from 1 to not at all. Based on these responses, pre-service teachers tended to agree that virtual outdoor geology learning is an alternative and feasible option for future social education, and they also agreed on the need for technological skills for this purpose, but it can be interpreted that pre-service teachers are not currently familiar with handling new technologies.

**Table 10.** The mean and standard deviation of pre-service teachers for mechanical area questions

Question number	Question	Mean (SD)
30	I believe that I need mechanical skills to participate in outdoor geology learning.	3.78 (0.855)
38	I look forward to utilizing outdoor geology learning in the virtual world.	4.04 (0.865)
39	We believe that virtual outdoor geology learning will be another alternative for future social education.	3.75 (0.812)
40	I am used to dealing with new technologies by participating in virtual field trips.	1.41 (0.524)

**Table 11** summarizes the results of the *t*-test between primary and secondary. Unlike the other domains, the only domain that was not statistically significant was the descriptive domain, which means that the interpretation of the mean values per item is the same for elementary and secondary geoscience pre-service teachers.

**Table 11.** *T*-test results of classifying questionnaires in technical areas based on elementary and secondary

Question number	Pre-service teachers			
	Elementary ( <i>N</i> = 38) Mean (SD)	Secondary ( <i>N</i> = 31) Mean (SD)	<i>t</i>	<i>P</i>
30	3.84 (0.855)	3.71 (0.864)	-0.637	0.526
38	4.16 (0.789)	3.90 (0.944)	-1.221	0.226
39	3.84 (0.789)	3.65 (0.839)	-1.002	0.320
40	1.32 (0.471)	1.52 (0.570)	1.568	0.122

## **3.2. Results of the in-person interview**

### **3.2.1. Importance and value of virtual outdoor geology learning**

The importance and value of virtual outdoor geology learning is comprised of two questions: one about which components of virtual outdoor geology learning are most important to you, and the other about the benefits and necessity of virtual outdoor geology learning.

Of the components of virtual outdoor geology learning (cognitive, psychological, geographic, social, and technical), there are two main categories, organized in order of frequency, that were mentioned as most important. Cognitive was the most common, followed by technical. Of the 12 participants, seven pre-service teachers emphasized the importance of the cognitive domain, geological knowledge, four pre-service teachers emphasized the importance of the technical domain, and one pre-service teacher emphasized the importance of the social domain. The pre-service teachers who emphasized the importance of the cognitive domain emphasized the importance of geological knowledge because the purpose is to learn geology, even if it is done in virtual reality. The pre-service teachers who emphasized the importance of technology said that accessibility is the most important aspect of the program because it is based on virtual reality. Finally, one commenter emphasized the importance of the social domain by saying that since it is virtual outdoor geology learning, participants may not be controlled, may be assertive, and may have difficulties in group activities and interacting with others, so the social domain is the most important because it is based on Vygotsky's social constructivism.

When categorized by elementary and secondary pre-service teachers, all three elementary pre-service teachers emphasized the importance of geological knowledge, four secondary geoscience pre-service teachers emphasized the importance of cognitive domains, another four emphasized the importance of technical domains, and the last one emphasized the importance of social domains. The results confirmed that elementary pre-service teachers emphasized geological knowledge and cognitive domains as the most important factors, while secondary geoscience pre-service teachers perceived cognitive and technical domains as the most important factors.

The second is the benefits and need for virtual outdoor geology learning. To quantify the benefits and need for virtual outdoor geology learning, during the interviews, the authors asked participants to express the need for virtual outdoor geology learning on a Likert scale of 1 to 5. As a result, 10 out of 12 students rated the need for virtual outdoor geology learning as 5 out of 5, and two students rated it as 4. When asked about the reasons for the scores, the responses were organized in order of frequency, and based on their past outdoor geology learning experiences, they shared the difficulties they experienced during the actual field trip, such as difficulties due to the effects of the weather and loss of concentration due to individual physical fitness problems during outdoor geology learning. They said that the virtual reality-based field trip would be helpful in overcoming these challenges. Another reason was that, given the increasing educational demand for non-contact learning environments, virtual field trips are one of the best ways to engage both students and teachers in the field, while making learning more interesting. When this question was broken down by elementary and secondary pre-service teachers, elementary pre-service teachers valued the content as engaging and interesting for students in the elementary setting. and engaging learning content for students in elementary schools. Secondary geoscience pre-service teachers, on the other hand, tended to look at virtual outdoor geology as a way to implement outdoor geology learning based on their own past experiences with outdoor geology learning.

In summary, we emphasized the importance of the cognitive domain, geological knowledge, as the most important component of virtual outdoor geology learning. Pre-service teachers were also positive about virtual outdoor geology learning because it can help overcome some of the challenges of going on an actual outdoor

geology field trip, such as the effects of weather, physical conditions, and individual fitness challenges when traveling to many field sites, and because it is a new and engaging way to teach students in a virtual learning environment. The pre-service teachers had positive perceptions.

### **3.2.2. Virtual outdoor geology learning experience**

When asked about their experiences with virtual outdoor geology learning, all 12 pre-service teachers interviewed had no experience with virtual reality-based outdoor geology learning or field trips. However, one of the students interviewed had participated in a virtual reality-based science festival at her current university. Using the Metaverse platform, pre-service teachers organized a science festival that had previously been held in person in a virtual environment. We found that there was a positive perception of the virtual science festival as a new way to organize science festivals in a similar format to face-to-face. However, elementary and secondary pre-service teachers had no experience with virtual outdoor geology learning.

### **3.2.3. Strategies and training for virtual outdoor geology learning**

This categorization is about learning strategies and pedagogical perspectives as part of a pedagogical approach to investigate perceptions of virtual outdoor geology learning<sup>[33]</sup>. The first set of questions asks pre-service teachers what skills they need to engage in virtual outdoor geology learning and why. This question was asked from the perspective of a pre-service teacher who had no experience with virtual outdoor geology learning as a pre-service teacher, but rather from the perspective of a pre-service teacher who needs experience with virtual outdoor geology learning. When asked about the skills needed to engage in virtual outdoor geology learning, the most frequent response from pre-service teachers was the ability to be comfortable with new technology. The reason for this is that since they are participating in virtual outdoor geology learning, they have to participate in outdoor expeditions not in a face-to-face environment, but through non-face-to-face, VR, AR, and other devices and equipment that are unfamiliar to them, so the pre-service teachers emphasized the importance of their ability to handle the devices and technical aspects of the expedition. The next most frequent response is the importance of being able to interact. For example, because it is a virtual field trip, it is expected that there will be a great deal of autonomy between the instructor and the student or between the student and the instructor, so it is important to be able to interact with the instructor or with others, such as in group activities, rather than doing something alone. This emphasized the importance of being able to interact with others, such as in group activities.

This question is designed to get a second teacher's perspective on the most important considerations for implementing virtual outdoor geology learning. 'What skills do you need to create a virtual outdoor geology lesson? From this question, we investigated pre-service teachers' perceptions of what they need as teachers to create and engage students in virtual outdoor geology learning. The results showed that all participants emphasized the importance of the technical aspects of implementing virtual reality.

Creating a virtual outdoor geology course is not something that pre-service teachers are familiar with and have never done before, so it is even more challenging to create one yourself. In light of this, exploring the skills needed to implement virtual outdoor geology learning, and most importantly, the skills required to implement it, may be a good place to start. In terms of the skills needed to create virtual outdoor geology lessons, all 12 pre-service teachers indicated that they needed to be able to use technical programs to implement virtual reality and be able to handle technical aspects. The reason for this is that if you think about conducting a field geological survey in virtual reality, you need to consider how you can organize it and teach it to your students. In this regard, pre-service teachers said that the most important skill in practice is the technical ability

to create virtual reality.

The third question was asked from the perspective of a pre-service teacher: “What training do you think is needed at the pre-service teacher training level to create virtual outdoor geology lessons? If such a training was offered, would you be interested in participating?” All 12 pre-service teachers responded that they would like to be trained in a program that allows them to implement virtual reality. In the same vein as the second question, respondents emphasized the importance of technology and the need for appropriate training at the pre-service teacher training stage to implement it.

The fourth question was, “What teaching strategies would you utilize when implementing virtual outdoor geology learning? What teaching strategies would you need as an in-service teacher to implement virtual outdoor geology learning? Explain why.” While in all previous questions, pre-service teachers were able to express their ideas freely, more than half of the pre-service teachers had difficulty answering this question about teaching strategies. Some pre-service teachers were unable to provide additional answers because they were unsure. However, here are two examples, one from a secondary geoscience pre-service teacher and one from an elementary pre-service teacher, who struggled with teaching strategies. Secondary pre-service teachers agreed that the most important teaching strategies for virtual outdoor geology learning were repeated observations and finding regularities. Since the teaching method called virtual outdoor geology learning and the new environment may not be familiar to both teachers and students, it is important to be able to make repeated observations and derive some regularity from them in order to continue learning in new environments and conditions. One of the advantages of virtual outdoor geology learning is that you can observe a lot of things without the constraints of physical space, and in this regard, it was suggested that repeatedly observing a lot of things in a virtual space with fewer physical constraints and deriving regularities could be a good teaching strategy. On the other hand, pre-service elementary teachers said that they needed to think more about how to keep students engaged, focused, and not distracted when teaching in virtual reality, rather than teaching strategies. Considering that both teachers and students have little experience with classes held in virtual reality, it was thought that there would be many difficulties in holding classes on-site with elementary school students if the students were not in control, so there was an opinion that they would establish a teaching strategy considering how to control the students even though it was held in virtual reality. In addition, although the course is conducted in virtual reality, it is clear that more attention is paid to how the course can be taught in a given learning environment than to actual geological knowledge, such as student management and safety.

