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Effects of Technology-Based Practice on Chinese University Students' Interpreting Emotions and Performance

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Abstract: As a critical component of second/foreign language learning, interpreting is both rewarding and highly anxiety-provoking. Yet, the review of the literature shows that studies on interpreting anxiety and other emotions are limited, and intervention studies on reducing interpreting anxiety and increasing confidence in interpreting are hardly available. This study employed a quasi-experimental design and explored the effects of technology-based practice on Chinese undergraduate English majors' interpreting emotions and performance over a 12-week period. There were 44 students in the experimental group with technology-based practice and 46 were in the control group without technology-based practice from a university in Beijing. They took an interpreting test and answered an eight-item interpreting classroom anxiety scale, a nine-item interpreting classroom enjoyment scale, and a three-item interpreting self-efficacy scale prior to (phase 1) and after (phase 2) the intervention. The major findings were: (1) students in both groups became significantly less anxious and more joyful in the interpreting class, had significantly greater interpreting self-efficacy, and performed significantly better in the interpreting test in phase 2, (2) both groups started at a similar level in phase 1, and the experimental group reported a significantly lower interpreting classroom anxiety level, significantly greater interpreting self-efficacy, and higher interpreting test scores than the control group in phase 2, and (3) the learning modes significantly affected the participants' interpreting classroom anxiety, self-efficacy, and performance. These findings indicate the effects of the intervention and hence enrich the current literature on interpreting emotions. The findings also highlight the importance of technology-based practice in enhancing students' confidence, self-efficacy, and performance in interpreting, leading to sustainable development in interpreting competence.

Keywords: technology-based practice; classroom emotion; interpreting performance; sustainable development

Citation: Liu, M. Effects of Technology-Based Practice on Chinese University Students' Interpreting Emotions and Performance. *Sustainability* **2024**, *16*, 5395. https://doi.org/10.3390/su16135395

Academic Editor: Bojan Obrenovic

Received: 23 May 2024
Revised: 14 June 2024
Accepted: 18 June 2024
Published: 25 June 2024

1. Introduction

The role of learner emotions in second language acquisition has long been observed: negative emotions like anxiety largely impede learning while positive emotions like enjoyment are conducive to second/foreign language (SL/FL) learning in diverse contexts [1–4]. Understandably, SL/FL learning is both challenging and rewarding.

Of the four basic skills (i.e., reading, writing, speaking, and listening) of SL/FL learning, speaking an SL/FL is often believed to be the most anxiety-provoking in that it requires instantaneous planning, conceptualization, organization, and articulation in the SL/FL unfamiliar to the speaker [3,5]. Thus, speaking anxiety has been most researched in various SL/FL contexts, including foreign language classrooms (e.g., [3,5–10]). Studies show that learners feel anxious when learning/speaking the SL/FL due to various reasons (e.g., low proficiency, lack of practice, fear of being laughed at, low self-confidence, fear of being negatively evaluated, etc.) and that this anxiety debilitates their SL/FL learning. Hence, strategies are needed to help reduce anxiety and improve students' learning of the SL/FL and studies on the effects of such strategies are called for.

Understandably, interpreting is even more anxiety-provoking, as it involves not only speaking the SL/FL but listening to, analyzing, comprehending, translating, editing, and reproducing information/ideas from the source language to the target language [11]. Although often not so highly valued as the four basic skills (i.e., speaking, reading, writing, and listening) of a language, interpreting is also an important part of SL/FL learning in that it makes effective communication possible between people speaking different languages. Emotions related to interpreting are hence worth researching. Surprisingly, not much research on interpreting anxiety can be found in the current literature [12]; intervention studies on interpreting anxiety and performance are hardly available.

Meanwhile, foreign language enjoyment has been increasingly researched in recent decades and shown to positively relate to SL/FL learning and self-efficacy but negatively to foreign language anxiety (e.g., [6,7,13]). Yet, little research on how to enhance students' enjoyment in foreign language classrooms can be found in the current literature. Similar to anxiety, little research on enjoyment in students of interpreting can be found [12], let alone research on the effects of interventions on interpreting enjoyment and performance.

Additionally, as reviewed below, foreign language anxiety and enjoyment are closely related to each other and collaboratively predict students' foreign language achievement. Hence, this study intended to explore the effects of technology-based practice on Chinese university English majors' interpreting emotions and performance over a 12-week period, hoping to enrich the current literature on learner emotions and SL/FL achievement and provide insights for the teaching and learning of interpreting as well as SLs/FLs. The study focused on technology-based practice because technology was involved in the whole process of practicing interpreting. Moreover, technology-based practice enabled learners to have a record of their practice, reflect on their performance, and improve their interpreting, thereafter leading to sustainable development in their interpreting competence. The strategy itself is sustainable as well and can be used in different areas of language education.

To achieve this goal, this research aimed to answer the following two research questions:

(1) How do the students' interpreting classroom anxiety, enjoyment, self-efficacy, and performance change prior to and after the technology-based practice during the 12-week period?
(2) How does technology-based practice affect the students' interpreting classroom anxiety, enjoyment, self-efficacy, and performance?

2. Literature Review

Of the various learner emotions in SL/FL learning, the most frequently researched are foreign language anxiety, enjoyment, and then boredom. Because interpreting generally requires high attention, this study focused on anxiety and enjoyment in an interpreting class and the effects of technology-based practice on them, which thus shaped the literature review presented below.

