ESP in Vocational Institutes: A Mixed-Method Study of Students' ESP Learning Style Preferences

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Abstract

In vocational institutes, English for Specific Purposes (ESP) education should incorporate basic linguistic skills with professional communication abilities. There is a problem with ESP teaching that uses the traditional teaching model of general English, which fails to consider the needs of students. To tackle this problem, the aim of this study is to identify the preferred perceptual ESP learning styles of 254 students in seven Chinese vocational institutes. Data collection and analysis were conducted using a mixed-methods approach that combined both quantitative and qualitative methods. An adapted version of the Perceptual Learning Style Preference Questionnaire (PLSPQ) developed by Joy Reid (1987) was used at the first stage. Subsequently, in response to the questionnaire results, 15 students participated in semi-structured interviews. The results showed that a significant number of students chose minor learning modes rather than major learning modes. According to the data analysis, kinesthetic learning was the most preferred learning style, whereas group learning was the least preferred. The second to fifth places belonged to individual, tactile, visual, and auditory learning styles. The findings of the study have implications for ESP teachers, curriculum designers, and researchers considering students' preferred learning styles, changes in the learning environment, and materials adaptations.

Keywords: ESP learning style, mixed-methods study, students, vocational institutes

1. Introduction

Vocational education is a vital component for helping, benefiting, and enhancing the lives of the people and is a reliable guarantee of improvements in the quality of development and comprehensive competitiveness of the country (Miller, 2020). It has become evident in recent years that vocational education is playing an increasingly important role in the new wave of scientific and technological revolutions, industrial reform, and the development of the Chinese economy. A vocational institute provides post-secondary education that focuses on providing technical skills needed to perform a particular occupation. Students who are typically bound for a skilled trade are typically trained in such a program which differs from four-year universities in that it focuses on job-specific training. Nowadays, vocational institutes in China are increasingly emphasizing the importance of ESP. ESP courses must be taught in colleges, coupled with specialized knowledge to ensure that school English education and its practice are continuous, in accordance with the Ministry of Education's Basic Requirements for English Teaching in Higher Vocational Education (Ministry of Education, 2019). ESP is the continuation of English for General Purposes (EGP) and combines English language skills and professional knowledge. In this regard, ESP is the most notable feature of vocational English education. There are a number of practical and applied ESP courses developed by Chinese vocational institutes in order to meet the professional needs of students, such as Mechanical English, Computer English, Nursing English and so on. While ESP theory has been developed over a long period of time, ESP practices remain rudimentary and exploratory (Jafari Pazoki & Alemi, 2020). In spite of attending ESP classes, students are faced with embarrassing situations in which they are unable to use English effectively during real-life work situations. Student and teacher priorities in their learning place a greater emphasis on knowledge than practical application, and the intended goal of ESP, which is to train students in profession-related English skills, is not clearly stated. Vocational education and career development of students have been separated for quite some time. There was a general consensus among students that the ESP curriculum needed to be revised. In designing the ESP curriculum outline, teachers should fully consider the needs of their students and incorporate the learning style preferences and English comprehension abilities of each individual student. ESP courses are recommended to stimulate learners' initiative and facilitate their learning, as well as shift pedagogy from a teacher-centered to a student-centered paradigm.

In the absence of an understanding of learning styles, teaching and learning will likely be adversely affected. This will negatively impact academic success (Asrifan et al., 2020). There is a problem with most ESP teachers conducting teacher-centered learning sessions, which

results in a reduced amount of student participation in the learning process. When evaluating a student's performance, it is important to take into consideration their learning style (Ariastuti & Wahyudin, 2022). Educators are expected to facilitate a student's identification of their individual learning style by presenting challenges or utilizing a variety of instructional strategies (Costa et al., 2020).