The fifth question is how virtual outdoor geology learning might ultimately benefit or impact students. How do you think virtual outdoor geology learning will impact students’ learning? The author’s expectation was that the question would have a vaguely positive effect on prospective teachers and the students who participated in it. In response, secondary geoscience pre-service teachers most often said that the learning effects of virtual outdoor geology learning would be positive for students in terms of being able to observe things that are difficult to observe in real field trips, being able to check their learning repeatedly, being able to participate in learning in a virtual space, and being able to learn efficiently. In addition, respondents commented on the applicability of virtual outdoor geology learning to other areas of the earth sciences, such as astronomy, oceans, atmosphere, and so on, noting that they expect students to benefit from the application of educational programs that can be utilized in a virtual environment. In another example, one of the secondary geoscience pre-service teachers said that her future students would benefit from virtual reality lessons. For example, in the past, astronomy was experienced indirectly with stellariums, but more recently, astronomy has become a direct experience with the Universe Sandbox, field teachers’ personal blogs, Space Engine, Theasys 360, and other programs that directly apply to astronomy, as well as indirectly, such as the use of simulations created by field



teachers at schools, and educational programs that can be used in other non-face-to-face environments. In terms of student engagement in virtual outdoor geology learning, pre-service teachers reported that they expected positive impacts in terms of student interest, fun, and motivation to learn, and positive learning outcomes for students in terms of experiencing something new and technological in virtual reality. To summarize, we expected that virtual outdoor geology learning would have positive learning effects in terms of observing or repeating observations that are difficult to experience in real field trips, learning efficiency, dealing with technical aspects in a new learning environment, and attitudes, interest, and motivation toward learning.

#### **4. Conclusion and recommendations**

The purpose of this study is to explore the perceptions of elementary and secondary geoscience pre-service teachers about unfamiliar experiential spaces as a condition for enabling outdoor geology learning and a component of outdoor learning. Moreover, in the current era of emphasizing non-face-to-face learning environments, overcoming the limitations of the unfamiliar experience space proposed by Orion <sup>[21]</sup> and defining an unfamiliar experience space that meets the emerging situation of virtual outdoor geology learning and investigating their perceptions of it may be meaningful as a basis for educating pre-service teachers in the future. To this end, we categorized the unfamiliar experience spaces presented by outdoor geology learning into five categories and explored their meanings through a survey, and further approached the value and importance of virtual outdoor geology learning, experience, strategies for virtual outdoor geology learning, and educational aspects through additional recent interviews.

The cognitive domain of the study explored the importance of geological knowledge as perceived by pre-service teachers. In the psychological domain, we explored the factors that may be familiar or uncomfortable in outdoor geology learning based on pre-service teachers' experiences. In the geography section, it was difficult to interpret that they had a lot of geographical information about the outdoor geology field trip locations, but they showed geographical information and familiarity with the locations they had experienced. In the social domain, they showed the possibility of interacting with people participating in outdoor geology, instructors, fellow students, administrators, and family members, and finally, in the technical domain, they showed that virtual reality-based outdoor geology could be an alternative teaching method in the future, and that they were not realistically prepared for it. Furthermore, the semi-structured interviews revealed that pre-service teachers had no experience with virtual outdoor geology learning to date. Although they did not have any experience with virtual outdoor geology learning to date, they were positive about the need for and value of virtual outdoor geology learning and interested in teaching and learning strategies for implementing virtual outdoor geology learning in the future. Based on these findings, the following conclusions were reached.

The first unfamiliar experience space of outdoor geology learning considered only the cognitive, psychological, and geographical domains of field trips. On the other hand, with the high demand and interest in non-face-to-face learning environments, it is necessary to define a new unfamiliar experience space for virtual outdoor geology learning. Reflecting this, this study redefines the unfamiliar experience space as a total of five elements: cognitive, psychological, geographical, social, and technological.

The results of the second survey showed statistically significant results for elementary pre-service teachers and secondary geoscience pre-service teachers in all four domains except the technical domain. This may ultimately be due to differences in resources for outdoor geology learning among secondary pre-service teachers compared to primary pre-service teachers. In other words, we hypothesized that secondary geoscience pre-service teachers would have a quality difference in terms of information and resources related to outdoor



geoscience learning, such as more information and opportunities to engage in lessons, than elementary pre-service teachers.

The third elementary pre-service teacher and secondary geoscience pre-service teacher had no experience with virtual outdoor geology learning, but the perceptions of the unfamiliar experience space revealed that they had positive perceptions of the need for and value of virtual outdoor geology learning and the potential for future alternative instruction. It was emphasized that there should be another training at the pre-service teacher training stage to improve the technical skills of pre-service teachers in order to take into account the need and demand for training to utilize virtual outdoor geology learning for educational purposes in schools in the future. In other words, the need for appropriate training at the pre-service teacher training stage to implement or teach virtual outdoor geology learning was raised.

From the three conclusions of this study, we recommend the following.

Firstly, this study is of academic significance as it proposes a new and unfamiliar experience space for outdoor geology learning in the context of the current emphasis on distance learning environments. In other words, based on the existing unfamiliar experience space proposed by Orion<sup>[21]</sup>, many studies related to outdoor geology learning have been conducted in Korea, and we propose a follow-up study on outdoor geology learning and virtual outdoor geology learning that can be conducted in a non-face-to-face environment based on the newly defined unfamiliar experience space.

Secondly, this study is based on a new learning condition, virtual outdoor geology learning, which is an emerging subject matter in a contactless learning environment, so there are limitations in generalizing to learning in a contactless learning environment. In addition, there are limitations in terms of the participants of the study, which cannot be claimed to be representative of all elementary and secondary pre-service teachers. However, we are approaching virtual outdoor geology learning as one of the new curricula that can be applied in a non-face-to-face learning environment. It approaches an unfamiliar experiential space by exploring the basic conditions needed to enable it. This study's exploration of pre-service elementary and secondary geoscience teachers' perceptions of unfamiliar experience spaces suggests the need for new educational programs to investigate the training and skills needed at this stage of pre-service teacher preparation so that they can be used pedagogically in the future.

## 5. Summary

The purpose of this study was to investigate the perceptions of Novelty Space among elementary and secondary geoscience pre-service teachers. To this end, 38 elementary pre-service teachers from University A and 31 secondary pre-service geoscience teachers from University B participated in the survey. We also conducted face-to-face interviews with three elementary pre-service teachers and nine secondary geoscience pre-service teachers who agreed to participate in additional interviews, for a total of 12 participants. In addition to prior knowledge (cognition), prior outdoor learning experience (psychology), and familiarity with the outdoor study area (geography), we added social and technical factors to the unfamiliarity with the space. When categorized by primary vs. secondary and grade level, there were statistically significant differences in the cognitive, psychological, geographic, and social domains for elements of the unfamiliar experience space. The statistical difference may be due to the fact that secondary geoscience pre-service teachers have more experience or capital related to outdoor learning than elementary pre-service teachers than their elementary counterparts. In the semi-structured interviews, both elementary and secondary pre-service teachers emphasized the value or need for virtual outdoor geology learning, particularly in the area of technology. This study is of academic

significance in that it not only suggests the need to redefine the unfamiliar experience space for implementing outdoor geology learning for pre-service elementary and secondary geoscience teachers in light of the current educational context but also specifies the elements of the unfamiliar experience space.

## Disclosure statement

The author declares no conflict of interest.

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# Research on the Development Path of Shenzhen Elderly Education from the Perspective of Positive Aging

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**Abstract:** With the increase in China's aging population, elderly education as an important social policy is gradually receiving attention. This article takes the perspective of positive aging as the theoretical framework and takes Shenzhen as the research object to explore the development path of elderly education in Shenzhen under the background of positive aging. Through literature review and field research, the current situation and problems of the development of elderly education in Shenzhen were analyzed, and corresponding development strategies and suggestions were proposed. Research has found that the development of elderly education in Shenzhen has made certain achievements, but still faces many challenges. It requires the joint efforts of the government, society, and families to build a comprehensive elderly education system, promote the comprehensive development of the elderly, and achieve the goal of positive aging.

**Keywords:** Positive aging; Shenzhen; Elderly education; Development paths

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## 1. Introduction

Population aging is a common population structure problem faced by countries around the world in the 21st century, and China's population aging problem is more prominent and severe. In the next three decades, in the process of comprehensively promoting the great rejuvenation of the Chinese nation with the Chinese path to modernization, the issue of population aging is a major practical issue that needs our continued attention and response. In this context, the concept of positive aging has gradually been proposed and incorporated into national development strategies. As an important way to promote the comprehensive development of the elderly, elderly education is of great significance in improving their quality of life and promoting social harmony and stability.

As a cutting-edge city in China's reform and opening up, Shenzhen has seen a gradual increase in the number of elderly people with the continuous progress of technology and society. The demand for knowledge and skills among the elderly is also growing, and the demand for elderly education is becoming increasingly prominent. As an important social industry, elderly education has received much attention. In the current



context of high-quality economic and social development, the research on the development path of elderly education in Shenzhen can not only promote the learning participation and social integration of the elderly, but also provide references and guidance for promoting a good atmosphere of respecting and caring for the elderly in the whole society. At the same time, the research on the development path of elderly education in Shenzhen also has important practical significance for improving China's elderly education system and promoting the comprehensive construction of a modern country in society.

With the intensification of population aging, elderly education has become one of the focuses of social attention, and scholars at home and abroad are increasingly exploring the development path of elderly education. Wang constructed an elderly education model with "education for the elderly" as the core, encouraging the elderly to actively learn knowledge and skills and participate in social activities <sup>[1]</sup>; Yuan used MLOGIT regression statistical method to construct an impact mechanism on the survival status of the elderly, and proposed reasonable suggestions for positive aging <sup>[2]</sup>; Zhou conveyed a positive and healthy lifestyle concept from the perspective of elderly people learning music and opera, promoting the formation of a positive outlook on elderly care <sup>[3]</sup>; Li *et al.* constructed a demand model for elderly education from the perspective of demand, and proposed supply side optimization strategies to address the current challenges faced by elderly education <sup>[4]</sup>; Fan <sup>[5]</sup>, Sun and Wang <sup>[6]</sup>, and Wu <sup>[7]</sup> proposed development paths for elderly education from the perspectives of lifelong education and positive aging, respectively, in response to the challenges brought by population aging; Xie conducted text analysis from multiple perspectives using relevant software based on the CNKI database, pointing out the characteristics and future research directions of elderly education in China <sup>[8]</sup>; Li explored the supply side reform of elderly education by taking Shenzhen Changqing University for the Elderly as an example to address the supply-demand contradiction in elderly education <sup>[9]</sup>; Zhao analyzed the current challenges in elderly education and believed that exploring and innovating new models of elderly education is a long-term issue for improving elderly education <sup>[10]</sup>. It can be found that research on elderly education mainly focuses on policy formulation, educational methods, educational content, etc. At the same time, some scholars have explored the development path of elderly education in Shenzhen from the perspectives of innovation in educational methods and stimulation of elderly learning interests. This study aims to explore the development path of elderly education in Shenzhen and provide theoretical support and policy recommendations for promoting the healthy development of elderly education and the comprehensive development of the elderly. This is of great significance for promoting the sustainable development of elderly education in Shenzhen.

