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The Impact of Cymo Note on Consecutive Interpreting Training: A Pilot Study with Chinese University Students

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Abstract

This pilot experiment investigates the impact of a note-taking-assisted application, Cymo Note, on the teaching and learning of English to Chinese consecutive interpreting (CI). Adopting a mixed-methods design, 5 senior Translation Major students from a private university in Guangdong were engaged. The students used Cymo Note within an undergraduate CI course. Data were collected via pre and post-performance evaluation (accuracy, fluency, expression) and post-course questionnaire. Quantitative results from paired t-tests demonstrated statistically significant improvements in the students' total score ($p < .01$, $d = 5.54$) and across all sub-categories: accuracy ($p < .01$, $d = 4.38$), fluency ($p < .05$, $d = 2.00$), and expression ($p < .01$, $d = 2.92$). Qualitative data from the post-course questionnaire indicated that students perceived Cymo Note as effective in reducing cognitive load and supporting comprehension, though they also reported a learning curve associated with its operational demands. The study concludes that Cymo Note holds significant potential as a pedagogical scaffold in interpreter training by supporting accuracy and managing cognitive effort. These preliminary findings suggest the value of further large-scale research into the integration of specific note-taking technologies in pedagogical contexts.

Keywords*: Consecutive Interpreting; Cymo Note; Pilot study; Chinese college students.*

1. Introduction

With artificial intelligence (AI) reshaping the present era, swift technological progress has propelled the international reach of language service enterprises. Within this evolving environment, interpreting-related tools and technology are progressing at an ever-accelerating rate. In 2000, the International Association of Conference Interpreters (AIIC) published Code for the Use of New Technologies in Conference Interpreting (2000) through its official website. This issuance affirmed technological competence as an integral, assess-able dimension of interpreter education and professional training. In 2018, the Ministry of Education issued the Education Informatization 2.0 Action Plan, identifying the shift from enhancing teachers' and students' ability to apply information technology toward holistically advancing their information literacy as a foundational goal. Subsequently, the Implementation Plan for Accelerating Education Modernization (2018-2022), jointly promulgated in 2019 by the Central Committee of the Communist Party of China and the State Council, designated the vigorous promotion of education informatization as one of the ten strategic priorities for the ensuing five years (2019).

Within this context, interpreter education must not only keep pace with technological change but also critically evaluate how specific tools can be integrated to enhance pedagogical outcomes.

Within this framework, human interpreters remain central both in the act of interpreting and in the strategic use of technology. In this study, Cymo Note functions as a supportive tool. It was selected for investigation due to its potential to directly address core cognitive challenges in CI training. First, it incorporates an automatic speech recognition (ASR) system capable of transcribing speech into text and displaying it on the interface. This functionality allows interpreters to read the source text while rendering it into the target language. The process expected to alleviate memory load and performance pressure, thereby enhancing overall interpreting quality. Second, Cymo Note preserves the essential skill of note-taking by featuring a split-screen interface. The left pane displays the ASR-generated text, while the right pane allows for manual notation, maintaining a link to traditional practice while offering technological support.

The primary objective of this pilot study is to empirically assess the impact of Cymo Note on English-Chinese CI performance. It seeks to determine to what extent the tool influences the quality of student output, specifically in terms of accuracy, fluency, and expression. Furthermore, the study investigates the perceptions of university students towards using Cymo Note in the classroom, exploring its utility as a learning aid. By providing evidence on both the measurable outcomes and user reception of a specific technological tool, this research aims to contribute a nuanced case study to the broader discourse on effectively leveraging technology to foster learner independence and bridge theory with practice in interpreter education.

2. Research Objectives

Since the number of empirical studies on specific technologies in interpreter training is till insufficient (Fantinuoli, 2018), this pilot study aims to provide an initial evaluation of Cymo Note in a Chinese university setting. The objectives are as follows:

1. To evaluate the impact of Cymo Note on the quality of students' English-Chinese CI performance, specifically in terms of accuracy, fluency, and expression.
2. To assess the perception of Chinese university students towards the use of Cymo Note in the class.

3. Research Questions

The present study aimed to answer the following questions:

1. To what extent does the use of Cymo Note influence students' E-C interpreting performance in terms of accuracy, fluency and expression?
2. How do students in CI class perceive the use of Cymo Note as an aid in CI training?

4. Literature Review

This section is composed by three parts, which are theoretical framework, conceptual framework and review of related literature. It lays foundation for this paper.

4.1 Theoretical Framework

The present study is grounded in complementary strands of theory that illuminate how a note-taking assistance tool can influence the cognitive processes and pedagogical outcomes in CI training. The framework is built upon a clear problem statement, the significant cognitive challenges inherent in the traditional note-taking process during CI, and integrates theories of cognition and pedagogy to analyze the potential role of Cymo Note as a supportive intervention.

The act of note-taking is a central yet cognitively demanding component of CI. Students must rapidly create a personalized, language-neutral symbolic system to offload memory and support reformulation. According to Gile's Effort Models (EM) (2009, 2023) , the "Note-Taking Effort" directly competes for finite cognitive resources with the "Listening and Analysis Effort" and the "Memory Effort." This competition often creates a cognitive bottleneck. A student's intense focus on formulating notes can lead to lapses in listening comprehension or failures in memorizing segments of the speech, resulting in omissions and inaccuracies.

