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Integrating CAI Tools & ASR in the Interpreting Classroom: A Proposal for Lesson Plans Using InterpretBank

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Abstract: Technology advances have brought some important changes to interpreting practice, such as making distance interpreting possible and creating useful computer-assisted interpreting (CAI) tools. Tools such as InterpretBank that include features like terminology building and automatic speech recognition (ASR) are advantageous to interpreters in various settings. This study aims to present an overview of the CAI tools and their development, analyze the current market demand for technology-related skills, and integrate CAI and ASR tools with interpreter education. To analyze technology requirements in the job market of interpreting, we collected twenty-four job advertisements and examined employers' demand for the aspects of distance interpreting and other technology-related requirements. This study then proposes a lesson plan that integrates a CAI tool (InterpretBank) into an interpreting course for MA-level students. The lesson plan contains three modules: the first one introduces the basic concepts of CAI tools and interpreting remotely; the second module focuses on the terminology-building feature of CAI tools, especially in creating multilingual glossaries and extracting terminology in the preparation stage of interpreting; the third module highlights ASR feature of InterpretBank.

Keywords: CAI tools, interpreting, InterpretBank, terminology, speech recognition.

1. Introduction

The past decades have witnessed sweeping changes brought by technology in almost every industry. Computer-assisted translation (CAT) tools, the parallel of computer-assisted interpreting (CAI) tools, have revolutionized the translation practice by simplifying the translation process and enhancing the efficiency of translation. The development of CAI tools also made some great contributions to the interpreting industry. New devices, applications, and software are designed and used in interpreting practice, making interpreting more accessible, collaborative, and efficient. Additionally, the COVID-19 pandemic triggered a trend away from traditional face-to-face interpreting toward remote interpreting, forcing interpreters to adapt to the technology-integrated workflows. In the post-pandemic era, remote interpreting remains prevalent, as virtual conferences and meetings continue to be widely used in all kinds of contexts. Therefore, it is essential to integrate technology and CAI tools into interpreter training and education, preparing students to overcome the potential challenges of the post-COVID era.

This paper focuses on this trend and proposes a lesson plan integrated with CAI tools. By combing through some of the important research on CAI (including ASR) and interpreter training, this study aims to present an overview of the CAI tools and their development. It also aims to provide a snapshot of the current market demand for technology-related skills, especially for CAI tools to show the necessity of a technology-aided interpreting class.

2. Main Concepts and Previous Studies

2.1 Distance Interpreting

Distance interpreting has two established modalities: telephone/audio-mediated interpreting and video-mediated interpreting (Braun 2019). The former includes telephone/audio-conference interpreting and audio remote interpreting, and the latter includes videoconference interpreting and video remote interpreting. Braun (2019) also differentiates various modes of distance interpreting by participant distribution. From this perspective, distance interpreting includes teleconference interpreting, during which clients are located at two or more sites, and remote interpreting, during which clients participate from one site and the interpreter, from a separate site.

The primary form of distance interpreting is telephone interpreting. In 1973, an Emergency Telephone interpreter service was set up in Australia, marking one of the first systematic implementations of distance interpreting (Pöchhacker, 2022). Video-mediated interpreting appeared in the 1990s and was based on the Integrated Services Digital Network, which had led to problems with audiovisual quality due to its low bandwidth. This issue, according to Braun (2019), was later solved when broadband internet became widely available. The attitude of interpreters toward distance interpreting also became more positive as the audiovisual quality improved (Braun, 2019). Some professional interpreters find that video-mediated interpreting services are more accessible, cost-effective, and offer the option to work from home, compared to traditional face-to-face interpreting (Koller & Pöchhacker, 2018). Distance interpreting gained popularity in recent years. Due to the COVID-19 pandemic, many conferences were cancelled, postponed, or held remotely, impacting the demand for in-person interpreting and making distance interpreting the optimal solution (Prandi, 2023). For instance, since the pandemic began, there has been an increased demand for remote simultaneous interpreting (RSI) from companies like KUDO and VoiceBoxer, as well as for video-remote interpreting (VRI) and over-the-phone interpreting (OPI) in sectors such as call centers, legal and court services, and onsite providers. This surge in demand for remote interpreting services during the pandemic prompted some Virtual Interpreting Technology (VIT) providers to hire more interpreters and allocate additional resources to train new interpreters. For example, KUDO doubled its staff within a month and significantly increased its number of certified interpreters, adding at least 100 per day during the pandemic (Nimdzi, n.d.).