There is an imperative need to identify and understand the differences between university and vocational teaching in order to accommodate ESP students' learning conditions and skills (Hyland, 2022). Both in real-life scenarios and in virtual classrooms, it is important to adapt instruction methods to the learning styles and interests of students. In vocational institutes, relatively little research is conducted. ESP research in China is primarily conducted at universities. Based on Reid's PLSPQ, Wang et al (2021) reports that ESP students have identified their preferred learning style at university level. To stratify the sample, they selected 865 undergraduate students from 10 different schools with ESP programs. Kinesthetic and auditory learning styles were selected by Chinese university students enrolled in ESP courses, in accordance with Reid's (1987) research. The aim of Yang & Wyatt (2021) is to facilitate the development of ESP teaching methods in Chinese universities by analyzing the needs of engineering undergraduates for ESP courses and discussing how ESP teaching materials can be developed. In their opinion, students with different career goals place a different priority on professional English skills. When designing activities for students, ESP practitioners should consider their individual needs. Despite these studies based on university students' ESP learning preferences, Chinese researchers have conducted very limited research into how ESP is taught at vocational levels.

Due to the lack of descriptive research on ESP learning styles in Chinese vocational institutes and the problems mentioned, this study will address the following questions:

1) What are the ESP learning style preferences of students at Chinese vocational institutes?

2) What are students' perceptions of their ESP learning style preferences at Chinese vocational institutes?

2. Literature Review

2.1 Concepts and Models of Learning Styles

The term "learning style" refers to "the general method (for example, global or analytic, auditory or visual) used by students in the process of learning a new language or any other subject" (Reid, 1987, p.90). Learning styles do not exist as a dichotomy; rather, they exist as a continuum or multiple, intersecting continuums. Perceptual learning style is used in this study to describe how learners utilize their senses to understand, store, and recall experiences (Reid, 1987). Kolb (2000) notes that learning styles are not fixed qualities, but rather a differential preference for learning that changes slightly from one situation to another. Learning, according to him, is a continuous process of experience and transformation resulting in knowledge. A person's learning is also influenced by interactions with his or her learning context. According to El-Sabagh (2021), each learning style has its own strengths and weaknesses, and just as they may be relevant in one context, they may not be relevant in another. A further finding was that learning styles can be modified by the context in which they are observed (El-Sabagh, 2021, p. 53).

It was Reid (1987) who first presented an overview of various learning-style measures at the university level by considering the perceptions of the learners' learning styles. The Reid study has been widely used by non-native English speakers to assess their learning style preferences in English. Therefore, the inventories referred to as "Perceptual Learning Style Preference Questionnaire (PLSPQ)" were used as the individuals participating in the study were English learners enrolled in undergraduate programs. A five-point Likert scale was used in order to rate each of the 30 items of the questionnaire based on the response of the participants. Reid (1987) suggests that there are six types of perceptual learning styles for ESL/EFL learners:

Table 1. Reid's six types of ESL perceptual learning styles

Visual	It is easier to learn words from books, chalkboards, and workbooks when they are visible.
Auditory	Hearing words spoken and hearing explanations orally enhances learning.
Kinesthetic	Physical involvement in classroom experiences is the most effective way to learn.
Tactile	Having the opportunity to work with materials hands-on is the best way to learn.
Group	Studying with at least one other student leads to greater learning success and will lead to better work completion.
Individual	It is easier to learn when one is working alone; one can think more clearly and remember more information.

2.2 Previous Research on ESP Learning Styles

Chinese vocational institutes have been undergoing an ongoing reform of English language education in response to public expectations that vocational graduates be able to use English effectively for international communication as well as in a variety of disciplinary fields (Wen & Zhang, 2020). As the key to meeting these expectations ESP learning has been regarded as a key path (Hyland & Jiang, 2021), which has led to further expectations that ESP students should become increasingly involved in learning a variety of ESP courses, even when their English proficiency is greater than what is normally expected of ESL students. When confronted with these expectations, students find themselves "caught in the middle" (Iswati & Triastuti, 2021, p. 285). In light of the tight schedules of ESP courses in Chinese vocational institutes, little research has been conducted to propose solutions to this problem. Due to the fact that student population in China has remained relatively unchanged in terms of their perceptions of the effectiveness of learning, it may be possible to gain insight into the general learning culture at Chinese vocational institutes from this study.

In their study of Chinese learners, Xu, Chan & Yilin (2020) found that group learning is less preferred by Chinese ESP learners. It has been suggested that Ho's (2020) explanation is mainly due to the fact that the learning style dimensions of cooperation are a natural consequence of the Confucian philosophical system and Chinese value system of collectivism. From the primary schools, students are usually closely integrated into small groups, whose membership remains the same throughout the child's education. ESP students from the cooperative Chinese culture, however, are unwilling to work together in small groups in ESP classrooms, primarily because of the ad hoc nature of small-group work, where the groups form, and reform as needed for the task at hand. As a result, they are accustomed to the permanence of long-term groups, as well as defining their identity over the course of a long period. In their study, Li, Zhang & Parr (2020) noted that cooperation frequently takes place outside of the classroom, such as in the context of study groups or in other after-school activities. Similar to Hu & Wu (2020) report that Chinese students rarely work in groups in class, preferring to study in groups outside the ESP classrooms.