## **2. Analysis of the current development status of elderly education in Shenzhen from the perspective of positive aging**

### **2.1. The development history of elderly education in Shenzhen**

As one of the forefront cities of China's reform and opening up, Shenzhen's development process of elderly education is closely related to the city's economic and social development. Elderly education in Shenzhen started relatively late, but with the joint efforts of the government and various sectors of society, it has made significant progress. The development of elderly education in Shenzhen can be traced back to the late 1980s and early 1990s, when Shenzhen, as an economic special zone, began to attract a large number of migrant population, including some elderly people. This has also led to the gradual highlighting of Shenzhen's demand for elderly education.

After entering the 21st century, Shenzhen's elderly education has ushered in new development opportunities. The government has begun to increase investment and policy support in elderly education,

actively promoting the development of elderly education. At the same time, a large number of volunteers and professionals who pay attention to elderly education have emerged in society, injecting new vitality into the development of elderly education. With the arrival of an aging society, the development of elderly education in Shenzhen has gradually shown characteristics of diversification and specialization.

In recent years, the trend of digitalization and intelligence in the development of elderly education in Shenzhen has become increasingly evident. The emergence of various online elderly education platforms has provided more convenient and diverse learning paths for the elderly. Meanwhile, traditional forms of elderly education are constantly innovating and improving, such as offering diverse courses and organizing various activities. These measures not only enrich the cultural life of the elderly but also add more delight to their later years.

## **2.2. The connotation and characteristics of Shenzhen elderly education from the perspective of positive aging**

The introduction of the concept of “positive aging” provides a new perspective for the development of elderly education in Shenzhen. From this perspective, elderly education is no longer simply about imparting knowledge and skills, but focuses more on the comprehensive development needs of the elderly, promoting them to maintain a positive and healthy lifestyle in their later years.

Shenzhen’s elderly education emphasizes personalization and diversity from the perspective of positive aging. The needs of the elderly population are diverse, and elderly education should provide personalized learning content and methods based on the characteristics and needs of different groups to meet their diverse learning needs. Shenzhen’s elderly education focuses on promoting social participation and self-realization among the elderly from a positive aging perspective. Elderly education is not only to inherit knowledge, but also to guide elderly people to participate in social activities, expand their social relationships, enhance their social adaptability, and achieve self-realization and social integration of the elderly. Shenzhen’s elderly education emphasizes health promotion and psychological care from a positive aging perspective. The physical and mental health of the elderly is an important goal of elderly education. The education content should include the cultivation of health knowledge and healthy lifestyle, while also paying attention to the psychological health needs of the elderly, providing psychological support and care services.

Shenzhen’s elderly education is characterized by personalization, social participation, health promotion, and psychological care from a positive aging perspective. It is committed to providing comprehensive learning and development opportunities for the elderly, promoting their active and healthy participation in social life, and achieving their comprehensive development and happy old age.

## **2.3. The current situation and problems of the development of elderly education in Shenzhen**

At present, there are still many problems with the development of elderly education in Shenzhen, which is relatively lagging, mainly manifested in the following aspects: the coverage is not broad enough, and the level of popularization needs to be improved; there are also certain problems with the curriculum and teaching quality. Some elderly education institutions have a single curriculum, uneven teaching quality, and lack specificity and interest, which needs further optimization and improvement; the teaching staff also urgently needs to be strengthened. The professional level of the elderly education teaching staff is uneven, and there is a lack of teaching methods and strategies for elderly learners. Strengthening the construction of the elderly education teaching staff and improving their professional literacy and teaching level is crucial for the development of Shenzhen’s elderly education. There are also problems with teaching resources and facilities.

Some elderly education institutions lack teaching resources and have severely aged facilities, which cannot meet the needs of elderly learners. It is necessary to increase investment in elderly education, improve teaching resources and facilities, create a good learning environment, and promote the sustainable development of elderly education in Shenzhen.

Shenzhen's elderly education still faces many challenges and problems in terms of coverage, curriculum design, teaching staff, and teaching resources. Only by deeply analyzing the current situation, identifying the problems, and taking effective measures to solve them, can we promote the development of elderly education in Shenzhen towards a healthier and more positive direction.

### **3. Positive aging policies and practical references at home and abroad**

#### **3.1. Positive aging policies abroad and their inspiration**

Some foreign countries have introduced multiple active aging policies, providing useful references for other countries. For example, as a highly aging society, Japan's long-term care insurance system provides comprehensive long-term care services for the elderly, which inspires the development of elderly education in Shenzhen. The "gig hour" policy implemented in Germany encourages elderly people to continue working, providing them with more opportunities to participate in society. This policy has reference significance in promoting active participation of elderly people in social life. The "Elderly Employment Training Program" in the United States provides vocational training and reemployment opportunities for the elderly, which helps to extend their career and has certain reference significance for the development of elderly education in Shenzhen. The positive aging policies and practices abroad have provided rich experience and inspiration for the development of elderly education in Shenzhen, which can provide useful references for China's policy formulation and practice in this area.

#### **3.2. Case analysis of positive aging practices in China**

In terms of case analysis of positive aging practices in China, an in-depth exploration can be conducted using the elderly education project in Shanghai, China as an example. As a region with a severe aging population in China, Shanghai has actively responded to national policies and proposed a series of elderly education development projects. Shanghai has attracted a large number of elderly people to participate in the construction of elderly education bases, providing various courses and activities such as health preservation and handicraft making. A personalized learning plan has been developed for different age groups and interests, focusing on the needs and psychological characteristics of the elderly. In terms of faculty construction, Shanghai actively introduces professional elderly education talents to improve teaching quality and service level. At the same time, we also pay attention to the cooperation between elderly education and communities and enterprises, carry out various forms of courses, promote cross-border integration, and provide broader learning opportunities for the elderly. In terms of evaluation, Shanghai has established a scientific assessment system, regularly evaluating and adjusting elderly education projects to ensure their continuous and effective operation. These measures provide useful references for other regions in China to actively engage in aging practices and have positive significance for promoting the development of elderly education.

#### **3.3. The inspiration of positive aging policies and practices at home and abroad on elderly education in Shenzhen**

At the policy level, some developed countries abroad actively promote the development of elderly education in terms of aging policies. For example, Japan promotes the concept of "lifelong learning" and encourages elderly

people to participate in various learning activities. Countries such as France and Canada have also introduced special education subsidy policies for elderly people to encourage them to actively participate in learning. The implementation of these policies provides valuable experience for Shenzhen's elderly education.

At the practical level, some cities both domestically and internationally have actively explored the development path of elderly education, providing valuable experience for Shenzhen. For example, Shanghai has carried out various elderly education activities in communities, including cultural courses and the popularization of health and wellness knowledge, providing useful insights for Shenzhen to build an elderly education system. Some foreign cities have also carried out diversified practical explorations in elderly education, such as the "Elderly University" project in the United Kingdom, which provides higher education and cultural activities for the elderly and provides reference values for the development of elderly education in Shenzhen.

The inspiration for positive aging policies and practices at home and abroad for Shenzhen's elderly education is mainly reflected in policy support and practical experience. On the basis of drawing on domestic and foreign policies and practical experience in elderly education, Shenzhen can formulate policy measures that are more in line with local realities to promote the sustainable and healthy development of elderly education.

## **4. Development path of elderly education in Shenzhen**

### **4.1. The vision of Shenzhen's elderly education from the perspective of positive aging**

In the development of elderly education in Shenzhen, the vision from the perspective of positive aging is to build a comprehensive, diverse, and inclusive elderly education system, providing richer and more quality learning opportunities for the elderly. Firstly, the vision of Shenzhen's elderly education is to achieve the comprehensive development of the elderly, not only focusing on imparting knowledge and skills, but also on cultivating their physical and mental health, interests, and hobbies, so that they can obtain happiness and satisfaction in learning. Secondly, the vision of Shenzhen's elderly education is to promote the social integration and participation of the elderly, break their loneliness through educational activities, enhance their social interaction ability, and enable them to better integrate into social life. Lastly, the vision of Shenzhen's elderly education also includes promoting the self-realization and social responsibility of the elderly, guiding them to give back what they have learned to society, and contributing wisdom and strength to social development. By realizing these visions, Shenzhen's elderly education will become a model in the field of national and even global elderly education, making positive contributions to building a positive aging society.

### **4.2. Strategic planning for the development of elderly education in Shenzhen**

In terms of strategic planning for the development of elderly education in Shenzhen, it is necessary to fully recognize the importance of positive aging, that is, to view the elderly as a positive resource and important component of society, in order to formulate targeted policy measures. The purpose and goals of the development of elderly education in Shenzhen should be clearly defined, which is to enhance the cultural literacy, skill level, and mental health of the elderly through education and training, so that they can be more fulfilling and meaningful in their later years. When formulating strategic plans, it is necessary to fully consider the characteristics and needs of the elderly population in Shenzhen, and tailor education projects and services that meet the actual needs of the elderly population in Shenzhen from a practical perspective. In the process of promoting the development of elderly education, it is necessary to strengthen cooperation with all sectors of society, form a good mechanism of government leadership, social participation, and self-management of the elderly, and jointly promote the sustainable development of Shenzhen's elderly education. At the same time, it is necessary to establish a sound evaluation mechanism, timely monitor and evaluate the strategic planning for



the development of elderly education in Shenzhen, continuously improve and adjust measures, and ensure the smooth implementation and practical results of the development path of elderly education in Shenzhen.