2.2 Computer-Assisted Interpreting Tools

Technology has been used in the professional interpreting practice since the 1920s. It allowed interpreting activities to go on regardless of space restrictions (Baigorri-Jalón,1999) and triggered a rise in simultaneous interpreting (Fantinuoli, 2018). Especially, the wired systems for speech transmission, modified telephones, and telephone exchanges, enabled the development of simultaneous conference interpreting (International Association of Conference Interpreters, n.d.). In addition, technological advancements have led to the development of programs and applications specifically designed to support and enhance interpreter performance across the pre-assignment, delivery, and post-assignment stages (Pielmeier, 2018). These tools are CAI tools, with features including, but not limited to, knowledge acquisition and management, briefing, terminology management and access, as well as quality assessment and reporting (Fantinuoli, 2023).

Before the COVID-19 pandemic, interpreting appeared to be less affected by information and communication technology compared to translation (Fantinuoli, 2017a, 2018; Prandi 2017; Horváth, 2022). Nonetheless, significant changes in the interpreting industry were introduced through technological advancements. According to Braun (2019), interpreting technologies can be categorized into three types: technology-mediated interpreting, technology-supported interpreting, and technology-generated interpreting; technologies have been developed to deliver interpreting services, promote distance interpreting, enhance preparation, performance, and workflow, and even to generate machine interpreting, which is also known as automatic speech translation. As speech transmission technology marks the first technology breakthrough in the interpreting industry, the Internet was the site of another breakthrough in the 1990s (Faninuoli, 2017a). The Internet, especially its search engines, makes knowledge accessible to interpreters with simple clicks of a mouse. Gile (2009, p. 129) suggests, in the three stages of "ad hoc knowledge acquisition" (namely advance preparation, last minute preparation, and in-conference knowledge acquisition), that finding needed information on the Internet is a part of advance preparation. Interpreters can use the Internet to tackle unfamiliar topics and build corpora for terminology in interpreting assignments. The Internet also provided a foundation for enhancing the accessibility of interpreting services. This leads to what Fantinuoli (2018) called the technological turn of interpreting or the third technological breakthrough, in which CAI tools, along with remote interpreting and machine interpreting, play a central role. He states that this third breakthrough would bring radical changes to the interpreting profession, leading to "a transformation of the interpreting ecosystem" and "impact on many socio-economic aspects related to the profession" (p.3). The COVID-19 pandemic seems to have accelerated this transformation process; distance interpreting technologies, in particular, made vital interpreting services provision possible during lockdowns (Prandi, 2023). Now as artificial intelligence (AI) such as ChatGPT is becoming a hot topic, the potential of AI-driven technology assisting the interpreting workflow or even its potential to replace the human interpreter requires further investigation.