2.1. Interpreting Classroom Anxiety

Mainly because of the complexity of SL/FL learning, "any performance in the L2 is likely to challenge an individual's self-concept as a competent communicator and lead to reticence, self-consciousness, fear, or even panic" [3] (p. 128). Defined as "the feeling of tension and apprehension specifically associated with second language contexts, including speaking, listening, and learning" [14] (p. 284), foreign language anxiety (FLA) is situation-specific and unique [3,15].

Foreign language classroom anxiety (FLCA), a situation-specific type of FLA, refers to "a distinct complex of self-perceptions, beliefs, feelings, and behaviors related to classroom language learning arising from the uniqueness of the language learning process" [3] (p. 128). It covers three dimensions: communication apprehension, test anxiety, and fear of negative evaluation. Communication apprehension is defined as "a type of shyness characterized by fear of or anxiety about communicating with people" [3] (p. 127), test anxiety is "a type of performance anxiety stemming from a fear of failure" [3] (p. 127), and the fear

of negative evaluation concerns "apprehension about others' evaluations, avoidance of evaluative situations, and the expectation that others would evaluate oneself negatively" [3] (p. 128). As discussed in Horwitz et al. [3] and Gregersen and Horwitz [16], learners who feel anxious when speaking in groups tend to become (more) anxious when speaking in a foreign language class; test-anxious students often worry more about their performance; learners who are fearful of negative evaluation hardly initiate conversation and are less willing to interact with others in the target language.

To identify anxious students in foreign language classrooms, Horwitz et al. [3] designed a 33-item foreign language classroom anxiety scale (FLCAS), which covers the three dimensions of FLCA with an enormous focus on speaking anxiety. Additionally, Gardner [17] developed an eight-item French classroom anxiety scale. The FLCAS soon gained wide popularity and has been extensively employed/adapted in empirical research to measure general foreign language anxiety or specific types of foreign language anxiety, such as foreign language speaking anxiety and classroom anxiety (e.g., [5–10,18,19]). The scale was later shortened to eight items by Botes et al. [20]. Empirical studies show that many students experience anxiety in their foreign language classrooms due to various reasons, such as insufficient practice, low proficiency, lack of confidence, peer pressure, fear of being negatively evaluated, and fear of being the focus of attention (e.g., [3,8,21]). Meanwhile, an inverse correlation has been consistently revealed between FLA/FLCA and language performance (e.g., [3,6,7,9,10,19]) and self-efficacy (e.g., [12,22,23]). For example, Shih [24] found that self-efficacy significantly mediated the relationship between FLA and English achievement in 356 Taiwanese senior high school students. Dewaele et al. [25] employed sophisticated statistical analyses to examine the predictive effects of emotions on 502 Moroccan EFL learners' English performance. The results indicated that FLCA, foreign language enjoyment, and boredom all significantly affected the participants' English performance, with FLCA having the strongest (negative) effect. Hence, the researchers warned foreign language instructors and students not to underestimate the influence of anxiety on language learning.

Consequently, many strategies have been proposed to help reduce anxiety, such as increasing exposure to and practice of the SL/FL, providing students with more time to think, praising and encouraging, and enhancing students' self-confidence and motivation (e.g., [5,25,26]). Meanwhile, many experimental studies have been conducted to explore the effects of interventions on FLA/FLCA (e.g., [5,26–30]). For example, Bontempo et al. [31] claimed that increasing interpreters' self-efficacy might reduce anxiety. Xiangming et al. [26] discovered that using a mobile learning app significantly decreased Chinese postgraduate students' speaking anxiety but increased their speaking performance in English class. Liu [5] found that using TED talks greatly reduced Chinese postgraduate students' anxiety in their advanced oral English communication class. Li et al.'s [29] meta-analysis of 11 empirical studies demonstrated that mindfulness-based interventions helped alleviate FLCA in Chinese college students. Jin et al. [32] recruited 88 Chinese university students to examine the impact of reminiscing about language achievements on their English language classroom anxiety. The study showed that after a 30-day intervention, English language classroom anxiety remained stable in the control group but lowered significantly in the experimental group. The study also found that the experimental group reported progress in almost all aspects of English learning. The researchers thus claimed that reminiscing was more related to positive emotions.

As evidenced in these studies, interventions, especially those with the use of technology, help increase students' practice of the SL/FL and reflections on their learning, decrease their anxiety, increase their confidence and self-efficacy, and improve their proficiency in the SL/FL. Nevertheless, such studies are still not enough to capture the dynamic nature of FLA and FLCA and how they are shaped by the environment and other factors. For example, Tsang and Dewaele [33] found an FLCA level of 2.90 in young Hong Kong learners, while Jiang and Dewaele [34] found an FLCA level of 3.14 in Chinese university students.