### **4.3. The construction and implementation of the development path of elderly education in Shenzhen**

In terms of constructing and implementing the development path of elderly education in Shenzhen, it is necessary to establish a sound policy system. The government should formulate relevant policies and regulations, clarify the development goals, priority areas, and security measures of elderly education, and provide policy support and guarantees for the development of elderly education in Shenzhen. We also need to strengthen the construction and integration of elderly education resources, including the establishment of elderly education learning centers, training institutions, community learning points, etc., to meet the diverse learning needs of the elderly. The construction of the teaching staff is also important, and it is necessary to strengthen the training of professional senior education teachers and management personnel to improve the quality of education and teaching. In the process of constructing and implementing the development path of elderly education in Shenzhen, attention should also be paid to cooperation and co-construction with various sectors of society. The government can cooperate with enterprises, social organizations, etc. to jointly promote the development of elderly education, and achieve resource-sharing and complementary advantages. At the same time, attention should be paid to carrying out publicity and promotion work, enhancing society's awareness and participation in elderly education, and creating a good social atmosphere. In addition, in the construction and implementation of the development path of elderly education in Shenzhen, it is necessary to strengthen the establishment of supervision and evaluation mechanisms, establish a sound assessment and evaluation system, timely identify and solve problems, and ensure the sustainable and healthy development of elderly education. The construction and implementation of the development path of elderly education in Shenzhen require active participation and cooperation from the government, various sectors of society, and the elderly themselves. Only through joint efforts from multiple parties can Shenzhen's elderly education industry move towards a new stage of healthier and more comprehensive development.

## **5. Evaluation of the development effectiveness of elderly education in Shenzhen**

### **5.1. Establishment of Shenzhen elderly education development indicator system**

In the process of evaluating the effectiveness of elderly education development in Shenzhen, it is crucial to establish a comprehensive indicator system. The indicator system for the development of elderly education in Shenzhen should comprehensively consider multiple factors to objectively evaluate the development of elderly education. Firstly, indicators can be established from the perspective of educational resource investment, including government funding and the construction of elderly education facilities, to evaluate the level of attention and support for elderly education in Shenzhen. Secondly, the actual effectiveness and influence of elderly education can be evaluated by considering the curriculum design and coverage, including course types, course quality, number of beneficiaries, etc. Thirdly, the construction of the teaching staff for elderly education can be considered, including indicators such as teacher level, teacher structure, and teacher training, to evaluate teaching quality and sustainable development capabilities. Fourthly, considering that the participation and satisfaction of elderly students are also an important part of the evaluation index system, relevant data can be obtained through survey questionnaires, interviews, and other methods. Establishing a scientifically sound indicator system for the development of elderly education in Shenzhen will help to comprehensively evaluate the effectiveness of elderly education and provide strong support for the sustainable and healthy development of



elderly education in Shenzhen.

## **5.2. Evaluation method for the effectiveness of Shenzhen's elderly education development**

In terms of evaluating the effectiveness of elderly education development in Shenzhen, it is necessary to choose the appropriate evaluation method based on the actual situation. In terms of qualitative evaluation, methods such as in-depth interviews and focus group discussions can be used to communicate with elderly students, educational institution leaders, and other relevant personnel to understand their views, gains, and expectations on elderly education, in order to evaluate the impact and significance of elderly education in practice. In terms of quantitative evaluation, it can be considered to establish an indicator system, including data on academic performance, participation level, satisfaction survey, and other aspects of elderly students. At the same time, methods such as questionnaire surveys can be used to statistically analyze the age, education level, health status, and other information of elderly students, as well as their changes after participating in elderly education, in order to objectively evaluate the actual effectiveness of Shenzhen's elderly education. At the same time, it is necessary to comprehensively use qualitative and quantitative evaluation methods, combined with on-site observation, literature analysis, and other means, to comprehensively evaluate the development effectiveness of Shenzhen's elderly education, and provide strong support for the sustainable development of Shenzhen's elderly education in the future.

## **5.3. Analysis of the evaluation results of the development effectiveness of elderly education in Shenzhen**

In the process of evaluating the effectiveness of elderly education development in Shenzhen, it is necessary to conduct a comprehensive analysis of all aspects. Through a survey and statistical analysis of the coverage rate of elderly education in Shenzhen, the effectiveness of elderly education policies in actual implementation and the level of social recognition of elderly education can be evaluated. At the same time, the evaluation of participation is also crucial, and the actual effectiveness of elderly education projects can be evaluated by investigating indicators such as participation enthusiasm, learning enthusiasm, and satisfaction of elderly learners. By analyzing the diversity, professionalism, and practicality of Shenzhen's elderly education curriculum, it is possible to evaluate whether elderly learners can obtain substantial knowledge and skill enhancement. At the same time, the evaluation of teaching quality is also crucial. The teaching effectiveness and actual influence of elderly education projects can be evaluated by observing the teaching staff, teaching facilities, and teaching methods of elderly education. By evaluating the social benefits, we can evaluate the physical and mental health, social integration, and life satisfaction of elderly learners, in order to reflect the positive impact of elderly education on society. The evaluation of sustainable development is also extremely important, and the sustainability and development prospects of Shenzhen's elderly education projects can be evaluated from aspects such as government policy support, social investment, and long-term operating mechanisms. Through the analysis of the evaluation of the effectiveness of the development of elderly education in Shenzhen, a comprehensive evaluation of the development of elderly education in Shenzhen can be conducted, providing a strong basis and reference for future policy formulation and practical promotion.

## **6. Conclusion and outlook**

### **6.1. Research conclusion**

As a cutting-edge city in China's reform and opening up, the development of elderly education in Shenzhen not only concerns the quality of life of the local elderly population, but also has a demonstrative and leading

role, which has reference significance for the elderly education industry in other regions. The main conclusions drawn from the research on the development path of elderly education in Shenzhen are as follows. Firstly, with the intensification of population aging, elderly education in Shenzhen is facing important opportunities and challenges for development. The government should increase investment in elderly education, establish and improve relevant policies and regulations, and promote the sustainable development of elderly education. Secondly, from international experience, elderly education plays an important role in promoting a positive aging process. Shenzhen can learn from advanced foreign experiences and explore paths suitable for the development of local elderly education based on local conditions. Thirdly, Shenzhen's elderly education should focus on diversified development, providing diverse learning opportunities and methods to meet the needs of different groups of elderly people. At the same time, it should focus on cultivating the independent learning ability of elderly people, stimulating their interest and potential in learning. Fourthly, the development of elderly education in Shenzhen requires the joint participation and support of all sectors of society. Schools, communities, families, and relevant institutions should strengthen cooperation to jointly promote the development of elderly education and contribute to the construction of a positive and healthy elderly society.

## **6.2. Future prospects and suggestions for the development of elderly education in Shenzhen**

At the policy level, the government can increase investment in elderly education, establish a more comprehensive policy and regulatory system, and promote the sustainable development of elderly education. We can strengthen the integration of elderly education and industry, promote the deep integration of elderly education with industries such as employment, entrepreneurship, health, and elderly care, and achieve multi-dimensional development of elderly education. We can also strengthen the construction of the teaching staff for elderly education, improve the professional level and teaching quality of the teaching staff, and provide higher-quality educational resources for elderly learners.

In the future, we can also explore the development of digital elderly education. With the continuous progress of information technology, digital elderly education will become the future development trend. The government and society should increase support and guidance for digital elderly education and improve the digital literacy and information acquisition ability of elderly learners. At the same time, we can also pay attention to international exchanges and cooperation in elderly education, draw on advanced elderly education models and experiences from abroad, and promote the international development of elderly education in Shenzhen.

Shenzhen's elderly education is facing both development opportunities and severe challenges from the perspective of positive aging. Through efforts in government support, industry integration, faculty building, digital development, and international cooperation, Shenzhen's elderly education will usher in a broader development space and contribute to promoting China's elderly education to a higher level.

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# Subtitle Translation of Chinese Elements in View of Cultural Translation: A Case Study of *Ne Zha: I Am the Destiny*

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**Abstract:** Guided by Bassnett's cultural translation theory, this paper probes the strategies and methods used in subtitle translation of film and television productions containing Chinese elements. Taking the translation of lines from *Ne Zha: I Am the Destiny*, it analyzes the language expressions of Chinese tradition and categorizes the methods of dealing with cultural elements in the translation process. The aim is to elevate the translation quality of film subtitles from a cultural perspective, facilitating better communication between the original-language films and target-language audiences, and promoting cross-cultural exchanges.

**Keywords:** Cultural translation theory; Subtitle translation; Chinese elements; *Ne Zha: I Am the Destiny*

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## 1. Introduction

With the global promotion of Chinese film and television and the fast-paced growth of the global industry, films serve as a vital tool for cultural dissemination and promoting Chinese traditions abroad. To enhance global understanding of China, modern communication methods should be utilized to promote our culture effectively. Prioritizing subtitle translation is crucial for maximizing the cultural dissemination impact of films and television. Unlike other forms of literary translation, subtitle translation requires instantaneity, colloquialism, and conciseness<sup>[1]</sup>. Film plots often contain unique cultural connotations of different ethnicities and nations. Additionally, in different social environments and cultural backgrounds, each language produced will entail different meanings and artistic effects. At the same time, subtitle translation is extremely important for presenting excellent Chinese aesthetics to overseas markets, which is not only a linguistic conversion but also a cultural transplantation based on the cultural translation theory. Therefore, for Chinese culture to “go global” through the dissemination of domestic films, conducting research on subtitle translation is imperative.

Differences in thinking logic and language between Chinese people and those of other countries have led to cultural barriers, which hinder mutual understanding. *Ne Zha* is a 110-minute film based on a traditional

Chinese mythological story. It contains various Chinese dialects, extremely catchy adages, names of famous ancient Chinese characters, and other words with Chinese characteristics, all of which show Chinese aesthetics and spirits. From a superficial perspective, film subtitles possess characteristics of brevity, colloquialism, and dissemination; moreover, from a profound perspective, they need to portray character personalities while considering contextual contrasts.