The practical application of CAI tools in the interpreting profession has been reviewed by several researchers throughout the last few decades. Berber-Irabien (2010) introduces some CAI tools and other technological resources used among conference interpreters for training purposes, including software like Black Box, Divace sound files, Elice (Enhanced Language Instruction Center), Interpretations, and Interpr-It, databases like IRIS database and Marius, teaching and e-learning platforms like Melissi Digital Classroom, Claroline Virtual Campus, Entorno Virtual de Aprendizaje Interactive (Virtual Interactive Learning Environment), and Moodle. The author also summarizes the technological resources reportedly used by interpreters but not designed specifically for conference interpreting, including the audio recording and editing software Audacity, machine translation software Language Weaver, multimodal corpora such as The British National Corpus Online, MEDATA, and SCIC's Speech Repository, and some other general technologies, such as video and audio players and public and private networks. Rütten (2017) provides an analysis of the pros and cons of various CAI tools, including Interplex, Lookup, Terminus, Glossarmanager, InterpretBank, Interpreters' Help, Intragloss, and Glossary Assistant, aiding interpreters in selecting the most suitable tools for their needs. Key features of these tools include "sorting, filtering, and searching," "workflow support," "sharing and online collaboration," "mobile use," and "generic terminology management systems" (pp. 99-102). Prandi (2017) surveys the application of technological resources in conference interpreter training and finds that InterpretBank, Interplex, and Interpreter's Help are the three most popular CAI tools in conference interpreter training, and other resources such as online databases, corpora, and videoconferencing software are also integrated into conference interpreter training. Fantinuoli (2016a) compares the first and second-generation CAI tools and finds that first-generation tools such as Interplex are "designed to manage multilingual glossaries in an interpreter-friendly manner" and second-generation tools such as InterpretBank "offer advanced functionalities that go beyond basic terminology management" (p.44). Costa et al. (2014) summarize CAI tools from the following aspects: glossary-building, note-taking, voice recording, and interpreter training. These authors point out that the available tools and applications are still insufficient, and it is necessary to develop technologies to automate the interpreting process, enhance interpreter's efficiency in assignments, and reduce laborious activities. In 2017, Shanghai International Studies University (SISU) and iFLYTEK, an intelligent speech and AI company, established the "SISU iFLYTEK Lab," aimed at developing machines to assist interpreting trainees and professionals learn and complete interpreting tasks. According to SISU iFLYTEK Lab (n.d.), this joint lab developed software named 口译助手 (interpreter assistant). During its first trial, SISU and iFLYTEK conducted 54 rounds of experiments with 54 students and collected nearly 100 product improvement suggestions. They stated that their software can help students enhance the completeness of their interpretation and reduce the working pressure during interpreting (SISU iFLYTEK Lab, n.d.).

The application of technology, particularly AI, in interpreting and other practices has raised various ethical concerns, including but not limited to algorithmic and data bias, confidentiality and privacy issues, and questions about how professional ethics or code of conduct should address these challenges. For instance, Feng et al. (2021) find algorithmic bias in their investigation of the objectivity of an advanced ASR system by analyzing how error rates are influenced by factors such as age, gender, accent, race, and speech impairment. They point out that the ASR systems based on deep neural networks are usually trained on standard forms of speech, thus causing algorithmic bias towards articulation that is different from the standard (Feng et al., 2021). Apart from ASR, AI systems in general also triggered ethical concerns. One of the major controversies of AI is also algorithmic bias; the training sets for AI are not always objective and representative, which causes AI to replicate human biases (Green, 2020; Bird et al., 2020). Besides the algorithm issues, the idea of processing, storing, sharing interpreting data on cloud systems in CAI tools is triggering questions on data confidentiality, privacy and ownership, as well as data security and protection (Fantinuoli, 2023; Horváth, 2022). Horváth (2022) emphasizes that CAI tools need to clarify their methods for protecting data subjects' rights, including providing details on obtaining consent to process data from speakers in an interpreting session. From the interpreter's perspective, a professional interpreter needs to be aware of and observe ethical principles of interpreting, such as confidentiality, neutrality, and accuracy (see, for example, Kermit, 2007). Although the code of ethics that interpreters follow can vary based on context, interpreting techniques, regional norms, etc., interpreters must be mindful of the potential challenges technology poses to their ethical standards, particularly when AI interpreting and human interpreting are combined. Despite the concerns and controversies on technology and CAI tools, Berber-Irabien (2010) finds that interpreting trainers recognize the necessity of supporting trainees to learn to use the technological tools. Some CAI tools like Black Box and its newer version Virtual Interpreting Environment (VIE) are also called computer-assisted interpreter training (CAIT) tools; they can help to interpret trainees store materials for review and practice, and even simulate a virtual conference center that is fully immersive (Sandrelli & Hawkins, 2006). In addition, Zhou (2019) analyzes the influence of CAI tools on interpreting performance. He finds that the terminology management tool in Interpretbank not only enhances the quality of terminology interpreting but also the overall performance of the interpreter.