Another important finding from the research is that Chinese learners find role-playing to be one of the most challenging and least relaxing tasks that they have to do as it involves both individual work and they have to "stand out from their class.". Based on Cabual's (2021) research, Chinese university students tend to favor group and auditory modes of learning, and the less popular modes of learning are individual and kinesthetic. His research does not provide an explanation of the students' language learning styles. A study by Hu et al (2021) indicates that students in the Language and Humanities majors are more likely to prefer kinesthetic learning over students in the Science/Medicine and Business majors in ESP classrooms. Tertiary education, according to Gong, Gao & Lyu (2020), has a significant impact on learners' learning styles. According to Lethaby & Mayne (2020), students who studied English for a longer period of time preferred kinesthetic learning. A kinesthetic learner is more likely to take risks, which is an essential element of language acquisition success. In addition, her research shows that students are more likely to prefer kinesthetic learning if they have been attending classes taught by native English speakers.

3. Methodology

3.1 Participants

3.1.1 Quantitative Research

Stratified sampling and clustering were used in the study for quantitative research. Cluster sampling was used to seven higher vocational institutes across the country. The seven vocational institutes selected represent each of the Chinese representative regions. Beijing Vocational Institute from the northern region, Nan Jing Polytechnic Institute from the eastern region, Chang Chun Polytechnic Institute from the Northeast region, Shen Zhen Polytechnic Institute from the Southern region, Wu Xi Vocational Institute from the central region, Chong Qing Polytechnic Institute from the Southwest region, and Shaan Xi Polytechnic Institute from the Northwest region. The Ministry of Education has certified the ESP courses offered by these vocational institutes. A variety of practical and applied disciplines are taught in these vocational institutes, such as Mechanical Design, Financial Management, Computer Science, Tourism Administration, Media Arts, Nursing, etc. There is a requirement for English instruction related to each of the majors listed above. For this reason, the institutes provide ESP courses, such as mechanical English, business English, computer English, nursing English.

Geographic clusters are often the focus of research. It is flexible and efficient, and it reduces both costs and the amount of time devoted to the process (Henderson & Sundaresan, 1982). This is followed by stratified sampling. A stratified sampling method is employed when an objective result requires dividing a population according to certain characteristics, as described by Pandey & Pandey (2021). Simple random sampling will result in fewer participants if the number of participants is unbalanced according to gender. Figure 2 summarizes the sampling process used in this study.