It is further explained by Cognitive Load Theory (Sweller, 2011), which distinguishes between the intrinsic load of understanding the complex message, the germane load required for constructing a fluent target-language rendition, and the extraneous load imposed by the mechanics of the task itself. In traditional CI training, the manual act of note-taking under severe time pressure constitutes a high extraneous load. This load can overwhelm a student's working memory, leaving insufficient capacity for the essential cognitive activities of deep comprehension and reformulation. Consequently, the introduction of the note-taking assistance tool Cymo Note is theorized to function as a cognitive scaffold. By providing a real-time transcript alongside a digital notepad, the tool is positioned to reduce the extraneous load associated with the mechanics of note-taking. This reduction may free cognitive resources, allowing students to allocate more effort to analytical listening and memory, thereby creating the conditions for improved performance in terms of accuracy and fluency.

The effective use of technology in education requires more than its mere availability. It demands a thoughtful integration into the instructional context. The Technological Pedagogical Content Knowledge (TPACK) model (Baran et al., 2011; TPACK, 2010) provides a critical lens for this aspect of the study. TPACK posits that meaningful technology integration resides at the intersection of three knowledge domains: Content Knowledge (CK), which in this case is the theory and practice of CI and note-taking; Pedagogical Knowledge (PK), encompassing the methods for teaching these skills; and Technological Knowledge (TK), which involves an understanding of the specific affordances of Cymo Note. This framework moves the inquiry beyond a simple evaluation of the tool's utility to an investigation of its pedagogical design and reception. It informs the design of the classroom intervention and, more importantly, provides a structure for analyzing student perceptions. How learners perceive the tool's impact on their learning

process, its usability, and its integration into their practice offers invaluable insight into the practical realization of the TPACK dynamic within the interpreter training classroom.

4.2 Conceptual Framework

The conceptual framework (see Figure 1) for this study visualizes the logical flow from its theoretical foundations to its research design and anticipated outcomes, illustrating the relationship between variables. This framework is built upon the premise that the note-taking assistance tool, Cymo Note, functions as an external scaffold designed to mitigate the cognitive load associated with the note-taking effort in CI.

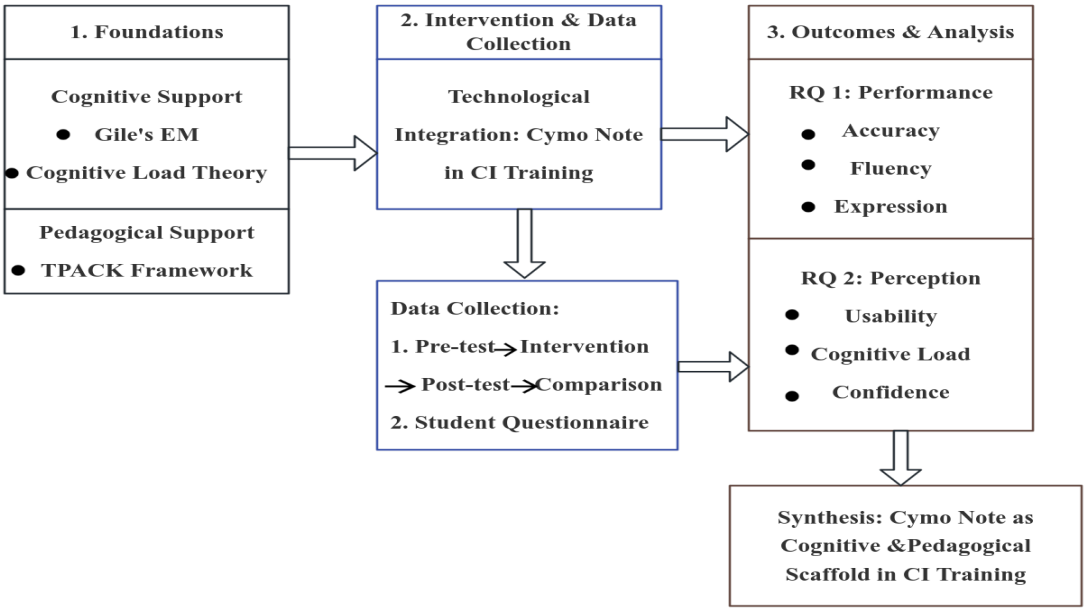

Figure 1. Conceptual Framework

The framework posits that the integration of Cymo Note into the pedagogical environment constitutes the independent variable. This intervention is theorized to directly influence two primary dependent variables. The first is interpreting performance, which is operationalized through measurable gains in accuracy, fluency, and expression between pre-test and post-test assessments. From the Figure, it can be seen that this relationship is explained through the cognitive lens of Gile's Effort Models and Cognitive Load Theory. By providing a reliable transcript, the tool is expected to reduce the extraneous cognitive load of manual note-taking, thereby freeing up working memory resources. These reallocated resources can then be directed toward enhancing the listening and analysis effort and the memory effort, which is hypothesized to manifest as improved performance scores.

The second dependent variable is the students' perception of the tool's utility and integration. This dimension is investigated through a questionnaire and is understood through the lens of the TPACK framework. The students' perceptions provide critical feedback on the pedagogical soundness of the technological integration, reflecting on its usability, and perceived benefit in supporting their skill development. Their experiences

illuminate the practical success of aligning technological knowledge with pedagogical methods and interpreting content knowledge.

The conceptual framework, therefore, depicts a causal pathway: the pedagogical integration of the Cymo Note tool acts as an intervention that targets a specific cognitive challenge. This intervention is expected to yield two distinct but complementary types of evidence: quantitative data on its impact on performance (answering RQ1) and qualitative data on its reception and perceived effectiveness within the learning process (answering RQ2). The synthesis of these findings will provide a holistic evaluation of Cymo Note's role as a cognitive and pedagogical scaffold in interpreter training. This integration aligns with Chinese policy documents such as the Education Informatization 2.0 Action Plan and the Implementation Plan for Accelerating Education Modernization, which call for technology-enhanced yet learner-cantered CI education.