2.3 Automatic Speech Recognition (ASR)

Speech recognition[1] or automatic speech recognition (ASR) is the process of converting human speech signals to a sequence of words by means of a computer program (Jurafsky & Martin, 2024; Bhardwaj et al., 2022). ASR has been proposed as a kind of technology to automate the querying system of CAI tools

[1] The term speech recognition is also called voice recognition, and in this paper, we use these two terms interchangeably.

(Desment et al., 2018; Fantinuoli, 2022). It is also worth noting that, with the technological advancements, ASR may offer an alternative technology-based method (i.e. the digital pen) which results in the possibility of changing the traditional process of consecutive interpreting, through note-taking with pen and paper (Orlando, 2014).

In addition, ASR has been used in many areas such as human-machine interface or for dictation purposes. In recent years, ASR technology has garnered more attention due to several key factors. One significant reason is the advancement of computational power, the availability of large datasets, and efficient neural learning algorithms, which have substantially improved the performance of ASR systems (Lu et al., 2020). According to Fantinuoli (2017c), new approaches, particularly Neural Networks and Deep Learning, have played a crucial role in enhancing the quality of ASR systems. Additionally, over the past decade, commercial interest in ASR has surged, with major players like Microsoft, Amazon, and Apple investing heavily in developing voice-activated products, such as Cortana, Alexa, and Siri (Fantinuoli, 2017c). Accordingly, ASR has an impact on interpreters and the interpreting process and this has been noted by some researchers who, according to Pöchhacker (2016), consider ASR as a technology "with considerable potential for changing the way interpreting is practiced" (p.188). To illustrate the process of implementing ASR in consecutive interpreting, for instance, interpreters may utilize the spoken: "to sight-translate the speech segment, with obvious advantages in terms of precision and completeness" (Fantinuoli, 2017c, p. 26). In terms of simultaneous interpreting, ASR is used to implement innovative aspects that seek to facilitate the process of typical "problem triggers" in interpretation like numbers, acronyms, and proper names. In addition, ASR can be utilized to query the glossary of the interpreter (Fantinuoli, 2017c, p. 26).

With this in mind, integrating this technology into the interpreting classroom is of great importance for training students with the ASR tools which can help them in their future careers. One of the advantages of integrating technology, particularly the ASR tool, in the classroom, is that it plays a role in advancing student-centered learning. This technology would be a fundamental tool for instructors due to its potentiality and flexibility. It provides students with real-time, customized information that supports their ability to interpret tasks efficiently and skillfully. So how can speech recognition tools be integrated into computer-assisted interpreting technology?

2.4 Speech Recognition and CAI Integration

Speech recognition, also known as speech-to-text or voice recognition, is a technology that allows speech to serve as the primary interface between humans and computers (National Center for Technology Innovation, n.d.). Here, we will consider that current speech recognition technology in CAI tools facilitates student learning and benefits their future development as interpreting professionals. For instance, major technology companies like Microsoft and Apple have already incorporated speech recognition features into their operating systems, creating new opportunities for instructors to incorporate these tools into their teaching practices.