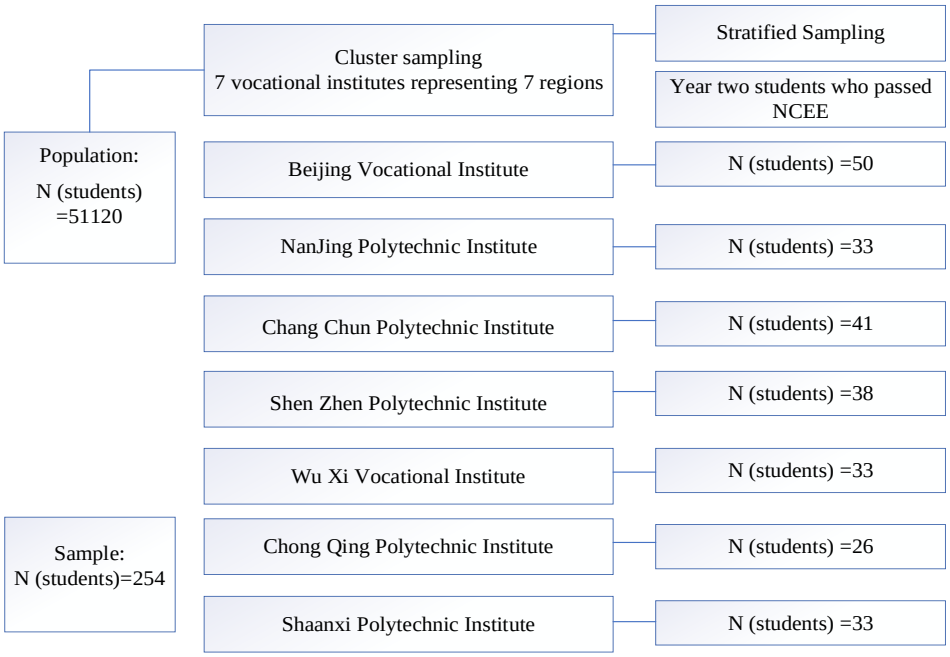

Figure 2. Sampling process for quantitative research

In order to understand students' individual English needs, this survey utilized a valid stratified sampling of 254 learners from seven vocational institutes. Since ESP courses are generally offered in the first semester of a student's sophomore year at Chinese vocational schools, only students in their second year of studies were selected. Students from a variety of disciplines participated in the study, including 85 from Mechanical Design (33%), 73 from Financial Management (29%), 55 from Computer Science (22%), 26 from Tourism Administration (10%), 10 from creative media (4%), and 5 from Nursing (2%). Prior to enrolling in vocational institutions, all participants had passed the NCEE (National College Entrance Examination). Among the 254 students participating in this study, 132 were males (52%), and 122 were females (48%). Most of the participants are Chinese (n=240; 94%), although some come from other countries. The participants illustrate that Chinese vocational institutes attract students from a wide range of international backgrounds. The participating students were from Russia (n=11; 4%) and Japan (n=3; 1%).

3.1.2 Qualitative Research

Qualitative research in this study was conducted using a homogeneous sampling method. The characteristics of the selected participants have similarity or specificity in this regard. In this study, all the participants are enrolled in ESP courses at Chinese vocational institutes. A sub-sample of 15 ESP students participated in semi-structured interviews. As Boddy (2016) suggests, a minimum number of samples for an interview should be 12 participants.

3.2 Data Collection

3.2.1 Questionnaire

For both native and non-native speakers of English, a number of instruments have been developed to identify learning styles. Kolb (1976, 1984), Dunn, Dunn, & Price (1979), and Riechmann & Grasha (1974) constructed popular learning-style scales for native English speakers. For speakers of languages other than English, Oxford (1996) developed the Style Analysis Survey. O'Brien (1990) developed the Learning Channel Preference Checklist, and Reid (1984) developed the Perceptual Learning Style Preference Questionnaire (PLSPQ).

As for this study, Reid's (PLSPQ) questionnaire was selected since in comparison with other similar instruments, PLSPQ has the advantage of having been developed specifically for and normed on an adult ESL student population that included Chinese students (Reid, 1987). It also has a satisfactory degree of internal consistency (Reid, 1987). Cronbach's alpha was .70 in Pelegrín's (2020) study. In PLSPQ, respondents are instructed to indicate their preferences towards the six categories of visual, auditory, kinesthetic, tactile, group, and individual preferences. It consists of 30 items, with five items assessing each of the six dimensions of Visual, Auditory, Kinesthetic, Tactile, Group and Individual preferences on a Likert scale of "Strongly Agree" to "Strongly Disagree." Based on the total scores of the five items that measure each preference, the style preferences are categorized as Major, Minor, and Negative.

There were some slight modifications to the PLSPQ. Several items were rephrased and deleted from the questionnaire in order to improve its reliability, validity, and relevance to the research questions. A scale of 1 (Strongly Disagree) to 6 (Strongly Agree) is used in the adapted questionnaire. This method prevents students from selecting a non-committal or middle response, allowing them to express their opinions and feelings clearly. In addition, some of the statements have been revised by providing more specific examples relating to ESP

courses. Some statements were clarified with examples in this study in order to facilitate understanding by the participants. The statement, "In class, I prefer to learn through practical exercises." was not clear to some students, so the researcher provided an example of "Simulated check-in for a foreign guest during Tourism English course." next to the statement so that there would be no misunderstanding. Consequently, the new item is formatted as "In class, I prefer to learn through practical exercises (E.g., Simulated check-in for a foreign guest during Tourism English course)". Thirdly, too many repetitions exist in the PLSPQ, causing boredom and reducing motivation for respondents to complete the survey. The PLSPQ in this study was simplified by eliminating some repeating statements and reducing the number of statements in each category from five to four to simplify the questionnaire.