4.3 Related Researches

Research into computer-assisted interpreting tools (CAIT) has shifted from early glossary-based systems to multifunctional, AI-enhanced platforms. Early tools such as InterpretBank (Fantinuoli, 2016) focused on terminology management; newer systems incorporate ASR, predictive text, and multi modal interfaces to aid comprehension and delivery (Fantinuoli, 2023). This aligns with the core function of Cymo Note, which integrates ASR-generated text with a digital notepad.

Empirical studies on such integrated tools are emerging. In a Chinese context, Sijia and Jan (2022) found higher re-expression quality when students coupled ASR-supported note displays with deliberate deverbalization. Recent research by Wang and Wang (2023) investigated a different ASR-assisted note-taking system. Their findings indicated that while the technology improved the factual accuracy of interpretations, it also introduced a new cognitive challenge: the need to effectively divide attention between the live transcript and one's own notes. This underscores the complexity of integrating such tools and points to the necessity of pedagogical guidance.

The pedagogical integration of these technologies is critical. Simply providing the tool is insufficient. Its use must be scaffolded within the interpreter training curriculum. Igualada and Echeverri (2019) and Jie (2020) highlight the trend toward embedding digital competence in curricula, while Huashu and Shijie (2021) frame the "technological turn" as an imperative that strengthens, not replaces, the interpretive tradition. The TPACK framework emphasizes the interplay between technology, teaching methods, and the specific content of consecutive interpreting skills. While literature directly applying TPACK to interpreter training is still limited, its principles are reflected in the work of scholars who argue for a balanced approach. The design of Cymo Note, which preserves the manual note-taking pane, inherently supports this principle by aiming to augment, rather than replace, the interpreter's strategic note-taking skills.

This study contributes to this growing body of literature by providing a focused empirical evaluation of Cymo Note. It investigates its specific impact on the quality dimensions of accuracy, fluency, and expression, while also exploring the student experience of integrating this particular tool into their learning process.

5.Research Methodology

5.1 Research Design

As a pilot study, pre-post experiment design was employed. It involved three stages. The first stage was preparation, in which Table 1: E-C Interpreting Quality Assessment Rubic had been set to compare students' performance before and after the implementation of Cymo Note. The testing materials were prepared. The source material was drawn from the China Accreditation Test for Translators and Interpreters (CATTI), one of the most highly regarded examinations in the field. The selected passage was divided into two parts of comparable difficulty, consisting of 188 and 182 words respectively. The first testing text comprised six segments, each ranging from 17 to 40 words, while the second also contained six segments, but with lengths between 20 and 37 words. Both texts included proper nouns and numerical data.

A Perception Questionnaire had been designed to assess the perception of students towards the technology-assisted model in CI classes. In addition, applications and websites such as Cymo Note (https://www.cymo.io/note), IFLYREC, Questionnaire Star (https://www.wjx.cn/) and SPSSAU (https://spssau.com/?107000000) were installed, registered, familiarized, and employed for both the experimental procedures and subsequent data analysis. Supplementary resources, including assessment materials, microphones, seating arrangements, and stationery were likewise made ready in advance.
The second stage was implementation. Five students were selected to participate two E-C interpreting tests. During the pre-test, they were not allowed to use Cymo Note in interpreting but used the traditional way. In the post-test, they were allowed to use Cymo Note. During the tests, each segment was followed by a 30-second pause for students to render their interpretations. Participants began speaking at the auditory cue "Ding" and concluded upon hearing the same signal. The passage was delivered only once, and the full testing procedure lasted approximately ten minutes. After these two tests, recordings of E-C interpreting, with and without the help of Cymo Note, were collected for further analysis. Then Perception Questionnaire was sent to these students to get their feedback about technology-assisted CI and judgments about their performance. The data for this questionnaire was analyzed and collected by Questionnaire Star.

The third stage was data analysis. At this phase, multiple objectives were addressed. Foremost among them was an examination comparing the results of students' two assessments (one conducted with, and the other without, the aid of Cymo Note). Performance was evaluated on a segment-by-segment basis, considering accuracy, fluency, and expressive quality. Scores were assigned according to these three evaluative dimensions. The second one was the analysis of students' questionnaire after tests. From the result to analyze their feedback.

5.2 Participants

The subjects were 5 senior Translation students that commenced their undergraduate studies in the fall of 2021 in X University where the researcher is employed. It was consisted by one male, and four females aged between 19 to 21 years old. They had finished 3 years' courses, mainly include Integrated English Course, English Listening, Grammar, Oral English, English-Chinese Translation etc. They had learned Consecutive

Interpreting I-II, the use of Cymo Note and familiar with the form of tests. These students' grades of CI were all above 70 (out of 100). Their overall GPAs ranged from 2.98 to 3.82 on a 4.0 scale, with a cohort average of 3.4. This academic profile indicates that the group was representative of the general English proficiency level among translation majors at the institution.

A purposive sampling method was employed to select participants. This approach was chosen to ensure that all subjects possessed the necessary foundational knowledge and practical experience in consecutive interpreting, thereby enabling a meaningful assessment of the technological intervention. The small sample size of five students is justified by the exploratory nature of this research as a pilot study. A focused, in-depth investigation with a homogenous group was prioritized to yield detailed, qualitative insights and to identify potential trends before undertaking a larger-scale study with a more diverse and randomized sample in the future. All participants were already familiar with the Cymo Note application and the standard testing format used in the study, as these elements had been integrated into their regular coursework.

5.3 Research Instruments

To ensure the experiment runs smoothly and to answer the questions for this research, several software and an assessment rubric were needed to complete the whole experiment, data collection and data analysis. These tools can be divided into pedagogical intervention tools and research-support tools.