Currently, speech recognition technology is gaining traction within the interpreting industry, with applications in sectors such as the military, medical, and legal fields. The increasing market demand for such technologies underscores the importance of familiarizing interpreting students with ASR tools, which are likely to play a preeminent role in the future of the profession. As noted by the National Center for Technology Innovation (n.d.), technology leaders predict that future human-computer interactions will predominantly rely on voice and touch, making it essential for students to receive training in their emerging technologies. However, for ASR tools to be effectively integrated into interpreters' workstations, certain criteria must be met. According to Fantinuoli (2017c), these tools must be speaker-independent, have a rapid response time, and accurately recognize specialized terminology. Additionally, CAI tools which support the use of such technologies, must overcome challenges related to handling morphological variants and offering ergonomic ways to present extracted information (Fantinuoli, 2017c, p. 26). These considerations are crucial to ensure that the tools can assist professional interpreters in their daily tasks, such as sorting terminological data, preparing for assignments, and sharing information with colleagues (Pastor & Fern, 2016; Fantinuoli, 2016a, 2017c; Prandi, 2020).

One of the primary advantages of CAI tools is their ability to assist interpreters in accessing multilingual terminology during simultaneous interpretation (SI). However, a key limitation is that interpreters must manually input terms into the system to query the database and retrieve relevant information (Fantinuoli, 2017c). This manual lookup process can be time-consuming and distracting, especially during high-pressure tasks like simultaneous interpretation, where fast information processing and focus are critical. Taking these factors into account, Fantinuoli (2017c) suggests that integrating an automatic lookup feature into CAI tools could significantly enhance interpreters' performance. With an automatic lookup system, interpreters would be able to access the required terminology without interrupting their workflow, thus reducing cognitive load and improving efficiency during the simultaneous interpretation of specialized texts (Fantinuoli, 2017c).

To illustrate the practical application of this integration, this paper will examine InterpretBank, a CAI tool that incorporates speech recognition features. InterpretBank was chosen for its innovative use of ASR to extract terminology during interpreting sessions, addressing many of the limitations discussed earlier. This tool is particularly notable for its user-friendly interface, accessibility, and comprehensive range of features. Moreover, InterpretBank offers a Campus License, allowing unlimited access for both students and instructors, and it can be installed on university computers as well as students' laptops. The following section will explore the specific functionalities of InterpretBank and highlight its potential to support interpreting education and professional development.

2.5 InterpretBank

InterpretBank was first created as a terminology tool for conference interpreters and for supporting them during the preparation of their assignment and interpreting process at the University of Mainz by Claudio Fantinuoli. The project started in 2014, and later, a company of the same name, InterpretBank, was formed in 2018. InterpretBank is a desktop application for Windows and macOS, and it can also be easily downloaded on mobile services. In addition, it has different versions, and the most up-to-date version is InterpretBank 9. According to Fantinuoli (2016a), InterpretBank is a CAI tool "developed to create assignment-related glossaries accessible in a booth-friendly way" and it consists of three interconnected modules, "designed to cope with a particular task of the interpreting workflow" (p.45). These modules are as follows: first, the Edit Module which is used for the multilingual glossaries' creation and management; second, the Memory Module used for the memorization of terminology; and third, the Conference Module used for terminology look-up during interpretation.

InterpretBank is a more suitable option for interpreters compared to Excel or Microsoft Word documents for creating glossaries. An important feature offered by InterpretBank is the lookup function which integrates state-of-the-art natural language processing tools, and it "implements progressive search, fuzzy search, stopwords exclusion and accent-insensitive search" (Fantinuoli & Prandi, 2018, p.167), which is shown in Figure1. These functionalities ensure that interpreters can access relevant terms quickly and accurately, even when dealing with specialized or domain-specific vocabulary. Fantinuoli and Prandi (2018) also indicate that InterpretBank, as illustrated in Figure 2, permits the integration of automatic speech recognition to diminish the cognitive load experienced by interpreters when they look up terminology during interpretation, a critical improvement given the fast-paced nature of simultaneous interpretation. An important benefit of InterpretBank is its document management function, which allows for automatic extraction and summarization of terminology. We believe that this tool would be helpful for interpreters as it extracts terms, from the interpreter's preparatory documents, automatically, without the need to look them up manually and this would increase the efficiency of their workflow.