Concurrently, research indicates that speaking publicly in an SL/FL is the most anxiety-provoking to most SL/FL learners (e.g., [3,15,21]). Interpreting involves not only speaking the SL/FL but also listening to, analyzing, comprehending, translating, editing, and reproducing information/ideas from one language to another [11]. Simultaneously, interpreting can be impacted by unexpected elements like non-standard pronunciation, difficult source texts, bad memory, and linguistic differences between the source and the target languages. For example, Wang and Liu [35] identified two major reasons for rigid translation from English to Chinese: the improper comprehension of English due to vocabulary, grammar, culture, and other knowledge connotated in the source text, and linguistic inexpressiveness due to cultural and linguistic differences between the two languages or the interpreter's low interpreting ability. All these can lead to even greater anxiety in the interpreter and then impede their performance in interpreting [11,36–38]. For example, Yan and Wang [39] found significant relationships between second-language writing anxiety, translation performance, and language ability. Xu and Liu [12] surveyed 67 Chinese university majors for interpreting and found that the participants generally experienced anxiety in the interpreting class and reported a (fairly) high level of interpreting classroom enjoyment and interpreting-learning self-efficacy. The participants attributed their anxiety to reasons including low English proficiency, fear of making mistakes, lack of confidence, lack of practice, and inability to find proper expressions or linguistic inexpressiveness. The study also revealed significant correlations between interpreting classroom enjoyment, anxiety, and self-efficacy and significant effects of interpreting classroom anxiety and enjoyment on the respondents' self-rated English–Chinese interpreting competence.

Nevertheless, not many studies on interpreting anxiety can be found, let alone intervention studies on interpreting classroom anxiety. This motivates the present research to investigate the impact of an intervention on interpreting classroom anxiety.

2.2. Interpreting Classroom Enjoyment

Proposed by Dewaele and MacIntyre [40], foreign language enjoyment (FLE) refers to "a complex emotion, capturing interacting dimensions of challenge and perceived ability that reflect the human drive for success in the face of difficult tasks" [41] (pp. 216–217). As implied in this definition, foreign language learning is challenging and yet rewarding. Hence, foreign language enjoyment and anxiety co-exist in learners in a foreign language classroom [41]. It is thus important to examine FLE to understand its role in SL/FL learning and the causes of FLE in various contexts.

Taking learners' psychological needs into account, Dewaele and MacIntyre [40] designed a 21-item foreign language enjoyment scale (FLES) to research enjoyment in foreign language classrooms. This scale was later shortened to nine items and covered three dimensions by Botes et al. [42]: teacher appreciation (students' perceptions of how their psychological needs were met by their foreign language teacher), personal enjoyment, and social enjoyment (the satisfaction of social psychological needs).

Increasing research has been conducted on FLE in recent decades via different versions of the FLES, interviews, journals, and other instruments (e.g., [7,40,42–47]). The findings reveal a negative relation between FLE and FLCA [6,12,40,41,43,48] and a positive relationship between FLE and SL/FL learning outcomes [44,47,48], motivation [7,49], and self-efficacy [12,50,51]. For example, Dewaele et al.'s [6] study of 168 Arab and Kurdish EFL (English as a FL) students revealed that the participants reported significantly greater FLE, higher FLCA, and lower foreign language boredom in real classes than in remote teaching classes. Shao et al. [19] explored correlations between achievement emotions, control-value appraisals, and foreign language performance in 550 Chinese university students. They found that perceived control and value were positively related to positive emotions (i.e., enjoyment, hope, and pride) and foreign language performance but negatively to negative emotions (i.e., anxiety, shame, boredom, anger, and hopelessness). The researchers also found that control and value collaboratively predicted the eight emotions and foreign language performance. Dewaele et al.'s [25] study of 332 foreign language

learners showed that FLE was closely related to FLCA and foreign language boredom and that FLE was positively affected by teacher behaviors. In Liu and Hong [47], both survey data and responses to open-ended questions on FLCA and FLE were collected from 709 Chinese primary and secondary school students, which revealed that FLE and FLCA were significantly related to each other. Another major finding was that both learner- and teacher-related variables contributed to FLE and FLCA and that FLE and FLCA led to varying behaviors and engagement in the class, respectively. Zeng's [52] review uncovered that FLE could lead to higher levels of motivation and engagement in language learners, which could result in prolonged success and achievement. The researcher thus considered it important to promote FLE in foreign language classrooms.

Surprisingly, few studies have been conducted on how to enhance students' enjoyment in foreign language classrooms. Moreover, despite increasing research on FLE in students with varying backgrounds, research on FLE in students' interpreting ability is hardly available in the current literature. Of such limited research, Xu and Liu [12] discovered that interpreting classroom enjoyment was significantly inversely correlated with anxiety and positively predicted the students' self-rated English–Chinese interpreting competence.

As such, research on interpreting anxiety is far from adequate, research on interpreting enjoyment is more limited, and intervention studies on interpreting classroom anxiety and enjoyment are hardly available. All these, coupled with the finding that foreign language anxiety and enjoyment are closely related, justify the present research, which seeks to explore the effects of a technology-based intervention on interpreting classroom anxiety, enjoyment, and performance.

3. Research Design

As discussed in Aydın [22], despite the availability of experimental research on the effects of technology-based interventions in SL/FL teaching and learning (e.g., [26]), such research is still inadequate given the complexity of both language learning and technology, which further justifies the present study.

3.1. Context

This study was implemented with undergraduate English majors in a state-owned university in Beijing. English majors in this university often take various skill-specific courses in their first year, language enhancement courses, including interpreting and translation courses, in their second year, and varied content courses in their third and fourth years. When the study was conducted, there were four classes of students who registered in the interpreting and listening course, which aimed to train second-year students to consecutively interpret Chinese to English and vice versa. The course was offered once a week during the 18-week term, with 100 min for each meeting.