The first one is the pedagogical intervention tool: Cymo Note. It is a note-taking application powered by advanced speech-recognition technology. It automatically produces transcripts from spoken input, enabling users to annotate directly within the text or to add notes alongside it for reference. Key terms can be highlighted and instantly translated, and the platform also supports real-time sharing between remote collaborators. This technology-assisted mode contrasts with traditional note-taking, which relies heavily on interpreters' STM and manual note-taking skills. In the conventional approach, pen and paper are the primary, tools available. By integrating Cymo Note into consecutive interpreting classes, students may experience reduced cognitive load and improved accuracy and fluency in their interpretations.

Several other software platforms were used to prepare materials and analyze data, which were not part of the students' learning experience. In preparing the testing materials, the original audio recordings could not be used in their unaltered form because they lacked pauses necessary for the interpreter's delivery. To address this, the open-source audio editing and recording program Audacity was employed. Widely adopted by podcasts, musicians, and other audio practitioners, Audacity offers an extensive suite of functions for audio refinement, including noise reduction, equalization, and precise operations such as cutting, copying, pasting, and trimming segments. The experimental materials were modified within this platform to meet the specific requirements of the study.

The students' interpreting recordings were transcribed using the IFLYREC platform, which reduces the manual workload involved in transcription. The researcher reviewed the output to ensure its correspondence with the original recordings. These

verified transcripts served as the basis for analyzing the interpreters' accuracy and expressive quality.

Over the years, numerous interpreting scholars and professionals have articulated different benchmarks for evaluating interpreting quality. Among these, Seleskovitch (1978) identified "accuracy" and "fluency" as essential. Li Yueran, who served as interpreter for the founding leadership of the People's Republic of China, expanded the standard to "accuracy, fluency, and promptness," later condensed to the three terms themselves (Lin, 1999). Bao Gang (2011), a Chinese researcher in interpreting theory, proposed "comprehensiveness, accuracy, and smoothness" as the key dimensions. Integrating these perspectives, the present study defined an E-C Interpreting Quality Assessment Rubic comprising three core elements: accuracy, fluency, and expression. The weighting of the assessment criteria, Accuracy (50%), Fluency (30%), and Expression (20%), was determined based on established priorities in interpreter training and assessment. The primary emphasis on Accuracy reflects the fundamental objective of interpreting is the faithful and complete transmission of the source message's content and intent. This aligns with the core principle of the Interpretive Theory, which posits that the conveyance of 'sense' is paramount (Seleskovitch & Lederer, 1984), and is consistently treated as the most critical dimension in pedagogical assessment (Gile, 2009). Fluency is weighted as a secondary, yet essential, criterion as it directly impacts the comprehensibility and professional reception of the interpreted output, encompassing delivery features that support effective communication. Finally, Expression, concerning grammaticality and idiomaticity, is assigned a significant but supporting weight, as target-language quality is a prerequisite for professional delivery but remains subordinate to the core tasks of accurate and fluent meaning transfer. This weighting structure is designed to reflect a pedagogical focus on meaning fidelity first, followed by delivery quality.

The specific sub-items (Indices) were synthesized from key scholarly works to ensure a comprehensive assessment. Dimensions such as the preservation of Information and Logic, and correct use of Terminology are central to the cognitive models of interpreting accuracy (Gile, 2009). The components of Fluency, including Speed and Pauses, and the quality of Expression, including Authenticity, are supported by research into interpreting delivery and language quality (Tiselius & Sneed, 2020; Lee, 2008). This synthesis resulted in a framework that is both grounded in theoretical principles and finely tuned for practical assessment in a pedagogical context. Student performances were judged with reference to this standard.

Table 1: E-C Interpreting Quality Assessment Rubic

Criterion	Index	10-9 (Excellent)	8-7 (Good)	6-5 (Adequate)	4-1 (Failing)
Accuracy (50%)	Information	All key messages and details are correctly conveyed. No omissions or additions.	Most key messages are correct. Minor omissions or inaccuracies do not distort the overall meaning.	Central idea is preserved, but with significant omissions or factual errors in details.	Major omissions or distortions of the core message. Information is largely unreliable.

Criterion	Index	10-9 (Excellent)	8-7 (Good)	6-5 (Adequate)	4-1 (Failing)
	Figures	All numbers, names, and specific references are rendered accurately.	Most figures are correct; minor inaccuracies do not affect key data points.	Noticeable errors in figures that affect the understanding of specific information.	Consistent failure to accurately render numbers and specific references.
	Logic	The logical flow, argument structure, and causal relationships are perfectly maintained and clear.	Logic is generally clear, with minor discontinuities that do not impede understanding.	The argument is sometimes disjointed or confusing; logical links are weakened.	Illogical or incoherent rendering; the relationship between ideas is lost.
	Pronunciation	Pronunciation is exceptionally clear and accurate, posing no barrier to comprehension.	Pronunciation is generally clear; occasional minor slips do not hinder understanding.	Pronunciation errors are noticeable and occasionally require listener effort.	Frequent mispronunciations significantly impede comprehension.
	Terminology	All technical and subject-specific terms are rendered accurately and consistently.	Terminology is mostly accurate; occasional minor errors with no major semantic consequence.	Inconsistent or inaccurate use of terminology affects precision.	Widespread incorrect use of terminology severely distorts meaning.
Fluency (30%)	Speed	Delivery pace is natural, comfortable, and appropriate for the content.	Pace is generally appropriate, with only minor, infrequent hesitations.	Delivery is noticeably uneven; contains periods of rushed or overly slow speech.	Pace is consistently too fast or too slow, significantly detracting from delivery.
	Meaningless Filler	Virtually no use of distracting fillers (e.g., “um,” “ah”).	Minimal use of fillers; not overly distracting.	Noticeable and frequent use of fillers, which detract from the flow.	Excessive fillers consistently disrupt the fluency of the speech.
	Pause	Pauses are primarily used for rhetorical effect or to mark logical segments.	Pauses are mostly logical; some non-rhetorical hesitations may be present.	Pauses are often ill-placed, hesitant, or disrupt the phrasal flow.	Frequent, overly long, or disjointed pauses that break the flow of speech.
Expression (20%)	Completeness	The output is a complete, self-	The output is largely	Interpretation is noticeably	The segment is severely