By supporting the extraction of terminology from various file formats—formats such as Excel, Microsoft Word, PDF files, or websites—InterpretBank also accelerates the process of glossary creation. Moreover, it offers translation suggestions and automatic translation services through Generative AI, which can further assist interpreters in managing large amounts of terminology quickly.

Figure 1. Terminology Lookup Box

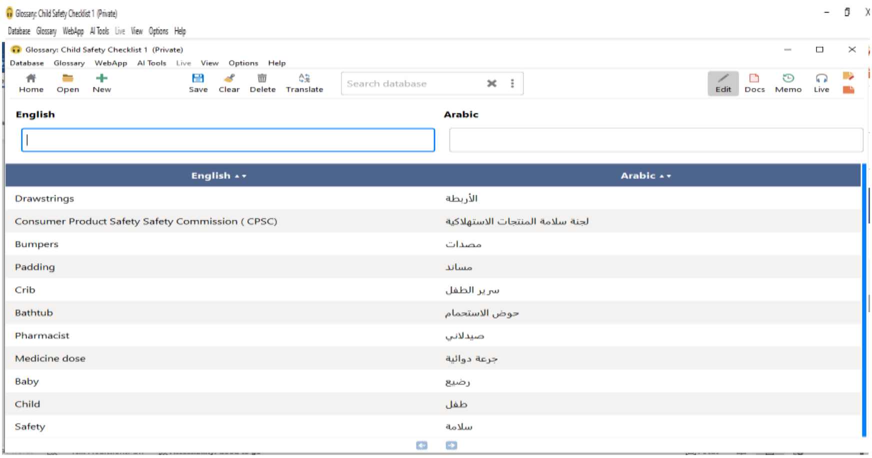

Figure 2. Glossary of English Terminologies and their Arabic Translation[2]

InterpretBank automatically provides the interpreter with a set of information after reading the transcription from an ASR system. This includes entries from the terminology database, numerals, and more. In addition, this tool is designed with

[2] This glossary is generated in InterpretBank using medical texts retrieved from https://www.healthinfotranslations.org/language/arabic/392138/topic/pediatrics/756946/

an open interface between the CAI tool and the ASR system. According to Fantinuoli & Prandi (2018), the "specially designed open structure allows users to choose the ASR engine with the best quality output for the source language, domain, and operative system without having to change or adapt the CAI interface" (p.167). So, how can this tool be used in the interpreting booth? The required acoustic input signal in the system is similar to the one that interpreters receive in their headset and "since most standard booth consoles have more than one audio output for headphones, one of these can be connected to the audio input of the computer equipped with the ASR-CAI tool" (p.167). Moreover, a headphone splitter may be utilized to provide an audio output to the interpreter's headphones and the computer audio card in case a second audio output is not available (Fantinuoli & Prandi, 2018).

The working process might be classified into two main stages; the tool reads the provided transcription first and pre-processes the text. Then, it queries the terminological database and, from the text flow, it identifies the entities "visualizing the results in an interpreter-tailored graphical user interface," in addition, this tool requires the transcription to be provided by the ASR system in pieces of text because the algorithms are triggered anytime when a new text is automatically provided by the ASR (Fantinuoli & Prandi, 2018, p.167). Since speech recognition tools support interpreters, InterpretBank shows how voice recognition, with pre-prepared glossaries, plays a crucial role in helping simultaneous interpreters where the software recognizes terms spoken and extracts them from the glossary. Then, it demonstrates the translation from the glossary on the screen. Thus, we believe that this would be a beneficial tool for interpreter training.

3. Technology and the Interpreting Industry

Job advertisements can be an important data source for describing the labor market from a practical perspective, as they directly show the requirements of the employers (Wang & Li, 2020; Kelly, 2005). This section examines the qualifications employers seek in interpreters to provide a snapshot of the current market demand for technology-related skills in interpreting, with a focus on the U.S. job market, as the lesson plans are designed for M.A. programs in the U.S.