## 2. Theoretical framework

Considering that this thesis is designed for the subtitle translation of the animated film *Ne Zha* through Susan Bassnett's cultural translation theory, the theoretical research areas involved in this paper will include studies on subtitle translation, Chinese elements, and cultural translation theory.

### 2.1. Subtitle translation

Subtitle translation, serving as a medium for film dissemination, bridges the communication gap between different cultures. Typically, subtitle translation refers to interlingual translation, wherein dialogue and necessary visual information from the film are translated into the target language and overlaid at the bottom of the screen while preserving the original audio. The characteristics of film and television language include its audibility, comprehensiveness, immediacy, accessibility, and lack of annotation <sup>[2]</sup>.

In the West, European scholars pioneered film and television translation research. Istvan Fodor, a key figure, conducted groundbreaking work in 1976, exploring dubbing and translation from semiotic, linguistic, and aesthetic perspectives. He emphasized achieving synchronization in sound, characters, and content, laying the theoretical groundwork for this field <sup>[3]</sup>.

In the 20th century, supported by the European Union, film and television research flourished alongside advancements in science, technology, and language awareness in Europe. Ivarsson's 1992 work marked Europe's first comprehensive study on subtitle translation, offering theoretical insights and practical strategies, especially under new technologies <sup>[4]</sup>. Henrik Gottlieb, a prominent figure in film and television translation, introduced ten subtitle translation methods, integrating linguistics into the field <sup>[5]</sup>.

In the 21st century, with the development of mass media, the study of film and television translation is flourishing in the West. The number of papers related to film and television translation published in well-known international translation journals is increasing, the research field is broader, and the content is more in-depth. In addition, international seminars on film and television translation have become increasingly frequent.

Compared with the West, the research on subtitle translation in China started relatively late but has made a breakthrough in the past decade. Many scholars have summarized the linguistic characteristics of film and television translation from their own practice and explored the principles and skills of subtitle translation.

### 2.2. Chinese elements

Chinese elements are a broad concept, with the five-thousand-year civilization of the Chinese nation being one of its important components. Generally, Chinese elements are more present in various aspects of Chinese philosophy, ideology, politics, economy, culture, education, and institutions. However, the most subtle influence lies in the cultural-loaded words. In the practice of Chinese-to-English translation, culture-loaded words have always been a long-standing translation challenge.

In the 1960s, following the "cultural turn" in translation studies, vocabulary containing cultural elements became the focus of scholars' attention. Various scholars have given different names to such vocabularies, such as culturally loaded words <sup>[6]</sup>, cultural words <sup>[7]</sup>, culture-specific items <sup>[8]</sup>, and culture-specific concepts <sup>[9]</sup>. This



concept was first proposed domestically by Xu, who also discussed the relationship between culture-loaded words and English teaching. Therefore, this thesis adopts the term “cultural-loaded words” proposed by Xu to refer to “文化负载词”(wenhuafuzaici).

Regarding the classification of culture-loaded words, the most classic classifications abroad were proposed by Nida and Newmark. Newmark categorized culture-loaded words into five major types: body language and customs, ecological culture, social culture, institutional customs, and material culture<sup>[7]</sup>. Nida, based on cultural factors, divided culture into five major categories: linguistic culture, ecological culture, material culture, religious culture, and social culture<sup>[10]</sup>. Domestic scholars often further refine the classification of culture-loaded words, mainly due to the profound and extensive history of Chinese culture. Chinese culture-loaded words, or Chinese elements, often possess extremely rich cultural connotations or functions.

In Chinese-to-English translation, Chinese elements are often reflected in culture-loaded words, and the translation and classification of culture-loaded words highly depend on the content of the text itself.

### 2.3. Cultural translation theory

From the 1920s to the 1960s, linguists analyzed translation issues from the perspectives of semiotics, semantics, descriptive linguistics, and pragmatic linguistics but struggled to tackle literary translation challenges. By the mid-20th century, scholars acknowledged the significance of cultural factors, paving the way for cultural translation theory. Early researchers like Eugene Nida and Rostislav Apod initiated discussions on the language-culture relationship.

During the 1970s, the polysystem theory was introduced by Israeli academic Itamar Even-Zohar, emphasizing the interaction between different cultures and the constraints imposed by systemic relationships<sup>[11]</sup>. Translation, as a form of cultural exchange, should be placed within the cultural context to consider cultural differences. This provides a new perspective for translation theory, driving research in Western translation theory beyond the textual level to encompass cultural, historical, social, and political dimensions. In 1976, the Literary Translation Conference was held in Leuven, marking the establishment of Translation Studies as an independent discipline. In the 1980s, Mary Snell-Hornby first proposed the concept of “cultural turn,” which linked “external literary factors” with “translation choices and their role in literary systems”<sup>[12]</sup>. In her view, the focus of translation should be on cultural transfer rather than linguistic transfer. Her translation perspective challenged the traditional notion based on linguistic transfer. During this period, scholars of the cultural school were not seeking linguistic equivalence, but rather placing translation within the broader context of social history and complex power structures, exploring the process of cultural transmission<sup>[13]</sup>. This “cultural turn” had a profound impact on scholars, particularly on pioneers like Susan Bassnett and André Lefevere who deepened the concept of “cultural turn.”

The 1980s witnessed a cultural turn in translation studies. Susan Bassnett, a leading advocate of the cultural translation school and a British scholar, believes that translation is not merely a linguistic act but also involves the cultural system in which the language operates<sup>[14]</sup>. Bassnett, building on Snell-Hornby’s theory, emphasized the shift in translation studies toward cultural focus rather than textual analysis. Translation, she argued, transcends linguistic transfer and should prioritize cultural understanding. In *Translation, History, and Culture*, co-edited by Bassnett and Lefevere, they advocated for considering cultural functional equivalence in translation<sup>[15]</sup>. Based on these findings, they established the cultural translation theory, which directs translation studies toward historical and cultural perspectives.

Up to this day, the cultural translation theory is aimed at explaining and understanding the impact of cultural differences during translation, as well as proposing solutions to mitigate their effects. According to Qiyi

Liao, culture-loaded words are words, phrases, and idioms that are only found in a certain culture, and refer to the unique ways of activities that a certain nation gradually accumulates over the long course of history, which are different from other nations <sup>[16]</sup>. Cultural translation theory is pivotal for understanding and bridging cultural gaps in the translation process, aiding in more scientific cultural transmission and exchange. The essence of it mainly encompasses the following four points:

- (1) Translation should not remain solely at the linguistic level; instead, it should consider culture as the translation unit.
- (2) The purpose of translation is to overcome barriers caused by language differences and facilitate cultural exchange.
- (3) The nature of translation lies in the cross-cultural transmission of the original message, rather than merely decoding and encoding.
- (4) The essence of translation lies in cultural transplantation and integration. Translators should not be content with describing the original text but should strive to achieve cultural equivalence in the target language culture. Additionally, Bassnett emphasizes that the principles and norms of translation are constantly changing and vary in their requirements across different historical periods <sup>[14]</sup>.

### 3. A case study on *Ne Zha*

The Chinese elements portrayed in *Ne Zha* serve as a window into the study and dissemination of traditional Chinese culture through cultural translation theory. Among the various classifications of cultural elements, the classification criteria proposed by Nida are the most widely applied and can comprehensively cover various cultural factors, making them suitable for categorizing Chinese elements in *Ne Zha*.

Moreover, *Ne Zha*, adapted from *The Investiture of the Gods*, portrays the legendary defiance of fate by its protagonist, Nezha. The film encompasses rich Eastern cultural elements like Taoism, Confucianism, and Buddhism with cultural values. These culturally loaded words, specific to the source culture, typically lack direct equivalents in the target culture, rendering their translation notably difficult <sup>[17]</sup>. Hence, analyzing *Ne Zha*'s subtitle translation sheds light on translation strategies in original domestic animated films.

Therefore, based on Nida's classification and Bassnett's cultural translation theory, this chapter divides Chinese elements into five major categories: ecological culture, material culture, social culture, religious culture, and linguistic culture. Taking the English translation of *Ne Zha* as an example, translation analysis is conducted based on different types of culturally loaded words and textual contexts.

#### 3.1. Ecological cultural elements

Ecological cultural elements, also known as ecological cultural-loaded words, reflect the natural and geographical environment, climatic conditions, and characteristics of certain linguistic communities. They represent the relationship between humans and nature and the ecological environment, including plants, animals, mountains, rivers, cities, towns, and the associated connotations <sup>[18]</sup>. The ecological cultural elements in *Ne Zha* are often translated concisely by transliteration.

(1) ST: 那就是你拯救陈塘关，名正言顺成为灵珠之时。

TT: Then you will rescue *Chen Tang Pass* and claim your birthright as the Spirit Pearl.

In the novel *The Investiture of the Gods*, “陈塘关” (*chentangguan*) is depicted as a significant pass, where a treasure has been passed down since the time of the Yellow Emperor, and it is also the birthplace of Nezha and the place where Nezha's family resides. However, due to geographical and historical differences,

some audiences have little knowledge of *The Investiture of the Gods*, and there are no corresponding place names in Western geography. According to Bassnett, for readers from different language backgrounds to have a similar experience with both texts, the cultural function of the translated text should match that of the original. Furthermore, he also points out the inherent untranslatability between languages, and the appropriateness of transliteration and literal translation to preserve the original language and culture is highlighted. Additionally, although “陈塘关” (*chentangguan*) holds unique historical and cultural significance for Chinese audiences, it does not significantly impact the plot or historical background of the movie. Therefore, in such circumstances, transliterating and literally translating it as “Chen Tang Pass” ensures readability and meets the requirements of intralingual coherence most effectively.

(2) ST: 乾元山金光洞

TT: The Cave of Golden Light

“乾元山金光洞” (*qianyuanshanjinguangdong*) is a secluded place hidden in the mountains, traditionally believed to be the awakening place of Taiyi Zhenren. Sichuan province in southwest China is where “乾元山” (*qianyuanshan*) is situated at present. The name of this place originates from the shining golden light it emits, so retaining the original meaning of the name and directly translating it as “the Cave of Golden Light” preserves the cultural characteristics of the original text. However, it is worth noting that there is a case of omission in this translation, as the information about “乾元山” (*qianyuanshan*) was overlooked by the translator. This may be due to space limitations in the subtitle display, leading to only the central meaning of the word being translated, while retaining the cultural characteristic with the most significance.