Criterion	Index	10-9 (Excellent)	8-7 (Good)	6-5 (Adequate)	4-1 (Failing)
		contained segment matching the source in scope.	complete; a minor sentence or idea may be truncated.	fragmented or incomplete in parts.	truncated or abandoned prematurely.
	Authent icity	Language is idiomatic, natural, and conforms to target-language conventions. No translationese	Language is largely natural; slight influences from source-language structures may be present.	Language is frequently unnatural or awkward, with clear traces of translationese.	Language is predominantly non-idiomatic and difficult to follow.
Total (100%)					

Lastly, in designing and collecting the questionnaire, a data collection, analysis and management platform, Questionnaire Star, was needed. The Perception Questionnaire encompassed four dimensions: basic information of participants, self-evaluation, comparison of Cymo Note with traditional note-taking and evaluation of technology-assisted model.

5.4 Validity and Reliability

To ensure that all instruments met the required quality criteria, this study employed the Item Objective Congruence Index (IOC). Three experts were invited to review the questionnaire items and Interpreting Quality Framework, using a three-point scale (+1, 0, −1) to judge their consistency with the research objectives. This validation process was completed before the final version of the questionnaires was distributed. The reliability coefficients, represented by Cronbach's α, is 0.741, which is greater than 0.7, indicating high data reliability quality, which can be used for further analysis.

5.5 Data Analysis

In the data analysis section, the study employed various methods including frequency analysis, descriptive analysis and paired t-test. Frequency counts were used to map the distribution of categorical questionnaire responses (e.g., usage patterns, attitudes) and item-level selections, highlighting both common categories and infrequent responses. For the analysis of pre-test and post-test scores, descriptive statistics were calculated to summarize central tendency and variability for the three-performance metrics: accuracy, fluency, and expression. Subsequently, inferential analysis was conducted using paired-samples t-tests to determine the statistical significance of score differences before and after the intervention. The validity of employing a parametric test with a small sample was a considered factor. While the Shapiro-Wilk test indicated no significant departure from normality for the score distributions, it is acknowledged that normality tests can be underpowered with small sample sizes. However, the paired t-test is generally considered robust to deviations from normality, particularly when the data is derived from a homogenous group and the sample, though small, does not show extreme skewness (Glass, Peckham, & Sanders, 1972). Furthermore, the use of difference scores in a paired design and the clear, consistent direction of change observed across all participants support the appropriateness of this statistical approach for this preliminary investigation. For all instances where the t-test revealed a statistically significant effect, Cohen's d was

calculated and reported to provide a standardized measure of the effect size, thus indicating the practical significance of the findings.

Together, the descriptive and frequency analyses provide a contextual foundation that reinforces the inferential results from the paired comparisons, offering a multi-faceted interpretation of the data.

6.Research Findings

6.1 Findings for Research Question 1

The pre and post-test were completed by the five participants and statistical data were collected to answer the first research question. Each participant received two sets of scores: one derived from interpreting without the aid of Cymo Note, and the other based on performance using the tool. These results were evaluated comparatively across four dimensions: overall score, accuracy, fluency, and expression.

Prior to conducting in-depth statistical analysis, tests for normality were implemented to verify whether the overall scores and the individual metrics, accuracy, fluency, and expression, followed a normal distribution. Given that the sample size was below 50, the Shapiro-Wilk (S-W) test was selected as the appropriate method for assessing distributional characteristics.

Table 2: Normality Test of Pre and Post-tests

Item		Mean	S.D.	Skewness	Kurtosis	Shapiro-Wilk	
						W	p Value
Total score	Pre	49.400	6.025	-0.535	-1.284	0.907	0.451
	Post	57.800	5.310	-0.582	0.322	0.980	0.932
Accuracy	Pre	26.000	2.915	0.000	0.893	0.989	0.977
	Post	30.800	2.950	-1.235	2.533	0.888	0.346
Fluency	Pre	15.000	2.121	0.524	-0.963	0.910	0.468
	Post	17.000	1.581	0.000	-1.200	0.987	0.967
Expression	Pre	8.400	1.673	-0.512	-0.612	0.881	0.314
	Post	10.000	1.581	0.000	-1.200	0.987	0.967

* $p < 0.05$ ** $p < 0.01$

In the normality test, Accuracy, Fluency, Expression and Total in both tests show no significance ($p > 0.05$), indicating acceptance of the null hypothesis (null hypothesis: data follows a normal distribution), meaning that Accuracy, Fluency, Expression and Total has normality characteristics and can be tested using the *t*-test.