The objective of this brief investigation is to identify what U.S. employers seek in terms of technology skills for interpreting positions. Therefore, this study examines two main aspects: first, the modality (online or face-to-face), as distance interpreting requires audio or video-mediated technology; and second, descriptions of technology-related requirements, such as digital literacy or the ability to use CAI tools. This study presumes that most job advertisements require interpreters to be capable of both face-to-face and remote interpreting and to utilize technological tools to assist their work.

We collected twenty-four job advertisements from LinkedIn, the world's largest professional network and media platform widely used in the U.S., to ensure a relatively representative sample. The search focused on full-time positions specifically titled "interpreter" located in the U.S., thereby excluding unrelated professions and positions in other regions. Aspects such as interpreting techniques, contexts, language pairs, company size, and salaries were not specifically examined. Positions involving both interpreting and translation were included, but only the interpreting components were analyzed to keep the dataset focused solely on interpreting. In order to look at current job market demand and to maintain a manageable dataset, we collected the first twenty-four job advertisements displayed in the search results, sorted by recency. Data collection occurred on March 15th and March 16th, 2024.

Table 1. Overview of the Collected Job Advertisements

Ad Number	Modality (Distance or face-to-face interpreting)	Technology-related requirements
1	Face-to-face	Basic computer skills
2	Both	Interpret via phone
3	Face-to-face	Basic computer skills
4	Both	Interpret via phone Basic computer skills
5	Distance	Interpret via phone
6	Both	Basic computer skills
7	Both	Basic computer skills
8	Both	Interpret via phone
9	Face-to-face	Basic computer skills
10	Unclear	Unclear
11	Both	Interpret via phone
12	Both	Interpret via phone Basic computer skills

Ad Number	Modality (Distance or face-to-face interpreting)	Technology-related requirements
13	Both	Interpret via phone
14	Face-to-face	Basic computer skills
15	Both	Interpret via phone and video Basic computer skills Terminology management
16	Both	Interpret via phone Basic computer skills
17	Face-to-face	Basic computer skills Translation tools and machine translation
18	Distance	Interpret via phone and video
19	Distance	Interpret via phone and video Basic computer skills Terminology management
20	Face-to-face	Unclear
21	Both	Basic computer skills
22	Both	Interpret via video Basic computer skills
23	Both	Interpret via phone and video
24	Face-to-face	Basic computer skills

Table 1 presents basic information about the job advertisements, including modality and technology-related requirements. Job advertisements lacking clear details on these aspects are labelled as “unclear” in Table 1. The data indicates a varied approach to interpreting modalities, including face-to-face, distance, and mixed modalities. A large portion of advertisements (13 out of 24) seek interpreters who can work in both face-to-face and remote settings, while 7 out of 24 specify face-to-face interpreting only, and 3 out of 24 are limited to distance interpreting. One advertisement does not specify any modality. These results suggest that face-to-face interpreting remains the predominant mode; however, the high demand for interpreters who can transition between in-person and remote modalities reflects the growing importance of distance interpreting as a valuable skill to employers.