A web link was used to disseminate the questionnaire to the students via a cloud-based internet platform. Using a mobile phone or a computer online, students were able to access the questionnaire conveniently. Answers to the questionnaire were collected through their online devices and stored in the cloud. A guarantee of anonymity was provided to all participants, and all data was intended solely for research purposes. There was no impact on their grades as their participation was entirely voluntary.

3.2.2 Semi-structured Interview

During semi-structured interviews, open-ended questions were asked in order to facilitate flexible two-way communication and ensure focus on a particular topic. A semi-structured interview was conducted in order to better understand students' preferences for English language learning styles in ESP contexts. Students' learning styles may not be accurately reflected by certain questionnaires. To avoid linguistic limitations, interview participants were asked to speak in the language in which they felt most comfortable. Interviews were recorded on tape and transcribed if a review is necessary. The purpose of the interview will be briefly explained before the interview. During the interview, students were asked a number of questions regarding their learning style preferences in ESP classrooms, as well as their perceptions of ESP education at Chinese vocational institutes.

3.3 Data Analysis

3.3.1 Quantitative Data

An analysis of the results was conducted using descriptive statistics. The collected data was coded, and SPSS was used to calculate the means and SDs for all 24 items. To determine the means and SDs according to the learning style subscale, 24 items were grouped into six categories based on their perceptual learning style classification (as in the PLSPQ). In order to interpret the results, the numerical values of each ESP learning style are added up to indicate the major (20-24), minor (12-19), and negative (0-11) learning style preferences.

3.3.2 Qualitative Data

An analysis of ESP learning styles was conducted using grounded theory. The use of this method allows researchers to analyze complex human experiences in a rational and flexible manner (Charmaz, 2015). The data had to be reorganized and integrated through categorization. A qualitative data analysis was conducted by using the software NVivo, which enabled the creation of codes, data coding, the generation of reports, and the operation of queries. A conclusion was reached based on existing research regarding learning styles.

4. Results

4.1 Quantitative Results

For the purpose of analyzing students' preferred ESP learning styles, descriptive means and standard deviations of the SIX types of learning styles were calculated. It was the learning style with the highest mean value that was most widely preferred by students. Table 3 presents the means of the ESP learning styles preferences.

Table 3. Students' ESP learning style preferences

ESP learning style	N (student)	Mean	Std. Deviation
Visual	254	4.38	.66
Auditory	254	4.26	.72
Kinesthetic	254	4.83	.84
Tactile	254	4.65	.76
Individual	254	4.55	.58
Group	254	3.93	.69

The kinesthetic learning style of the PLSPQ has the highest mean score of 4.83 (SD=.84). Conversely, the lowest mean value recorded for group learning style is 3.93 (SD=.69). Among the following learning styles, individual (M=4.55, SD=.58), tactile (M=4.65, SD=.76), visual (M=4.38, SD=.66), and auditory (M=4.26, SD=.72) rank second to fifth. As mentioned in section 3.3, the preference mean scores were divided into three categories: major (20-24), minor (12-19) and negative (11 or less). Minor preferences are those styles of learning that learners can use to meet the task requirements, while major preferences are those styles of learning that students find natural and acceptable. Negative preferences are defined as any learning approach that students struggle with and, therefore, will not choose on their own (Vermote et al., 2020). Students' major, minor, and negative learning styles are shown in Figure 4. Minor learning styles were prevalent among many students.