Table 3: Descriptive Statistics--Results of Pre and Post-test

Item	Min.	Max.	Mean	S.D.	Median
Total-Pre	41.000	55.000	49.400	6.025	50.000
Total-Post	50.000	64.000	57.800	5.310	58.000
Accuracy-Pre	22.000	30.000	26.000	2.915	26.000

Item	Min.	Max.	Mean	S.D.	Median
Accuracy-Post	26.000	34.000	30.800	2.950	31.000
Fluency-Pre	13.000	18.000	15.000	2.121	15.000
Fluency-Post	15.000	19.000	17.000	1.581	17.000
Expression-Pre	6.000	10.000	8.400	1.673	8.000
Expression-Post	8.000	12.000	10.000	1.581	10.000

The results indicate a clear improvement in students' interpreting performance following the intervention. The mean total score increased from 49.40 in the pre-test to 57.80 in the post-test, suggesting a notable enhancement in overall proficiency. This upward shift was accompanied by a narrower score range and reduced standard deviation, pointing to greater consistency among participants. In terms of accuracy, the average score rose from 26.00 to 30.80, reflecting stronger content fidelity and more precise message transfer. Fluency also showed improvement, with the mean increasing from 15.00 to 17.00 and a reduction in score variability, indicating smoother and more stable delivery. Expression scores followed a similar trend, rising from 8.40 to 10.00, which suggests clearer phrasing and more natural language use. Taken together, these findings support the effectiveness of Cymo Note in enhancing key dimensions of consecutive interpreting performance.

Table 4: Results of Paired t-Test

Paire	Item	Paired (Mean ± S.D.)		Mean Difference	*t*	*p* Value	Cohen's *d*
		Pre	Post				
Pairing 1	Total Score	49.40 ± 6.02	57.80 ± 5.31	-8.40	-12.385	0.000**	5.539
Pairing 2	Accuracy	26.00 ± 2.92	30.80 ± 2.95	-4.80	-9.798	0.001**	4.382
Pairing 3	Fluency	15.00 ± 2.12	17.00 ± 1.58	-2.00	-4.472	0.011*	2.000
Pairing 4	Expression	8.40 ± 1.67	10.00 ± 1.58	-1.60	-6.532	0.003**	2.921

* $p < 0.05$ ** $p < 0.01$

From the Table 4: Results of Paired t-Test, it can be seen that the overall total score rose from M = 49.40 (SD = 6.02) to M = 57.80 (SD = 5.31), d = 5.54, reflecting a very large effect. indicating a statistically and practically substantial improvement. This large effect suggests that, in the aggregate, the tool provided a meaningful boost to performance quality across the assessed dimensions. Dimension-specific results showed that accuracy exhibited the largest gain, rising from M = 26.00 (SD = 2.92) to M = 30.80 (SD = 2.95), d = 4.38. The strength of this effect supports the interpretation that Cymo Note's real-time transcription and annotation likely helped participants capture and reproduce source content more faithfully. Fluency improved from M = 15.00 (SD = 2.12) to M = 17.00 (SD = 1.58), suggesting smoother delivery and fewer hesitations when cognitive demands were partially offset. Expression scores increased from M = 8.40 (SD = 1.67) to M = 10.00 (SD = 1.58), d = 2.92, reflecting more natural phrasing and stylistic polish in the target language.

All improvements were statistically significant ($p < .05$) and accompanied by large to extremely large effect sizes, indicating that these differences are unlikely to have arisen

by chance and hold practical relevance for interpreter training. The consistent upward trend across all dimensions, coupled with very strong effect sizes, suggests that Cymo Note not only enhanced individual aspects of interpreting but also delivered a robust, comprehensive improvement in overall performance quality for this small cohort.

Table 5: Descriptive Statistics—Details in Accuracy, Fluency and Expression

Item	Index	Mean-Pre	Mean-Post	Changes
Accuracy	Information	3.800	5.200	+1.400
	Figures	5.000	6.000	+1.000
	Logic	4.000	5.400	+1.400
	Pronunciation	10.000	10.000	0
	Terminology	4.000	5.000	+1.000
Fluency	Speed	5.600	6.600	+1.000
	Meaningless Fillers	5.200	5.400	+0.200
	Pause	4.200	5.000	+0.800
Expression	Completeness	4.200	5.200	+1.000
	Authenticity	4.200	4.800	+0.600

The descriptive statistics in Table 5: Descriptive Statistics—Details in Accuracy, Fluency and Expression provide a detailed picture of how performance changed in specific aspects of accuracy, fluency, and expression between the pre- and post-test conditions.

Within the accuracy category, scores improved in four of the five sub-items. Gains of 1.40 were seen for both information and logic, indicating clearer content retention and more coherent message structure when Cymo Note was used. Figures and terminology also rose by 1.00 each, reflecting better handling of numerical details and specialized vocabulary. Pronunciation remained constant at its maximum score across both tests, suggesting it was already a strong area for all participants and unaffected by the intervention because it was English to Chinese interpreting and all participants were Chinese who had no pronunciation problem.

For fluency, all three indicators registered improvements, although to differing extents. Speed increased by 1.00, pointing to a more confident delivery pace. Pauses decreased (reflected in a +0.80 gain), which may signal smoother continuity. The smallest change was in meaningless fillers, which rose by only 0.20, suggesting relatively modest progress in reducing hesitation markers.

In the expression dimension, both elements improved. Completeness gained 1.00, meaning that more target-language output contained all essential ideas from the source. Authenticity improved by 0.60, showing somewhat more natural and idiomatic phrasing, though the change here was less pronounced than in completeness.