The course was taught by two instructors, with two classes for each instructor. Both instructors (A and B) were female in their late thirties and held a PhD degree in translation. They prepared the teaching plan together and instructed the course in a similar way. They clearly stated the course objectives in the first class, explicitly explained the rules and strategies students need to know about interpreting from one language to another, played carefully selected video/audio clips for students to listen to and interpret, commented on students' interpreting ability, organized classroom discussions on interpreting, and assigned after-class interpreting exercises.

To help improve students' confidence and competence in interpreting back and forth from Chinese to English, instructor A required each student in her two classes to complete extra technology-based interpreting practice every week, which included listening to a five-minute news report on any topic of the week in English or Chinese and interpret it into the opposite language, record both the source report and the interpretation and submit the recordings to the classroom platform to share with the class. Then, the instructor and the class chose to listen to and comment on the recorded interpretation. It was termed technology-based practice because technology was involved throughout the whole process

of the practice. Additionally, both the teacher and students could have a record of the practice each student completed every week. Students could even play back their own recorded interpretation, reflect on it, and improve their interpreting thereafter. These could not be afforded by practice without technology. Apart from what was commonly required, instructor B did not require her students to complete extra interpreting practice but encouraged them to do so.

To test the effects of this technology-based practice on students' interpreting anxiety, enjoyment, self-efficacy, and performance, this study used instructor A's two classes as the experimental group and instructor B's two classes as the control group (those who did not complete any required extra interpreting practice). Moreover, the use of technology-based practice in the experimental group and normal classroom teaching and learning in the control group were treated as two different learning modes in the research.

3.2. Participants

Both convenience sampling and cluster sampling were used to recruit participants in this study since this university happened to have four classes of students enrolled in the same interpreting and listening course. Then, the students of the classes who agreed to participate in the study signed consent forms, which resulted in a total of 90 (13 male and 77 female) participants who were second-year students and had an average age of 20.13 years (SD = 0.99). The experimental group had 44 (9 male and 35 female) participants, and the control group had 46 (4 male and 42 female) students.

3.3. Instruments

The instruments employed in this research included a nine-item interpreting classroom enjoyment scale, an eight-item interpreting classroom anxiety scale, a three-item interpreting self-efficacy scale, and an interpreting test, as expounded below.

Interpreting classroom anxiety scale: To measure the anxiety students experienced in their interpreting and listening classes, the eight-item unidimensional interpreting classroom anxiety scale (ICAS) was adapted from the short-form FLCAS validated by Botes et al. [20] in this study. To better suit this study, the expression "foreign language" in the original items was changed to "interpreting and listening". Example items were "I start to panic when I have to interpret without preparation in my interpreting and listening class" and "I always feel that my classmates interpret better than I do" (see Appendix A, items 1–8).

Interpreting classroom enjoyment scale: The nine-item interpreting classroom enjoyment scale (ICES) was adapted from the short-form FLES validated by Botes et al. [42] in this research, aiming to measure the enjoyment students experienced in their interpreting and listening classes. To suit this research better, the expression "foreign language" was changed to "interpreting and listening". Sample items were "We laugh a lot in the interpreting and listening class" and "My Interpreting and Listening teacher is supportive". As discussed by Botes et al. [42] and Xu and Liu [12], the ICES consists of three components: the three-item teacher appreciation subscale (TAS), the three-item personal enjoyment subscale (PES), and the three-item social enjoyment subscale (SES) (see Appendix A, items 9–17).

Interpreting self-efficacy scale: Self-efficacy, which refers to one's belief in their ability to successfully solve issues in specific situations, determines a person's resilience, efforts and calmness when facing challenging goals [53]. The current literature indicates that self-efficacy is closely correlated with learner emotions and SL/FL achievement (e.g., [12,22,50,51]). Hung [54] believed that enjoyment positively contributed to self-efficacy. Nevertheless, studies on self-efficacy in relation to learner emotions and language achievement, interpreting competence in particular, are not many. Because of this, students' interpreting self-efficacy was also measured in the present research. To gauge students' self-efficacy in interpreting, the three-item unidimensional interpreting self-efficacy scale (ISES) used by Xu and Liu [12] was employed in this study. An example

item was "I believe I have the ability to learn interpreting well" (see Appendix A, items 18–20).

All the scales were seven-point Likert scales, ranging from "strongly disagree" to "strongly agree", with values of 1–7 assigned to the alternatives. Hence, a higher ICAS score meant higher anxiety and a higher ICES score indicated greater enjoyment in the interpreting and listening class, and a higher ISES score suggested greater self-efficacy in interpreting. The primary characteristics of the scales are reported in Table 1, which reveals fairly high reliability for the measures in each phase for both the experimental and control groups.

Table 1. Characteristics of the scales.

Group		Experimental Group (N = 44)			Control Group (N = 46)		
Measures		ICAS	ICES	ISES	ICAS	ICES	ISES
No. of items		8	9	3	8	9	3
Reliability	Pre-test	0.922	0.917	0.896	0.923	0.916	0.901
	Post-test	0.891	0.853	0.901	0.905	0.861	0.893

Notes: ICAS = interpreting classroom anxiety scale; ICES = interpreting classroom enjoyment scale; ISES = interpreting self-efficacy scale.