### 3.2. Material cultural elements

Material culture elements are material cultural-loaded words created by people in specific time and language communities, including tools, transportation, daily necessities, musical instruments, food, medicine, clothing, and measurements. They reflect a tangible culture that exists in concrete forms. In the film *Ne Zha*, there are numerous unique virtual material terms related to mythology. These material culture elements are difficult to find corresponding words in Western culture, and the same objects are inclined to stimulate varied connotations among individuals hailing from diverse cultural heritages.

(3) ST: 我们来踢毽子如何?

TT: How does playing *jianzi* sound to you?

Originating from the Han Dynasty’s “蹴鞠” (*cuju*) in China, “毽子” (*jianzi*), typically made of feathers and metal coins, is a game tool unique to Chinese culture. It is a traditional game and sport played by kicking with hands or feet with over 2000 years of history. Additionally, the film itself provides a sufficient visual depiction of it, offering ample contextual information for overseas audiences. Therefore, transliterating it as “*jianzi*” directly preserves the cultural information of the source language, enabling overseas audiences to understand this Chinese sport, transplanting this characteristic culture of China into English culture, and promoting cultural output.

(4) (a) ST: 风火轮

TT: A flaming chariot

(b) ST: 火尖枪

TT: A fire-tipped spear

(c) ST: 混天绫

TT: The Chaotic Silk

“风火轮”(fenghuolun), “火尖枪”(huojianqiang), and “混天绫”(huntianling) are all Taoist treasures bestowed upon Nezha by Taiyi Zhenren. Taoism serves as both the origin and core of the entire story in the movie. Therefore, employing a literal translation method preserves its cultural essence without hindering audience comprehension. For instance, “火尖枪”(huojianqiang) is translated directly as “A fire-tipped spear” since it resembles a spear. “混天绫”(huntianling), representing a fabric with extraordinary power, is translated into “The Chaotic Silk” to convey its magnificence. However, the translation of “风火轮”(fenghuolun) neither reflects Chinese elements nor conforms to English culture. The term “风火轮”(fenghuolun) comes from the fact that when Nezha rides on them, the left wheel creates wind while the right wheel produces fire, similar to wearing a pair of roller skates that accelerate forward. This analogy is more recognizable to Western audiences. Hence, according to the cultural translation theory, “A flaming chariot” encompasses the Chinese cultural essence of this term and effectively conveys its literal and cultural meanings to English-speaking audiences.

### 3.3. Social cultural elements

Distinct societies possess their own historical backgrounds, social systems, political traits, and cultural ambiances. Influenced by these factors, indigenous social-cultural terms arise, encapsulating customs, lifestyles, education systems, and more. In contrast to material cultural elements, these terms denote intangible cultural elements. The social culture-loaded word acts as the catalyst for societal cultural dynamics, which encompasses the intricacies of individuals’ daily routines and interpersonal interactions<sup>[19]</sup>.

(5)(a) ST: 多谢师尊栽培。

TT: You can count on me, *master*. Thank you so much.

(b) ST: 我是你的师叔。

TT: I’m your *master’s peer*!

China’s rich cultural heritage emphasizes respect for teachers, with terms like “师尊”(shizun) and “师叔”(shishu) carrying nuanced meanings. While “师尊”(shizun) denotes the Supreme Lord and “师叔”(shishu) refers to disciples, their English equivalents, “master,” lack such distinction. In Western culture, “uncle” is typically reserved for blood relatives. Chinese cultural norms emphasize refined forms of appellation more than Western norms, potentially confusing audiences regarding character relationships. To ensure accuracy, translators should consider characters’ identities and relationships, opting for suitable English equivalents such as “grandmaster” to refer to “师尊”(shizun) so as to convey hierarchical differences.

(6)(a) ST: 李大人，仙长还不施法吗？

TT: Your *highness*, the immortal’s spell must be cast soon!

(b) ST: 大人啊，你救得了哪吒一时救不了一世。

TT: *Milord*, ultimately, your sacrifice would just go to waste.

In ancient China, “大人”(daren) typically referred to adults with power or status in society, often used to show respect or address elders and authoritative figures, including members of the imperial family, nobility, and officials. “Highness” in English-speaking countries is apt to refer to royal members, especially princes or princesses, and other direct relatives of queens or kings. However, Jing Li is only the deputy commander of Chen Tang Pass, who has no familial relationship with the emperor. Therefore, in (a), the translation of “大人”(daren) is incorrect; but in (b), “Milord” is a respectful term in English for noblemen or individuals with status,



encompassing both nobility and officials. Through this term, cultural equivalency is maintained, facilitating overseas audiences to better understand the relationships between characters.

### 3.4. Religious cultural elements

Religious cultural elements comprise words associated with a nation's religious beliefs and ideologies, which reflect the unique religious faith and mindset of a specific ethnic group. Chinese culture has been deeply influenced by Buddhism, Taoism, and Confucianism over millennia, which engage in mutual dialogue while also integrating with each other, exerting a profound and lasting impact on the Chinese nation's ideology and spirit as well as generating a plethora of culturally loaded words with distinct religious connotations. In *Ne Zha*, religious cultural elements predominating in the film's subtitles are primarily rooted in Taoist culture.

(7) ST: 师尊早已跳出三界外。

TT: The Supreme Lord entered a realm beyond *the three worlds*.

Taoism has three different interpretations of “三界” (*sanjie*): the heavens, earth, and humanity; the heavens, earth, and water; and the desire realm, form realm, and formless realm. While the concept of it can be interpreted on three levels, Taoism believes that beyond the scope of “三界” (*sanjie*), one can transcend life and death, reaching a state of carefree longevity. However, in the translation above, “三界” (*sanjie*) is translated directly as “the three realms.” The cultural information inherent in “三界” (*sanjie*) is completely omitted, as the translator chooses to avoid addressing the cultural gap, leaving the target audience unfamiliar with Taoist culture confused. Peiji Zhang interprets “跳出三界” (*tiaochusanjie*) as “make a clean break with this mortal world”<sup>[20]</sup>. Due to the difficulty of translating Taoist culture, Peiji Zhang also struggles to accurately convey its religious color, but in terms of movie subtitles, his translation seems more appropriate.

(8) ST: 你就在这图中跟我学习昆仑仙术吧。

TT: You can spend every day here learning *the Immortal magic of Kunlun* with me.

Originating from Mount Kunlun in western China, “昆仑” (*kunlun*) holds significance as a prominent mountain in Chinese mythology. It serves as the backdrop for numerous mythological tales. “昆仑” (*kunlun*) transitioned into a term within Chinese Taoism over time, representing a distinct sect or branch. Within Taoist lore, “昆仑仙术” (*kunlunxianshu*) emerges as a prevalent concept, embodying the mystical practices of immortal cultivation. This notion is frequently encountered in various mythological narratives and folk legends, denoting the supernatural abilities of immortality. Jin suggested transliteration through Chinese Pinyin in traditional Chinese cultural translation preserves the essence of Chinese tradition and linguistic style<sup>[21]</sup>. In line with this recommendation, the translator opts for the transliteration of “Kunlun” and the literal translation of “the immortal magic,” which explains the nature and name of the faction, thereby enriching the cultural fidelity of the translation and its reception.

(9) ST: 日月同生，千灵重元，天地无量乾坤圈。急急如律令。

TT: With the power of sun and moon, of sea and sand, Qiankun Hoop, obey my command.

The spell “急急如律令” (*jijirulvling*), originally a bureaucratic term, evolved into a Taoist talisman used by sorcerers for immediate effect. In *Ne Zha*, its cultural complexity mirrors incantations in the *Harry Potter* Series, understood only by wizards. The translator opted for a free translation to ease audience comprehension while maintaining subtitle principles. Viewers quickly understand its summoning function for the Qiankun Hoop and its potent force, aligning with the film's visuals and sound. This approach achieves cultural



equivalence, transmitting nuanced meanings to English-speaking audiences and fulfilling the subtitle's purpose effectively.

### 3.5. Linguistic cultural elements

Linguistic cultural elements refer to stable expressions formed during the development of a language, as well as the various differences between this language and those of other countries and ethnic groups. For example, in the Chinese language system, there are numerous four-character phrases, idioms, colloquialisms, proverbs, dialects, etc. These linguistic cultural-loaded words are often concise yet rich in connotation. Furthermore, due to constraints in the length and space of subtitles, translation presents even greater challenges.

(10) ST: 你打我撒，你打我撒。

TT: Hit me now. I dare ya!

This line is an authentic Sichuan dialect spoken by Taiyi Zhenren, which greatly enhances the comedic effect of the film. Furthermore, the line carries a strong sense of provocation, with “撒” (*sa*) serving as a particle in the Sichuan dialect. In the translation, “ya” serves as a colloquial expression for “you” or “your,” and “dare” implies challenging or provoking someone to do something. Translating “你打我撒” (*nidawosa*) as “I dare ya” effectively captures the linguistic correlation in both English and Chinese. Additionally, the vowel of the dialect word “撒” (*sa*) is faithfully rendered in the translation as “ya,” achieving phonetic conformity while preserving the original meaning and provocative tone. Therefore, when translating dialect words into English, it is beneficial to frequently employ such colloquial equivalents, using informal expressions or truncations, to both accommodate the language patterns of the target audience and retain the original dialect characteristics.

(11) ST: 我定千里来相会

TT: I will come from *wherever I am*.

Under these circumstances, “千里” (*qianli*) does not literally mean one thousand miles but figuratively signifies a remote distance. Classical Chinese texts and idiomatic expressions often employ figurative language, where terms like “三” (*san*, three), “九” (*jiu*, nine), “千” (*qian*, thousand), “万” (*wan*, ten thousand), mostly convey figurative rather than literal numbers. Therefore, it is inappropriate to simply translate it word-for-word as “one thousand miles”; instead, it should be interpreted based on the figurative usage of the expression. This translation does not confine itself to a literal equivalence but effectively grasps the figurative meaning of “千里” (*qianli*), demonstrating the semantic change. Moreover, it accurately conveys the cultural significance of the idiomatic expression in conjunction with the narrative context of the film.