Overall, the pattern shows consistent positive movement across nearly all micro-skills, with the strongest advances in conveying information accurately and maintaining logical structure, and more moderate gains in expressive authenticity and filler reduction. This suggests that the intervention's greatest impact was on the precision and organization of content, alongside modest but noteworthy fluency and expression benefits.
6.2 Findings for Research Question 2

The analysis of student perceptions, drawn from a post-intervention questionnaire featuring both Likert-scale items and open-ended questions, revealed a nuanced view of Cymo Note's integration into CI training. The quantitative data pointed to specific trends, while the qualitative responses provided depth and context to these patterns, illuminating the reasons behind the scores. Depending on the Likert Measurement, the participants freely showed their opinions on each item by choosing one appropriate scale among five points (namely 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) in the matter of how strongly they agree or disagree with the given items. Frequency data and descriptive data were collected. Results of comparison of Cymo Note with traditional note-taking and the evaluation of Cymo Note-integrated training combined with open-ended questions can reveal students' perceptions. The quantitative data pointed to specific trends, while the qualitative responses provided depth and context to these patterns, illuminating the reasons behind the scores.

Table 6: Descriptive Statistics—Comparison of Cymo Note with Traditional Note-taking

Item	n	Min	Max	Mean	S.D.	Median
Cymo Note has compensated for my deficiencies in listening and comprehension:	5	3.000	5.000	4.000	1.000	4.000
Cymo Note reduces my burden of note-taking.	5	3.000	5.000	4.000	0.707	4.000
Cymo Note improves the accuracy of my interpreting compared to traditional notes.	5	3.000	4.000	3.400	0.548	3.000
Cymo Note enhances the fluency of my interpreting compared to traditional note-taking.	5	2.000	4.000	2.800	0.837	3.000
Cymo Note provides clearer notes than traditional methods.	5	2.000	4.000	3.600	0.894	4.000
With Cymo Note, I can sustain longer periods of consecutive interpretation than with traditional way.	5	2.000	4.000	3.000	0.707	3.000
I have to spend more effort operating Cymo Note than traditional note-taking.	5	2.000	4.000	3.200	0.837	3.000

Based on the Table 6: Descriptive Statistics—Comparison of Cymo Note with Traditional Note-taking, most respondents reported positive experiences with the tool. They agreed that Cymo Note helped compensate for limitations in listening and comprehension and reduced the burden of note-taking. This statistical finding was consistently echoed in qualitative comments, which highlighted the tool's role as a reliable cognitive scaffold. One student noted, "With the transcript, I didn't have to panic about missing a keyword. I could listen for the overall meaning instead of just frantically writing." Several participants felt it enhanced their accuracy compared to traditional methods, though views on its effect on fluency were more moderate. Another explained that "It definitely improved my accuracy, especially with numbers and specific names. I knew I could always glance down and find the exact term, so I wasn't guessing." Ratings for the clarity of notes were relatively high, suggesting that the structured, legible transcripts offered a tangible advantage over handwritten notes. However, sustaining longer interpreting stretches with Cymo Note received only a neutral average score, indicating that stamina in interpretation may be influenced by factors beyond note-taking support.

While most acknowledged benefits such as improved detail recall, reduced memory pressure, and better handling of names and numbers, a portion noted that operating the software required more effort than writing notes by hand. It can also be testified by one students' response "I have to spend more effort operating Cymo Note than traditional note-taking", "There' a new mental step that is deciding whether to look at the screen or listen to the speaker." and "My notes were clearer, but my delivery was sometimes less smooth because I was managing the software." This hints at a small but meaningful learning curve when integrating the tool into live interpreting practice.

Table 7: Descriptive Statistics—Participants' Feedback

Item	n	Min	Max	Mean	S.D.	Median
Importance of integrating technology-assisted interpreting knowledge into CI course.	5	3.000	5.000	4.000	1.000	4.000
Evaluation of the Cymo Note-integrated training.	5	3.000	5.000	4.200	0.837	4.000

Student feedback extended beyond the tool's immediate utility to its broader role in interpreter training. As shown in Table 7: Descriptive Statistics—Participants' Feedback, participants assigned high ratings to both the importance of integrating technology-assisted interpreting knowledge into the curriculum (M=4.00, SD=1.00) and their evaluation of the specific Cymo Note-integrated training they received (M=4.20, SD=0.84). These consistently high scores indicate that students did not view Cymo Note as an isolated gadget, but as a legitimate and valuable component of their professional education.

Qualitative comments substantiated this quantitative data, revealing a perception of the tool as a bridge to professional practice. One student remarked, "Learning with this software feels more aligned with how interpreting might be done in real-world settings now." This sentiment highlights a perception that technological literacy is an integral skill. Another participant focused on the pedagogical benefit, noting, "It should be a part of the course because it forces you to organize your notes differently and more logically, which is a good skill even without the tool."

This feedback collectively suggests that students perceive the integration of tools like Cymo Note as a critical and welcome modernization of the curriculum. They valued the training not only for its immediate functional support but also for its role in preparing them with the technological competencies and adaptive strategies required for a contemporary interpreting career.

Discussion and Conclusion

7.1 Discussion

This pilot study sought to empirically evaluate the impact of the note-taking assistance tool, Cymo Note, on the consecutive interpreting performance and perceptions of Chinese undergraduate students. The findings indicate that the integration of this specific tool was associated with notable improvements, which can be coherently explained through the cognitive and pedagogical theories established in this paper's framework.

The significant gains in interpreting accuracy, evidenced by the large effect sizes from pre-test to post-test, provide strong support for the cognitive principles underpinning

this research. This outcome aligns directly with Gile's (2009) Effort Models. The automated transcript generated by Cymo Note appears to have reduced the cognitive resources dedicated to the "Note-Taking Effort." As one student noted, the tool prevented the "panic about missing a keyword," suggesting that attentional capacity was freed and could be reallocated to the "Listening and Analysis Effort," thereby leading to a more faithful rendition of the source message. The tool seems to have mitigated the extraneous cognitive load associated with the mechanics of manual notation, allowing working memory to focus more effectively on the intrinsic load of comprehension and reformulation. This finding resonates with prior research on technology-assisted interpreting, such as Fantinuoli's (2018) observation that technological support can drastically reduce errors on specific information.