Interpreting performance: Performance in interpreting was assessed using an interpreting test, which consisted of two parts: a 5-minute task of interpreting a recent news report from Chinese to English and a 5-minute task of interpreting a recent news report from English to Chinese. Each part had a total score of 20, and the total score of the interpreting test was 40. Each test took up 10% of the final course grade.

3.4. Data Collection and Analysis

This quasi-experimental study was approved by the ethics committee of the author's institution and strictly followed all research ethics. It collected data over a 12-week period of an 18-week semester. In week 1, the instructors clearly stated the course objectives and requirements and described the classroom activities and technology-based practice to be completed in the respective classes. Students signed a consent form, answered the questionnaires, and completed the interpreting test in week 3 (phase 1), which was completed again in week 15 (phase 2). Each student's performance in the interpreting test was recorded, which was then scored holistically by the two instructors using the interpreting scoring rubric developed out of the criteria described by Bühler [55] (Appendix B) on a scale of 1–5. The rubric had four dimensions: informational equivalence, fluency of delivery, correct terminology, and correct grammar, with a score of 1–5 for each dimension. With an inter-rater reliability of 0.921, the two scores for each student were averaged, which was then used as the final score of the student's interpreting test.

SPSS 22 was deployed to analyze the collected data. Reliability scores, means, and standard deviations were computed to reveal the respondents' levels of interpreting classroom anxiety and enjoyment, self-efficacy, and performance. Paired samples *t*-tests were run to examine the differences in interpreting classroom anxiety, enjoyment, self-efficacy, and performance of the experimental and control groups between the pre- and post-tests; independent samples *t*-tests were run to investigate the differences in the measured variables between the experimental and control groups before and after the intervention, respectively. Then, a one-way between-group analysis of covariance (ANCOVA) (the co-variates included pre-test ICAS, ICES, ISES, and interpreting test scores) was performed to examine the impact of technology-based practice on the measured variables.

4. Results

4.1. Changes in Interpreting Emotions and Performance between the Pre- and Post-Tests

To explore the differences in interpreting classroom anxiety, enjoyment, self-efficacy, and performance of the experimental and control groups in phases 1 and 2, paired sam-

ples t-tests were conducted between the pre-and post-test scores of the ICAS, ICES, and ISES scales as well as the interpreting tests. The findings are summarized in Table 2, which indicates that students in the experimental group had a lower score on the ICAS (mean = 4.80/4.12) and a higher score on the ICES scales (mean = 4.79~5.94/5.26~6.26), ISES (mean = 4.66/5.30), and interpreting performance (mean = 5.31/6.23) in phase 2 than they did in phase 1. The differences in all the measured variables, except for TAS, were statistically significant, with t values ranging from −2.671 to 4.256 ($p \leq 0.05$), as proven by the paired samples *t*-test results presented in Table 2. The effect size for each statistical difference was medium (d = 0.39~0.796). This meant that after the intervention, the experimental group felt significantly less anxious, experienced significantly greater enjoyment, and had significantly greater self-efficacy in interpreting in their interpreting class. They also performed significantly better in the interpreting test.

Table 2. Means and SDs of interpreting emotions and performance of the experimental and control groups.

		Pre-Test		Post-Test		Paired Samples *t*-Test Results		
		Mean	**SD**	**Mean**	**SD**	**t**	***p***	**Cohen's d**
Experimental group (N = 44)	ICAS	4.80	1.15	4.12	0.83	4.256 **	0.000	0.69
	ICES	5.21	1.08	5.71	0.97	−3.413 **	0.002	0.49
	TAS	5.94	1.12	6.26	0.93	−1.09	0.191	/
	PES	4.90	1.19	5.41	0.95	−3.733 **	0.000	0.47
	SES	4.79	1.32	5.26	1.06	−2.671 *	0.030	0.39
	ISES	4.66	1.26	5.30	0.95	−4.977 **	0.000	0.57
	IP	5.31	1.13	6.23	1.18	−5.158 **	0.000	0.796
Control group (N = 46)	ICAS	4.74	1.18	4.36	0.75	3.646 **	0.001	0.38
	ICES	5.28	0.94	5.62	0.77	−3.512 **	0.001	0.396
	TAS	6.196	0.94	6.30	0.98	−1.081	0.271	/
	PES	5.04	1.09	5.22	0.97	−1.489	0.127	/
	SES	4.77	1.40	5.23	1.36	−3.523 **	0.001	0.33
	ISES	4.61	1.27	4.98	1.13	−4.096 **	0.000	0.31
	IP	5.43	1.26	5.91	1.19	−4.40 **	0.000	0.39

Notes. ** = $p \leq 0.01$, * = $p \leq 0.05$; effect size of Cohen's d: small = d ≤ 0.2; medium = d = 0.5; large = d ≥ 0.8 [56]; ICAS = interpreting classroom anxiety scale; ICES = interpreting classroom enjoyment scale; TAS = teacher appreciation subscale; PES = personal enjoyment subscale; SES = social enjoyment subscale; ISES = interpreting self-efficacy scale; IP = interpreting performance.

Similarly, the control group also scored lower on the ICAS but higher in all the other measures in phase 2 than in phase 1. The differences in all the measures, except for TAS and PES, were statistically significant, with t values ranging from −3.512 to −4.40 ($p \leq 0.001$) (see Table 2). Furthermore, the effect size for each statistical difference was generally medium (d = 0.31~0.396). This indicated that the control groups felt significantly less anxious and more joyful, had significantly greater self-efficacy in interpreting, and performed significantly better in the interpreting test after the intervention.