(12) ST: 关在府里无事干，翻墙捣瓦摔瓶罐，来来回回千百遍，小爷也是很疲倦。

TT: These dumb walls crush my soul. Even prisoners get parole. No friends, no fun, it's just the worst. Hopefully boredom will get me first.

This is a doggerel sung by Nezha to reflect his loneliness due to his demonic nature and busy parents. In this example, the original text consists of four lines, with each line rhyming at the end. The translator also renders it into four lines, with each line ending in a rhyme. At the same time, in the translation process, the imagery is appropriately adjusted to better suit the associative meanings of English. For example, “小爷” (*xiaoye*) here refers to Nezha's arrogant self-reference, implying his indulgence; however, “little lord” in the Western context simply emphasizes the social status of a child or young male, without the connotation of self-reference. Therefore, the translator adeptly uses psychological imagery like “my soul” to convey Nezha's

loneliness, employing free translation to elucidate the true meaning of the four lines. This approach underscores Nezha's emotional state and ensures audiences grasp the poem's essence and context.

## 4. Conclusion

Drawing from Bassnett's theory on cultural translation, this paper utilized a methodological approach centered on textual analysis to explore the translation of Chinese elements in the subtitles of *Ne Zha: I Am the Destiny*. By categorizing cultural-loaded words into five categories, this paper conducted a case study to facilitate the absorption of this film around the world for those interested in traditional Chinese culture. The objective was to enhance the audience's appreciation of the distinct allure of Chinese culture and facilitate the propagation of its cultural essence.

To begin with, as a unique cultural medium, film plays a crucial role in cultural dissemination. Subtitles not only convey language but also cultural nuances. It is crucial to realize that translating Chinese elements in subtitles differs from books due to time and space constraints, and translators must avoid diverting attention or asynchronous audiovisual phenomena. Therefore, traditional methods like footnotes are impractical. Generally, ellipsis and transliteration are common for brevity. Secondly, subtitles cater to diverse audiences, requiring universally understood expressions for cultural-loaded words. Thirdly, visual information in films can complement subtitle translation. When the audience can fully grasp the meaning of a scene, linguistic and cultural-loaded words can be omitted. In subtitles, it is a favorable choice to omit one or two words if they do not affect the plot significantly. For instance, in *Ne Zha*, translating “乾元山金光洞” (*qianyuanshanjinguangdong*) as “The Cave of Golden Light” is an appropriate omission. Fourthly, translators should regard the cultural environment of the entire film as a cohesive entity. For example, the prominence of Taoist culture is evident in *Ne Zha*. However, these religious cultural terms do not have direct counterparts in English. When dealing with such translations, translators should employ various translation strategies such as domestication and explanation to translate religious cultural elements, aiming to maintain cultural equivalence. Transliteration becomes the primary method for translating material and environmental cultural-loaded words in subtitle translation so as to preserve cultural significance. Additionally, cultural equivalence can be achieved to some extent through literal translation or transliteration combined with literal translation. Overall, subtitle translation should prioritize the understanding and acceptance of the target language readers, selecting appropriate translation strategies and methods based on their cultural context.

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# Exploration of the Blended Learning Model in English Major Education at Private Applied Universities

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**Abstract:** The integration of the blended learning model in the curriculum of English majors at private applied universities is a strategic response to the evolving demands of higher education. This study explores the potential of blended learning to augment learning outcomes and the overall educational experience. By combining traditional classroom instruction with online learning tools, the model seeks to offer a more flexible and resource-rich environment that can foster student engagement and initiative, thereby promoting a well-rounded development of English language skills and cultural competencies. The research delves into the practical implementation of the blended learning model, examining how it can be tailored to meet the specific needs of English majors. It discusses the integration of technology into the curriculum, the importance of faculty training, and the creation of an interactive and personalized learning experience. The study also emphasizes the need for continuous assessment and feedback mechanisms to ensure the model's effectiveness. Furthermore, the research highlights the importance of cultivating English talents with practical capabilities, innovative abilities, and an international perspective. It underscores the role of blended learning in preparing students for the global job market by providing them with the necessary language proficiency and cultural understanding.

**Keywords:** Private applied undergraduate; English major; Blended learning model

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## 1. Research background

To build a comprehensive high-quality educational development system, the state encourages and supports the operations of private colleges and universities. This approach promotes the diversified development of higher education, catering to the needs of students at different levels, across various fields, and of different types. Consequently, it enriches the connotation and expands the scope of higher education. As an essential component of China's higher education system, private colleges and universities have reached a new stage of integration and innovation. They have fully embraced the successful experiences of both domestic and international public and private institutions. The "Implementation Regulations of the People's Republic of China on the Promotion of Private Education" clearly stipulated how to standardize the quality of operations and plan for the future

development of private colleges <sup>[1]</sup>.

According to data from the Ministry of Education released on March 1, 2023, there are 167,200 private schools of all types at all levels nationwide, including 789 private colleges and universities. Private applied universities, characterized by their applied, vocational, and industrial educational focus, closely align their curriculum with industry needs. This alignment enhances students' practical skills and boosts their employment competitiveness. Their primary objective is to cultivate applied and technical talents who can offer professional technology and services, thereby contributing to socioeconomic development and industrial upgrading. With the introduction of the "Education Informatization 2.0 Action Plan," learning methods characterized by the "Internet+" era, such as ubiquitous learning and real-time remote collaborative learning, are continuously emerging <sup>[2]</sup>. This evolution expands the teaching environment and transforms learning methods and resources. "China's Education Modernization 2035" outlines accelerating educational reform in the information age as one of the ten strategic tasks for educational reform.

## 2. Domestic and international research status

The exploration of the blended learning model within the realm of English major education at private applied universities has emerged as a prominent topic in educational research. This is particularly due to the ongoing advancements in information technology and the progressive nature of educational reform. The blended learning model, often referred to as "Blended Learning," is an educational approach that leverages the strengths of both traditional, face-to-face instruction and online distance education. It enables students to acquire knowledge and skills through conventional teaching methods while simultaneously gaining access to a broader array of learning resources and more interactive experiences provided by the online learning environment.

### 2.1. Domestic research

In recent years, researchers have delved into the blended learning model within college English major education, yielding numerous valuable insights. For example, Na *et al.* discovered that students engaged in the blended learning model experienced a remarkable improvement of over 50% in their English listening and speaking skills, whereas those taught traditionally saw only a 10% improvement <sup>[3]</sup>. Zhong *et al.*, in their comparative study of blended learning versus traditional teaching methods, observed that students utilizing the blended learning model enhanced their English proficiency by more than 20%, compared to a mere 5% increase for those in traditional classes <sup>[4]</sup>.

Furthermore, the pedagogical strategies employed within the blended learning model significantly influence students' learning outcomes. In a comparative analysis of learning outcomes under various teaching strategies, Ma *et al.* determined that students who employed PBL (Problem-Based Learning) and TBLT (Task-Based Language Teaching) within the blended learning framework achieved the most favorable results <sup>[5]</sup>. Conversely, those who adopted the PPP (Presentation-Practice-Production) approach had the least successful outcomes.

### 2.2. International research

The blended learning model has been extensively researched and adopted in higher education institutions worldwide. In the United States, this model predominantly integrates online learning with in-person instruction, empowering students to autonomously select learning methods to achieve personalized and self-directed education. This is largely facilitated by technological advancements, including online platforms, virtual classrooms, and digital textbooks, which diversify content and enhance teaching flexibility. Australia is



recognized as a leader in blended learning, emphasizing a fusion of online and traditional in-person teaching. Distinct from the United States approach, the Australian model places a greater focus on fostering students' self-directed and interactive learning experiences <sup>[6]</sup>.

Online platforms enable students to engage in learning at their convenience, while also promoting interaction with educators and peers to bolster academic performance and engagement. Canada's approach to blended learning is characterized by its diversity, utilizing a range of media such as videos, comics, and games to enrich educational content, thereby making the learning process more dynamic and engaging. In the United Kingdom, the blended learning model is also prevalent, combining online and face-to-face instruction through online platforms and a suite of educational technologies, which encourages students to actively explore and engage in the learning process.

### **3. Issues in the teaching model of English majors at private universities**

Private applied universities constitute a significant element of China's higher education framework. Nevertheless, the implementation of traditional blended learning models encounters several challenges and issues:

- (1) Teaching design issues: The challenge lies in crafting a curriculum that aligns with blended learning objectives and caters to student needs. This includes making informed decisions regarding the content, format, and pacing of each phase within the blended learning process.
- (2) Teaching model integration: There is a need to harmoniously blend traditional teaching methods with blended learning approaches to leverage their combined strengths. This effort aims to prevent an over-reliance on electronic technology and to enhance the overall effectiveness of teaching.
- (3) Teaching resource utilization: It is crucial to maximize the use of various teaching resources essential for blended learning. This includes digital materials, online platforms, and self-study tools, ensuring rich and varied educational content.
- (4) Teaching management issues: Establishing a robust system of teaching management policies is essential to oversee the seamless execution of the teaching process and to maintain the quality of student learning experiences within a blended environment.
- (5) Teacher training and support: There is a necessity to equip educators with the skills to effectively navigate the blended learning model. This involves enhancing their proficiency in information technology and fostering their innovative capabilities to boost teaching quality.
- (6) Teaching evaluation issues: Developing a rigorous evaluation framework for blended learning is imperative. This system should provide a comprehensive assessment of the teaching process, outcomes, and quality, offering insights to guide the continuous refinement of blended learning practices <sup>[7]</sup>.

### **4. Cultivating innovative talents in English majors at private applied universities**

As society progresses and the role of English in international communication becomes ever more significant, traditional English teaching models are confronted with several challenges. These include low student engagement, inadequate pedagogical efficacy, and the use of overly abstract content that does not adequately address the needs of learners. Consequently, there is an urgent need to investigate and adopt more effective instructional approaches. This paper addresses the existing issues in current research on English major teaching models by delving into the following areas of inquiry.