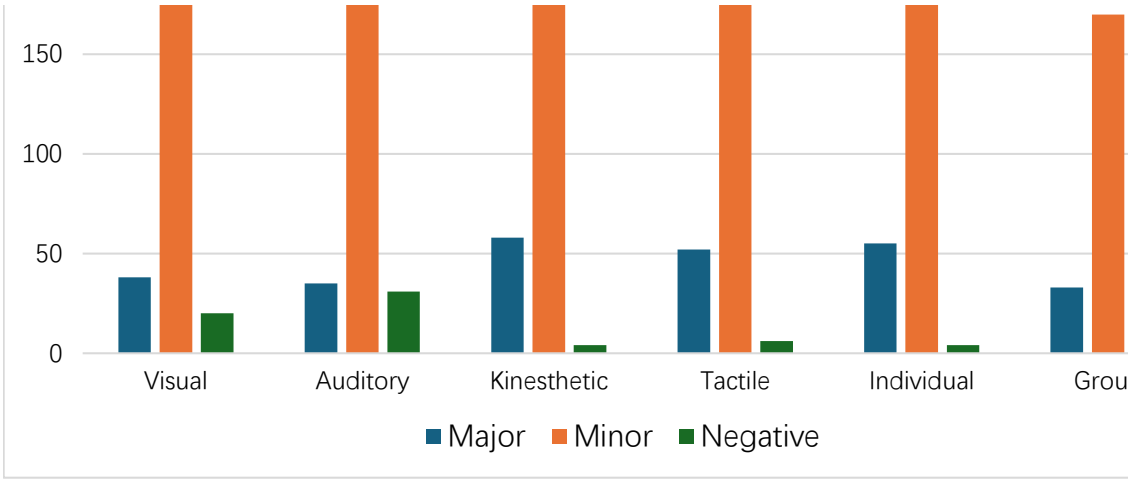

Figure 4. ESP learning style preferences: Major, Minor and Negative

4.2 Qualitative Results

Following completion of the questionnaire, 15 students from seven vocational institutes agreed to participate in a group interview lasting 30 minutes (5 students in each group). In addition to coming from a variety of disciplines, these students also attended a variety of senior high schools in English-speaking countries as well as Chinese senior high schools and international high schools in China. In addition, they scored between 60 and 100 in the NCEE (National College Entrance Examination), a test that reflects their English proficiency. An overview of the students' perceptions of their ESP learning style preferences is presented in Figure 5.

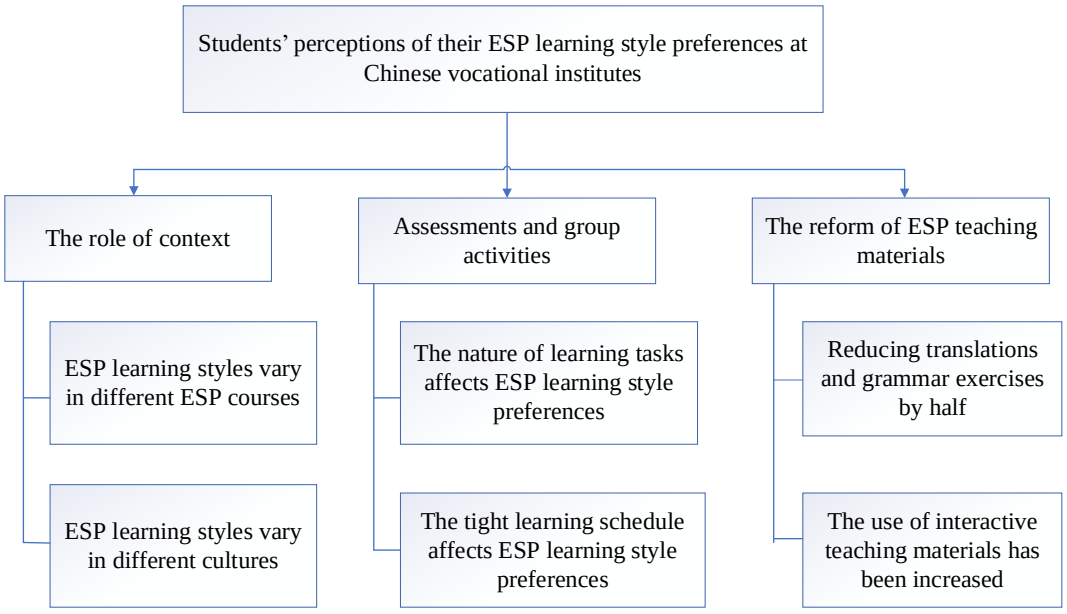

Figure 5. A summary concerning the students' perceptions of their ESP learning style preferences

In the process of collating and categorizing key statements, this study highlighted, categorized, and collected general themes and subthemes. The following themes emerged in Table 6, the changing learning context in vocational institutes, the influence of ESP courses on learning style preferences, the tight schedules and the assessment of group activities related to ESP in vocational institutes, and the transformation of ESP teaching materials in vocational institutes.