4.2. Differences in Interpreting Emotions and Performance between the Experimental and Control Groups

As reported in Table 2, the students in the experimental group (mean = 4.66~5.94) scored similar on the measures as their peers in the control group (mean = 4.61~6.196). No significant difference occurred in any of the measures between the two groups in phase 1, as supported by the independent samples *t*-test results displayed in Table 3. This meant that prior to the intervention, the experimental and control groups were at similar levels of interpreting classroom anxiety, enjoyment, self-efficacy, and performance.

Table 3. Independent samples *t*-test results of the measures.

Measure	Pre-Test			Post-Test		
	t	*p*	Cohen's d	t	*p*	Cohen's d
ICAS	0.241	0.810	/	−20.332 *	0.05	0.30
ICES	−10.213	0.229	/	0.814	0.473	/
TAS	−10.179	0.242	/	−0.116	0.890	/
PES	−0.246	0.227	/	10.781	0.101	/
SES	0.069	0.945	/	0.198	0.761	/
SEFS	−0.815	0.417	/	30.870 **	0.000	0.31
IC	−0.059	0.953	/	30.246 **	0.003	0.27

Notes. ** = $p \leq 0.01$; * = $p \leq 0.05$; effect size of Cohen's d: small = d $\leq$ 0.2; medium = d = 0.5; large = d $\geq$ 0.8 [56].

Table 2 also demonstrates that the students in the experimental group scored lower on the ICAS and TAS yet higher on the other measures than their peers in the control group in phase 2. Additionally, the differences on the ICAS (t = −2.332, p = 0.05), ISES (t = 3.870, p = 0.000), and IC (t = 3.246, p = 0.003) were statistically significant with a medium effect size (d = 0.227~0.31), as proven by the independent sample *t*-test results reported in Table 3. This implies that the experimental group reported experiencing significantly lower anxiety in the interpreting and listening class, had significantly greater self-efficacy in interpreting, and achieved significantly higher scores on the interpreting test than the control group after the intervention.

4.3. Effects of Technology-Based Practice on Interpreting Emotions and Performance

In order to examine the impacts of technology-based practice on interpreting emotions and performance, a one-way between-group analysis of covariance (ANCOVA) was run on the ICAS, ICES, ISES, and interpreting test scores, and the use of technology-based practice in the experimental group and the normal classroom without technology-based practice were used as two different learning modes. Preliminary checks were conducted to ascertain that no violation existed in the assumptions of normality, linearity, homogeneity of regression slopes, homogeneity of variances, and reliable measurement of the covariate.

4.3.1. Effects on Interpreting Classroom Anxiety

To explore the impact of technology-based practice on students' interpreting classroom anxiety, an ANCOVA was conducted with post-test ICAS scores as the dependent variable, learning modes as the independent variable, and pre-test ICAS scores as a covariate. The findings are presented in Table 4, which demonstrates that learning modes had a significant impact on the students' post-test ICAS scores (F = 9.762, p = 0.002, partial Eta squared = 0.032).

Table 4. Results of the ANCOVA on interpreting classroom anxiety.

Resources	Type III Sum of Squares	df	Mean Square	F	*p*	Partial Eta Squared
Intercept	34.069	1	34.069	79.152	0.000	0.476
Pre-test ICAS (covariate)	17.962	1	17.962	41.73	0.000	0.324
Learning modes	14.758	1	14.758	9.762 **	0.002	0.032
Error	37.447	87				

Notes. ** = $p \leq 0.01$.

4.3.2. Effects on Interpreting Classroom Enjoyment

To examine the effects of technology-based practice on interpreting classroom enjoyment, an ANCOVA was run with post-test ICES scores as the dependent variable, learning modes as the independent variable, and pre-test ICES scores as a covariate. The findings

are summarized in Table 5, which suggests that the learning modes did not significantly affect the participants' post-test interpreting classroom enjoyment (F = 2.836, p = 0.179, partial Eta squared = 0.007).

Table 5. Results of the ANCOVA on interpreting classroom enjoyment.

Resources	Type III Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Intercept	23.061	1	23.061	44.813	0.000	0.340
Pre-test ICES (covariate)	23.205	1	23.205	45.094	0.000	0.341
Learning modes	1.945	1	1.945	2.836	0.179	0.007
Error	44.771	87				

4.3.3. Effects on Interpreting Self-Efficacy

To explore the effects of technology-based practice on the respondents' interpreting self-efficacy, an ANCOVA was conducted with post-test ISES scores as the dependent variable, learning modes as the independent variable, and pre-test ISES scores as a covariate. The findings are shown in Table 6, which implies that the learning modes significantly affected the participants' post-test self-efficacy in interpreting (F = 6.218, p = 0.031, partial Eta squared = 0.027).

Table 6. Results of the ANCOVA on interpreting self-efficacy.

Resources	Type III Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Intercept	59.051	1	59.051	71.516	0.000	0.451
Pre-test ISES (covariate)	22.808	1	22.808	27.622	0.000	0.241
Learning modes	12.657	1	12.657	6.218 *	0.031	0.027
Error	45.837	87				

Notes. * = $p \leq 0.05$.