#### **4.1. Theoretical research on blended learning models**

As information technology advances rapidly, there is a corresponding increase in students' demand for a variety of learning methods and instructional tools. The blended learning model encapsulates the strengths of both traditional and online teaching, catering to diverse student learning needs and enhancing both the effectiveness and efficiency of the learning process. Secondly, the blended learning model enhances the utilization of educational resources. Traditional face-to-face teaching is often constrained by limitations in time, space, and faculty availability, which can hinder the full exploitation of teaching resources.

In contrast, the blended learning model leverages technological tools, such as online teaching platforms, to digitize teaching materials. This facilitates the sharing and interaction of teaching resources across both online and offline environments, thereby boosting the efficiency and efficacy of teaching. Furthermore, the blended learning model also fosters the professional development of educators. Teachers can utilize online platforms and other technological resources to continuously refine their instructional methods and skills. This ongoing enhancement leads to a higher quality and more impactful teaching experience.

#### **4.2. Research on teaching design of blended learning models**

Teaching design is central to the effectiveness of the blended learning model. When designing a blended learning curriculum, it is imperative to establish clear educational goals, delineate the knowledge and skills students should acquire, and predict the learning outcomes. It is equally important to consider the diverse needs and abilities of students to create customized teaching plans. Below are descriptions of several widely adopted blended learning models:

- (1) Flipped classroom model: This approach requires students to review and engage with course material through an online platform before class. Class time is then dedicated to interactive discussions, collaborative problem-solving, and in-depth exploration under the guidance of the teacher.
- (2) Inverted classroom model: In this model, teachers offer direct instruction and support during class sessions, while students undertake homework assignments and self-directed learning activities on an online platform post-class, allowing for a more personalized learning pace.
- (3) Blended online learning model: By combining the structure of traditional in-person teaching with the flexibility of online learning, this model allows students to study course material at their convenience via an online platform. This flexibility is complemented by focused class sessions for discussions and exploration, enhancing the depth of understanding.
- (4) Station rotation model: In this model, students are organized into groups that sequentially rotate through different learning stations. At each station, they engage in a variety of activities, such as direct instruction, peer collaboration, and online learning, fostering a multifaceted educational experience.
- (5) Hybrid course model: This model effectively merges face-to-face teaching with online learning components. A portion of the course content is delivered online, often asynchronously, allowing students to learn at their own pace, while the remaining content is taught in a traditional classroom setting, promoting direct interaction and immediate feedback.

#### **4.3. Research on teaching strategies of blended learning models**

Teaching strategies are pivotal to the success of the blended learning model and significantly influence students' learning outcomes. Both domestic and international researchers have extensively explored strategies within the realms of classroom instruction, online learning, and self-directed study, proposing several viable

approaches. When devising strategies for the blended learning model, the following factors must be taken into account:

- (1) Teaching resources and technical support: The model necessitates that students have unrestricted access to online learning resources at all times and places. It also requires the provision of user-friendly educational technology tools to facilitate the seamless operation of the blended learning environment.
- (2) Students' learning habits and motivation: The blended learning model presupposes a degree of self-directed learning capability among students. It is essential to foster students' self-learning habits and motivation, enabling them to engage in the learning process proactively, actively seek knowledge, and consequently enhance their learning outcomes.
- (3) Teaching management and supervision: Effective management and oversight are crucial for the blended learning model. Educational institutions should establish robust teaching management systems to monitor the quality of instruction and learning achievements. They must also foster close interaction with students to promptly address any issues or challenges they encounter.

#### **4.4. Research on teaching evaluation of blended learning models**

Teaching evaluation is a fundamental component of the blended learning model, critically important for enhancing students' learning outcomes and elevating the quality of instruction. Researchers globally have delved into the intricacies of teaching evaluation, which encompasses assessing students' learning achievements and the effectiveness of teachers' instructional methods. They have proposed several effective evaluation techniques, including assessments aligned with learning objectives and reflective assessments that encourage introspection and self-analysis.

To thoroughly assess the blended learning model, a multidimensional approach is necessary, considering the following aspects:

- (1) Student learning outcomes: These are paramount in evaluating the success of the blended learning model. It is essential to evaluate the breadth of knowledge acquired, the proficiency in skills, the level of motivation, and the attitudes toward learning that students exhibit throughout the educational process.
- (2) Teacher teaching quality: The pedagogical methods and strategies employed, the comprehensiveness of the teaching content and resources, and the efficacy of teaching management and oversight are all crucial factors in assessing the quality of instruction.
- (3) Teaching resources and technical support: These are pivotal to the seamless operation of the blended learning model. The resources include digital textbooks, online courses, interactive exercises, video tutorials, and virtual labs. Technical support encompasses the infrastructure of network equipment, electronic devices, multimedia tools, and software applications. These elements are instrumental in facilitating the educational activities of both educators and learners.

**Table 1** shows designing the blended learning model based on the “dual-subject” concept, combining the issues existing in the blended learning model at private applied universities, and integrating the above four dimensions. It summarizes the various stages of teacher and student behavior in the teaching process <sup>[8]</sup>.

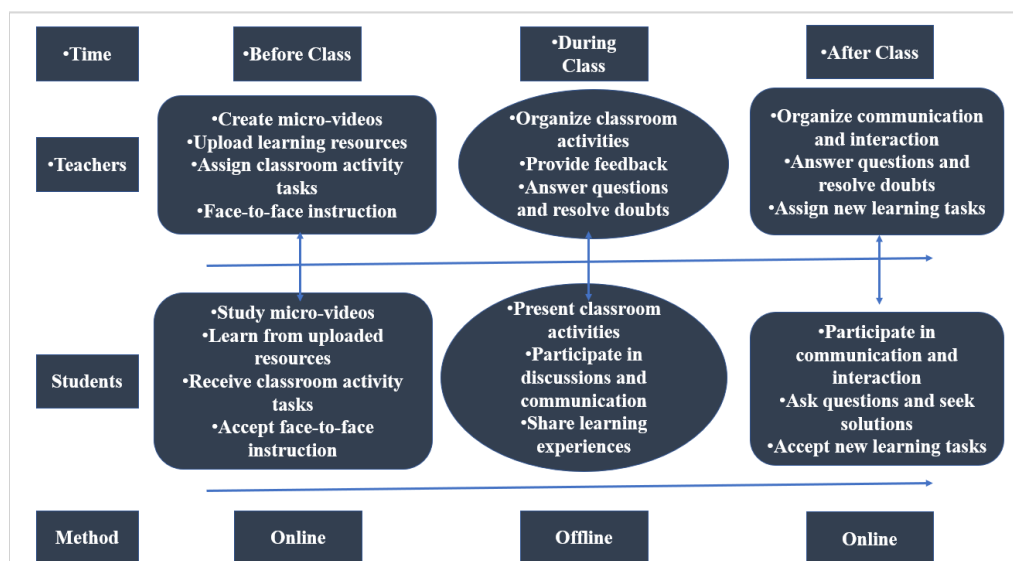
**Table 1.** The leading role of teachers and the main role of students in blended learning

Blended learning model dimensions	Teacher behavior				Student behavior	
	Course preparation	Entire teaching		Function	Online	Offline
		Online	Offline			
Teaching theory research	Object analysis	Problem feedback	Key knowledge	Supervision	Autonomous learning	Listening to lectures
Teaching design research	Goal analysis	Supervision & guidance	Difficult issues	Evaluation	Discovering issues	Participating in discussion
Teaching strategy research	Implementation pathways	Answering questions and resolving doubts	Common issues	Reflection	Discussion and consultation	Critical reflection
Teaching evaluation research	Resource determination	Correcting homework	Exam and assessment	Optimization	Completing homework	Review and summary

It is also important to consider the following:

- (1) Continuous improvement: The evaluation process should not be static but rather iterative, with feedback loops that inform ongoing enhancements to teaching strategies and learning experiences.
- (2) Student and teacher involvement: Active participation of both students and teachers in the evaluation process can provide valuable perspectives and insights, leading to more relevant and effective educational strategies.
- (3) Data-driven decisions: Utilizing data collected from various assessments to make informed decisions about curriculum development, teaching methodologies, and resource allocation.

As shown in **Figure 1**<sup>[9]</sup>, the design of the blended learning model needs to consider various aspects such as the teaching model, objectives, teaching content and resources, teaching methods and strategies, and teaching evaluation. Only with a reasonable combination and effective integration of each aspect can the best teaching outcomes be achieved. The blended learning model breaks the spatial and temporal boundaries of teacher instruction and student learning, further stimulating students' initiative in learning. It promotes the implementation of “autonomous, cooperative, and exploratory” learning methods during the teaching process, which is conducive to improving the quality of talent cultivation and achieving the teaching effectiveness of “1 + 1 > 2.”



**Figure 1.** Blended learning model: Online and offline teaching process

## 5. Conclusion

The primary objective of this research is to develop a blended learning model that aligns with the educational framework of English majors at private applied universities. The study aims to significantly enhance students' proficiency in the essential language skills—listening, speaking, reading, writing, and translating—as well as to strengthen their cross-cultural communication competencies. Additionally, it seeks to foster their practical application skills and innovative thinking. The specific aims of the study are outlined as follows:

- (1) To identify a blended learning model that is well-suited to the pedagogical context of English majors at private applied universities.
- (2) To design and develop an online learning platform and a comprehensive set of teaching resources that correspond with the blended learning model. These resources will address key areas, including English listening, speaking, reading, writing, vocabulary enhancement, and cultural knowledge.
- (3) To organize professional development opportunities, such as training sessions and seminars, to elevate teachers' understanding and application of the blended learning model. This support will empower teachers to effectively and flexibly integrate the model into their teaching practices, with the goal of improving teaching efficacy and student satisfaction.
- (4) To iteratively refine the blended learning model through the implementation of experimental courses and by gathering insightful feedback from teaching experiences. This continuous optimization process is designed to progressively improve students' overall English proficiency and their cross-cultural communication capabilities.

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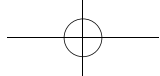


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