Table 6. Major themes and subthemes identified in students' key statements

Themes	Subthemes	Representative quotes by students
The role of context	Different ESP courses	*"I prefer visual learning during my Mechanical English course. There are some terms I need to memorize and analyze. In order to find a job, I have also completed a minor in Business English. It is true that we have lots of management real-life case studies in Business lessons. So now I prefer kinesthetic learning."*
	Different cultures	*"As part of the questionnaire, I was asked whether I enjoyed working with others or whether I learned more or better while working with others. Whenever possible, I would accommodate the teacher's requirements. Teachers are the examiners at Chinese vocational institutes. I must meet their requirements to attain a high GPA."*
Preferences for group learning style	Assessment of learning tasks	*"In my ESP class, I enjoy participating in role-play activities, but the group work should not be associated with assessments."*
	Tight learning schedule	*"I am not a fan of group projects. Everyone has other assessments and part-time jobs, and we all have diverse learning schedules. Finding suitable time to study with others can be difficult."*
The reform of ESP teaching materials	Half the grammar and translation exercises	*"In the past, our ESP textbook emphasized reading and grammar. I was really upset. In contrast, the textbook now provides us with examples of dialogue and different situations and characters."*
	More interactive teaching materials available	*"The textbook contains several units designed to introduce popular professional software, famous virtual labs, and retrieval techniques, as well as an ESP e-textbook developed in Adobe InDesign. I'm quite a tactile learner now."*

4.2.1 The Role of Context

ESP students raised the issue of learning context as one of their major concerns. According to the students, the choice of ESP learning style would depend on the context. The responses of students varied according to the different contexts of ESP learning in several cases. This implies that learners cannot be classified as having discrete learning styles; rather, they employ a number of different learning methods to facilitate learning and maximize learning opportunities.

Some international students reported that they would select different answers based upon whether the statements were referring to classes in their home country or ESP courses at Chinese vocational institutes. As discussed by the students from Russia and Japan, there are generally large classrooms in China where ESP classes are taught, and there is a requirement that students pass standardized tests in order to get good grades. It is more important for students to pass these tests, which are largely based on memorized knowledge, than to learn in the manner they prefer.

4.2.2 Assessments and Group Activities

Nearly all students with higher academic abilities said that they preferred to do their assignments independently because they were unable to trust other students' abilities and concerned that other students' input may affect their academic performance. There have been complaints from students who have higher ability levels that group assignments are unfair to students with higher ability levels, as they feel they must always complete work for students with lower ability levels. As a result, students of lower ability were more likely to desire group assessments since they believed that the higher ability students could assist them in completing their tasks successfully and improving their academic performance. On the basis of the interview findings, it can be concluded that the nature of the learning tasks may play a significant role in the preference students may have for group learning style. In general, students with the high English proficiency prefer group learning for learning activities that do not require any type of assessment.

Many students indicated that their preference for group learning might also be influenced by the tight learning schedule. There are about 15 to 20 credit hours of study that Chinese students are required to take in each semester in vocational institutes, and most of the ESP courses consist of both continuous assessments (e.g. essays, presentations, and projects) and final examinations. In addition to their studies, some students may be working part-time jobs after school. There may be difficulties with time management for many vocational students, particularly at the end of the semester when assignments must be submitted. As a result, they prefer individual learning over group learning, as they feel that they can handle their work and manage their time better.

4.2.3 The Reform of ESP Teaching Materials

Students have reported that the reform of the ESP teaching materials has changed their learning style from a primarily visual to one that is more tactile and kinesthetic. It has been expressed by most ESP students that their most important objective is to improve their communication skills in a professional English-speaking environment. As the result of an analysis of students' needs, the Education Ministry of China revised a guidance document in 2019, indicating a new orientation for English teaching in vocational institutes, which is designed to facilitate the development of students' professional skills. In order to cater to limited teaching hours, contextual factors, and student needs, ESP teachers in China modified their teaching materials. It has been decided to reduce the number of hours that are spent on translations and grammar exercises by half. In order to activate students' willingness to participate in class, more interactive teaching technologies have been utilized, including using online news websites, technology blogs, project descriptions, product descriptions, manuals, technical specifications, advertisements, posters, work mails, and reports as teaching materials.