4.3.4. Effects on Interpreting Performance

To explore the effects of technology-based practice on the participants' interpreting performance, an ANCOVA was employed with post-test interpreting test scores as the dependent variable, learning modes as the independent variable, and pre-test interpreting test scores as a covariate. The findings are presented in Table 7, which suggests that the learning modes significantly impacted the respondents' post-test interpreting performance (F = 5.773, p = 0.045, partial Eta squared = 0.027).

Table 7. Results of the ANCOVA on interpreting performance.

Resources	Type III Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Intercept	31.827	1	31.827	31.161	0.000	0.278
Pre-test IP (covariate)	33.131	1	33.131	32.437	0.000	0.286
Learning modes	13.832	1	13.832	5.773 *	0.045	0.023
Error	46.732	87				

Notes. * = $p \leq 0.05$.

5. Discussion

5.1. Changes in Interpreting Emotions and Performance between the Pre- and Post-Tests

The paired samples *t*-tests showed that after the 12-week intervention, the respondents in both the experimental and control groups became significantly less anxious, experienced significantly greater enjoyment, had significantly greater self-efficacy in their interpreting class, and performed significantly better in the interpreting test. Though no similar research on students of interpreting could be compared, the change in interpreting classroom anxiety was largely in line with the finding in extant diachronic studies on foreign language anxiety in SL/FL contexts (e.g., [5,21,26,57,58]). As discussed in these studies, as time progressed, students often had more exposure to and practice of the SL/FL, which helped enhance their confidence in learning/using the language and improve their proficiency in the language. Then, students gradually became less and less anxious and more and more confident in their foreign language classrooms. Similarly, as the students had more practice in interpreting in class in the present study, they might have become (more) accustomed to different speakers' accents and speeds, topics of the speeches, and strategies required for interpreting. Consequently, they might have enjoyed interpreting and become less anxious and more confident in their ability to interpret well, ultimately leading to improved performance in interpreting.

5.2. Effects of Technology-Based Practice on Interpreting Emotions and Performance

The independent samples *t*-tests and ANCOVA results answered whether and how technology-based practice affected interpreting classroom anxiety, enjoyment, self-efficacy, and performance. The independent samples *t*-tests revealed no significant difference in the latter in phase 1, indicating that the two groups were at a similar level before the intervention. However, the tests indicated that after the 12-week intervention, the experimental group reported feeling significantly less anxious in the interpreting and listening class, had significantly greater self-efficacy in interpreting, and performed significantly better than their peers in the control group. These findings were generally supported by the ANCOVA results, which revealed that technology-based practice had a significant effect on students' interpreting classroom anxiety, self-efficacy, and performance.

These findings clearly demonstrated that technology-based practice helped reduce participants' interpreting classroom anxiety and enhance their interpreting self-efficacy and performance, largely in alignment with those in studies with other interventions (e.g., [5,26]). As previously discussed, the use of technology (i.e., computers, the internet, and multimedia, etc.) in education provides significant resources for teaching and learning and a platform for instructors and learners to share information and communicate ideas conveniently and in a timely manner. Technology-based practice was such an example, which provided an adequate chance for the participants to practice and reflect on their own interpreting, and review and comment on others' interpreting outside the classroom. As a result, the experimental group outperformed their peers in the control group in interpreting classroom anxiety, self-efficacy, and performance.

Unexpectedly, technology-based practice seemed to have no significant effect on the participants' interpreting classroom enjoyment. This might be because the respondents, as English majors, generally knew the importance of interpreting and enjoyed their interpreting class. Moreover, because successful interpreting requires full attention all the time, technology-based practice did not add more to the experimental group's enjoyment in the interpreting and listening classroom. Another possible reason was that FLE might be more teacher-dependent, as implied by Dewaele and Dewaele [59], who found that FLCA was constant with both teachers, but FLE was significantly different when the teachers were different.

6. Conclusions

The present quasi-experiment explored the effects of technology-based practice on Chinese university English majors' interpreting classroom anxiety, enjoyment, self-efficacy,

and performance over a 12-week period. The study revealed significant changes in interpreting emotions and performance in both the experimental and control groups between the pre- and post-tests (research question 1) and significant effects of technology-based practice on interpreting classroom anxiety, self-efficacy, and competence (research question 2), showcasing the importance of (technology-based) interventions in helping students learn/use an SL/FL (more) confidently and effectively.

As described in the research design, to increase students' interpreting ability, instructor A required her students to practice interpreting a 5-minute news report, record the interpretation, and share the recording with the class outside the classroom every week, in addition to normal teaching and learning. Twelve weeks' practice thus provided substantial chances for the students to practice listening to, analyzing, and comprehending the source texts, taking notes and memorizing information, organizing the information, and speaking it out in the target language. Hence, this practice also developed or even increased the students' analytical, organizational, cognitive as well as linguistic abilities. It could also expand the students' knowledge and familiarize them with varying topics and speech styles. All these finally led to reduced anxiety, enhanced confidence, and performance in interpreting, as discussed in studies on learner emotions (FLA in particular) and language learning in other contexts (e.g., [26,43,60,61]). Thus, it is important to increase students' practice of interpreting, which can be performed through the instructor's requirements or on the students' own will thanks to the wide use of technology. The instructor's requirements may provide a more sustainable motive for students to continue practicing interpreting in spite of difficulty and a chance for students to assess their progress and learn from one another. Gradually, students may become more positive and proactive in interpreting, leading to sustainable development in their interpreting competence. Moreover, technology-based practice can be sustainably used in different areas of SL/FL teaching and learning.