The student perception data offers a crucial dimension, best understood through the TPACK framework (Baran et al., 2011). Participants overwhelmingly reported that Cymo Note reduced their note-taking burden and compensated for listening deficiencies. This indicates a successful alignment between the TK of the tool and the CK of consecutive interpreting's core cognitive challenges. However, the perceived "operational effort" highlights a critical point of friction. The reported challenge of dividing attention between the screen and the speaker underscores that the PK, how to effectively train students to use the tool strategically, is as vital as the tool itself. This suggests that the tool's efficacy is contingent upon thoughtful instructional design that explicitly addresses its integration into the interpreting process, a concern also noted in studies of other computer-assisted interpreting (CAI) tools (Andrew & Tianyun, 2023).

The more moderate, yet statistically significant, improvement in fluency presents a nuanced picture. While a reduction in note-taking effort should theoretically free resources for smoother production, the qualitative data reveal a countervailing factor: the initial cognitive cost of managing the software interface. This suggests a transition period where the benefit of a reduced note-taking load is partially offset by the new demand of tool operation. This finding refines the cognitive load argument, indicating that the net benefit on delivery fluency may increase as students develop greater familiarity and more efficient strategies, a developmental process that the TPACK framework is designed to facilitate.
The statistical evidence confirms that Cymo Note significantly enhanced Chinese interpreting students' performance across all measured dimensions. The tool demonstrably supports the core cognitive process of accurate meaning transfer by offloading a key effort, as predicted by Gile's and Sweller's models. Its ultimate effectiveness, however, is mediated by the pedagogical support surrounding its use.

7.2 Implications

The primary pedagogical implication is that tools like Cymo Note should be viewed not as a replacement for foundational skills, but as a targeted cognitive scaffold. To implement this effectively, instructor training should extend beyond operational fluency with the software to include pedagogical content knowledge (PCK) for its integration. Instructors must be equipped to teach students how to use the tool strategically to mitigate the observed challenge of divided attention. Furthermore, assessment practices could be refined to account for this technological mediation. While traditional metrics for accuracy and fluency remain paramount, evaluators should be attentive to the specific types of errors

that diminish (e.g., factual omissions) and those that may initially arise (e.g., disfluencies from interface management) as students adapt to the tool.

For students, this study underscores that proficiency in CI now involves negotiating cognitive resources between the auditory source speech and a visual digital aid. Success with a tool like Cymo Note requires the development of strategic digital literacy. This entails building the mental flexibility to dynamically allocate attention and the metacognitive awareness to use the transcript as a supportive backup rather than a crutch. Training modules should therefore explicitly address this cognitive transition, preparing students for the initial performance anxiety associated with the tool's operational load and guiding them toward using it to enhance, rather than hinder, their delivery fluency.

7.3 Limitations

While this study offers initial insights into the use of Cymo Note, its findings must be considered in light of several methodological constraints.

The most significant limitation is the small sample size (N=5) and the homogeneity of the participant pool, which consisted exclusively of senior-year translation majors from a single university. Such constraints reduce the likelihood that the conclusions can be extended to the broader population of Chinese university students whose majors are outside the field of Translation. Secondly, the study investigated a single technological tool, Cymo Note. While its features provided a valuable case study for a note-taking assistance tool, the findings cannot be extrapolated to the broader ecosystem of computer-assisted interpreting tools, which possess diverse functionalities. Outcomes may vary considerably when different technologies are applied in differing instructional or operational contexts. Lastly, in examining the data, certain categories and assessment formats inevitably involved subjective judgment. It is possible that researchers with different backgrounds or methodological preferences might apply alternative criteria and derive distinct interpretations from the same set of materials. Future studies would benefit from incorporating multiple, blinded assessors to enhance the objectivity of the performance analysis.

7.4 Conclusion

This pilot study set out to evaluate the specific impact of the note-taking assistance tool, Cymo Note, on the CI performance and learning perceptions of a defined group of undergraduate translation students. The empirical findings from this limited context indicate that the tool holds notable pedagogical potential. Quantitative analysis confirmed that its use was associated with statistically significant improvements in students' interpreting performance, most markedly in the area of accuracy, with substantial effect sizes. Qualitative data revealed that this improvement was likely facilitated by the tool's capacity to reduce the cognitive burden of manual note-taking, acting as a reliable transcriptive backup that allowed students to focus more consistently on the meaning of the source speech.

Student perceptions further refined this understanding. While they valued the tool for the cognitive support and confidence it provided, they also consistently reported that the operational effort required to use it introduced a new challenge, potentially impacting

the fluency of their delivery. This underscores that the benefits of such technology are not automatic but are mediated by the user's ability to integrate it seamlessly into their interpreting process.

Consequently, the primary implication of this study is not a broad endorsement of a technology-assisted model, but a demonstration that Cymo Note can function as an effective pedagogical scaffold within a specific interpreter training curriculum. Its value appears to lie in helping students manage cognitive load, thereby creating conditions where they can more successfully practice and internalize the core skill of accurate meaning transfer.

The clear limitations of this study, including its small sample size and focus on a single tool, preclude definitive generalizations. Future research should involve larger, more diverse participant groups and longitudinal designs to investigate the long-term retention of skills developed with tool support. Comparative studies of different note-taking technologies would also help to identify which specific features most effectively support student interpreters at different stages of their training. Ultimately, this pilot study suggests that Cymo Note is a promising tool worthy of further investigation, not as a replacement for foundational skills, but as a strategic aid that can be judiciously integrated to support specific learning objectives in the interpreting classroom.

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