5. Discussion

Most of the learning style research (Hu et al., 2021; Nge & Eamoraphan, 2020; Sengsouliya et al., 2021; Lethaby & Mayne, 2020) demonstrates that Chinese ESL students had major preferences for some learning styles, such as group and tactile learning. In this study, however, a significant number of students chose minor learning modes rather than major learning modes. As Reid (1987) notes, some participants, such as Japanese students in her study, might find it more comfortable to respond moderately to surveys than to select either "strongly agree" or "strongly disagree". Students in this study seemed to favor the "moderate" options. There were few students with negative learning modes, and there was no preference for negative learning styles in general as in some studies concerning Chinese learners (Feng, Iriarte & Valencia, 2020; Hu et al., 2021).

The results of several learning style studies (Lethaby & Mayne, 2020; Sun & Zhang, 2020; Li, Zhang & Parr, 2020) indicate that Chinese ESL students are more inclined to prefer visual learning than other learning styles, and thus these researchers may refer to Chinese students as visual learners. It should be noted, however, that these studies investigated Chinese ESL students in universities studying general English rather than ESP students at vocational institutes. The results indicate that when compared to other learning styles, ESP students did not have a high preference for visual aids such as PowerPoint presentations, handouts, and notes on the board. As there are very few research studies that compare students studying general English with those studying English as a second language, there is no previous literature that can explain the above finding. Most studies assume ESP is part of General English in universities and that students at vocational schools may have similar learning styles.

One explanation for the differences may be that ESP courses at vocational schools are primarily taught in terms of professional terminology, oral communication, and practical translation (Asrifan et al., 2020). An oral communication skill is a necessary component of a successful career. Consequently, the ESP situation, communication, and field will be transformed into a reality, a communication situation, and a professional context within the classroom. As more and more Chinese enterprises go abroad and participate in international competitions and projects, oral communication has played a vital role in both domestic and foreign technical exchanges, including the negotiation of projects, bidding, contract signing and project operation. Students might, therefore, shift their original preferences for visual learning.

6. Limitations

Due to time and human resource constraints, this study was unable to conduct a comprehensive survey of all vocational institutes in China, and therefore selected research participants from only the seven largest vocational institutes in China. Due to the fact that students differ in terms of gender, age, cultural background, and educational level, a generalization cannot be made for all students. It would be more reliable and valid to conduct more studies with a larger sample and a range of variables. Students interviewed indicated that their ESP teachers' teaching styles greatly influenced their preferred learning styles. It will be necessary to conduct further research to examine the teaching style preferences of ESP teachers at Chinese vocational institutes as well as the extent of match or mismatch between learning style preferences and teaching style preferences in ESP classrooms at Chinese vocational institutes.

7. Conclusion

This study used a mixed-methods approach, which combines both quantitative and qualitative methods to investigate the learning styles of ESP students at Chinese vocational institutes. Their results indicated that Kinesthetic learning styles were favored most, while group learning styles were least favored. There were five types of learning styles ranked from second to fifth, including individual, tactile, visual, and auditory. The findings of this study highlight the importance of identifying students' learning styles preferences, which has implications for delivering a variety of educational activities to students. It is important that ESP teachers approach their teaching in a balanced manner in order to accommodate students who have diverse learning styles. For example, as part of the Tourism English course, there are some activities which are best understood by doing, i.e., Simulated check-in of foreign tourists, reservations for foreign tourists, airport receptions for foreign tourists, and writing an English itinerary in the real environment would be more beneficial to students than simply lecturing in the classroom. A multisensory approach to academic success should be incorporated into the learning process for incorporating more interactive learning experiences. Additionally, this study sheds light on the development of ESP curriculum and the training of ESP teachers. It is crucial to be aware of the learning styles of students in order to be able to aid curriculum designers and ESP teachers in designing curricula and adapting methodologies, particularly in ESP, to meet the needs of the students. ESP teachers should concentrate more on the practical aspects of the curriculum in addition to the theoretical aspects.

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Not applicable

Authors' contributions

Liuchi Yao was responsible for the data collection, drafting, and writing up of the manuscript. Associate Professor Dr. Norwati Roslim and Dr Nadhratunnaim Abas took charge of the study instruments and design. Liuchi Yao, Dr Nadhratunnaim Abas and Associate Professor Dr. Norwati Roslim were also tasked with analyzing the data and performing further revisions. All authors read and approved the final manuscript. All authors contributed equally to the study.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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