The present study was one of the few that utilized a quasi-experimental method to investigate the effects of interventions on learner emotions in an interpreting class. It showed that technology-based practice significantly reduced interpreting classroom anxiety and increased interpreting self-efficacy and competence, implying that the practice benefited the participants' learning of interpreting. Hence, this study enriches the extant literature, which is short of experimental research on the impacts of interventions on the teaching and learning of interpreting. Moreover, since technology-based practice can be sustainably used, this study indicates that technology-based practice can be incorporated into interpreting teaching and learning and other areas of language education.

Despite the constructive findings, the present study had certain limitations. First, it was uncertain whether the participants in the control group continuously practiced interpreting on their own outside the classroom, which might have affected the findings. Future research should take appropriate tactics to reduce or avoid such risks. Second, qualitative data would have helped us better understand how technology-based practice helped decrease the participants' interpreting classroom anxiety and improve their interpreting self-efficacy and competence. Then, specific strategies can be applied in interpreting classrooms. This needs to be further researched. Third, as learner factors such as gender, age, and language aptitude affect SL/FL teaching and learning to varying degrees [62,63], they should affect interpreting teaching and learning as well. Thus, future research should consider the effects of such individual variables when exploring the varying effects of (technology-based) interventions on interpreting emotions and performance. The findings may then, in return, provide useful insights for the design and development of interventions and the use of technology in education.

Funding: This research was sponsored by 2021 Top-Notch Students of Basic Disciplines Training Program 2.0 Project (No. 20222015).

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by Tsinghua University Science and Technology Ethics Committee (Humanities, Social Sciences and Engineering) (Project No.: THU-04-2024-42, 27 May 2024).

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

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Acknowledgments: Author appreciates Ning Du's contribution to proofreading this manuscript.

Conflicts of Interest: The author declares no conflict of interest.

Appendix A. Interpreting and Listening Classroom Learning Questionnaire

Instructions: This part has 20 items. Please circle a choice for each item from the seven alternatives that best suits you: "strongly disagree" (SD = 1), "disagree" (D = 2), "slightly disagree" (SDL = 3), "don't know" (DK = 4), "slightly agree" (SAG = 5), "agree" (A = 6), and "strongly agree" (SA = 7). There are no right or wrong answers and all the information collected will be used for research only.

Items	SD	D	SDL	DK	SAG	A	SA
1. Even if I am well prepared for my Interpreting and Listening class, I feel anxious about it.	1	2	3	4	5	6	7
2. I always feel that my classmates interpret better than I do.	1	2	3	4	5	6	7
3. I can feel my heart pounding when I'm going to be called on in my Interpreting and Listening class.	1	2	3	4	5	6	7
4. I don't worry about making mistakes in my Interpreting and Listening class.	1	2	3	4	5	6	7
5. I feel confident when I interpret in my Interpreting and Listening class.	1	2	3	4	5	6	7
6. I get nervous and confused when I am interpreting in my Interpreting and Listening class.	1	2	3	4	5	6	7
7. I start to panic when I have to speak without preparation in my Interpreting and Listening class.	1	2	3	4	5	6	7
8. It embarrasses me to volunteer answers in my Interpreting and Listening class.	1	2	3	4	5	6	7
9. My Interpreting and Listening teacher is encouraging.	1	2	3	4	5	6	7
10. My Interpreting and Listening teacher is friendly.	1	2	3	4	5	6	7
11. My Interpreting and Listening teacher is supportive.	1	2	3	4	5	6	7
12. I enjoy my Interpreting and Listening class.	1	2	3	4	5	6	7
13. I've learned interesting things from my Interpreting and Listening class.	1	2	3	4	5	6	7
14. I am proud of my accomplishments in interpreting and listening.	1	2	3	4	5	6	7
15. We form a tight group in the Interpreting and Listening class.	1	2	3	4	5	6	7
16. We laugh a lot in the Interpreting and Listening class.	1	2	3	4	5	6	7
17. We have common 'legends,' such as running jokes.	1	2	3	4	5	6	7
18. I believe I have the ability to learn interpreting well.	1	2	3	4	5	6	7
19. I believe I have the ability to find the effective way to learn interpreting.	1	2	3	4	5	6	7
20. I believe I have the ability to become a competent interpreter.	1	2	3	4	5	6	7

Appendix B. Interpreting Scoring Rubric

Criteria	5	4	3	2	1
Informational equivalence	Information interpreted is complete and equivalent with that in the source language	Information interpreted is nearly complete and equivalent with that in the source language	Some information is missing. Some information interpreted is not equivalent with that in the source language	Much information is missing. Much information interpreted is not equivalent with that in the source language	Most information is missing. Most information interpreted is not equivalent with that in the source language
Fluency of delivery	Delivery of information interpreted is fluen	Delivery of information interpreted is fairly fluent	Delivery of information interpreted is moderately fluent	Delivery of information interpreted is slightly fluent	Delivery of information interpreted is not fluent

Criteria	5	4	3	2	1
Correct terminology	Interpretation of the terms is correct	Interpretation of the terms is fairly correct	Interpretation of the terms is moderately correct	Interpretation of the terms is slightly correct	Interpretation of the terms is not correct
Correct grammar	Grammar is correct	Grammar is fairly correct	Grammar is moderately correct	Grammar is slightly correct	Grammar is not correct

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