Figure 3. Technology-related Requirements in Collected Job Advertisements

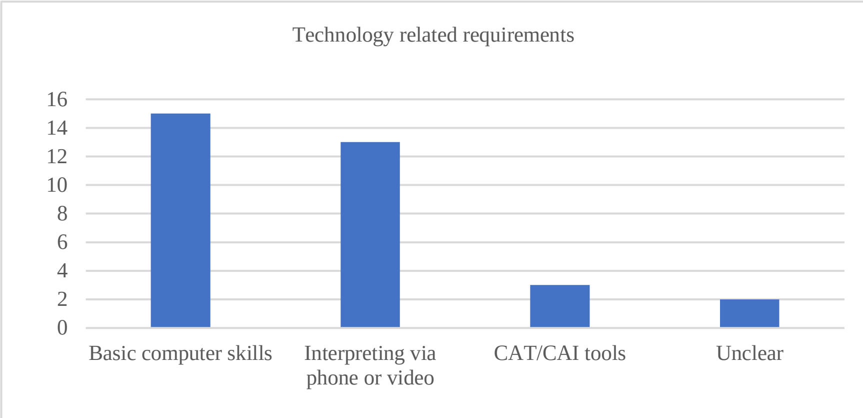

Figure 3 illustrates the technology-related requirements found in the job advertisements. Among the twenty-four advertisements analyzed, only two do not mention any technology-related skills or experience. The majority of job advertisements mentioned requirements on computer literacy, which is a basic ability for professional interpreters. As distance interpreting is in demand, proficiency in using audio-mediated or video-mediated devices for interpreting is also preferred by more than half of the employers. Additionally, three job advertisements highlight the need for proficiency in using translation tools and terminology management, a feature found in some CAI tools like InterpretBank.

This exploratory study of twenty-four job advertisements provides a snapshot of the technological demands in the current U.S. interpreting job market. Although relatively few advertisements mention CAI tools specifically, this does not necessarily suggest that these tools lack importance in interpreting practice. Job advertisements, due to space constraints, might not list all the technology-related tools and devices used in the jobs, prioritizing other qualifications like degrees or experience. The inclusion of terminology management—a common feature of CAI tools—in some job advertisements highlights an emerging awareness of CAI integration in the field, and it is possible that familiarity with such tools may become a standard expectation for interpreters in the future. It may be valuable to prepare students of interpreting with abilities to make use of CAI tools.

Additionally, distance interpreting, both audio and video-mediated, appears to be common practice, based on the job advertisements examined. Interpreting students should develop the skills needed for distance interpreting to better align with market demands.

4. Lesson Plan

This study highlights the significance of CAI tools in enhancing the interpreting process by improving productivity, accuracy, and efficiency. A key objective of this research is to integrate these technologies into interpreting courses. Accordingly, this research proposes the following modules to be integrated into a two-credit, MA-level “Interpreting and Technology” course, with each module lasting one hour and forty minutes. The primary goal of the lesson plan is to introduce students to a variety of technological tools available to interpreters, while also contributing to the development of their professional skills. Students should have completed a prerequisite course, such as Introduction to Interpreting, to ensure they have a foundational understanding of interpreting practices and modalities before enrolling in this course.

Through this lesson plan, students will gain practical knowledge of innovative CAI tools and experience using InterpretBank in their interpreting practice. Additionally, the lesson plan familiarizes students with the basic concepts of distance interpreting and helps students adapt to the cutting-edge technological tools that can be used for interpreting remotely.

The lesson plan consists of 3 modules. The first module (Module 10, see Appendix 1) introduces the basic concepts involved in interpreting with CAI tools remotely and simultaneously. The second module (Module 11, see Appendix 2) focuses on the terminology-building feature of CAI tools. Students will have hands-on experience in creating multilingual glossaries and extracting terminology, especially in the preparation stage of interpreting. The third module (Module 12, see Appendix 3) highlights the voice recognition/ automatic speech recognition (ASR) feature of InterpretBank. Students will participate in simultaneous interpreting exercises, gaining practical experience with ASR technology during the interpreting process.

5. Conclusion

This paper has addressed distance interpreting, which was made possible by advancement of technology, and has experienced high demand during and after the COVID-19 pandemic. This paper also has discussed the significance of CAI and ASR technologies, especially their potential to improve the workflows of interpreters. Through our investigation into the need for the incorporation of technological tools in interpreting courses, this research proposed a didactical lesson plan for integrating CAI tools and ASR into an MA-level interpreting curriculum at American universities. This lesson plan could also offer inspiration for interpreting curriculum design in other regions or for self-study by interpreting students.

This study aims to help reduce the reluctance to use CAI technologies, particularly those with speech recognition functions, in interpreting courses. It also seeks to encourage educators or instructors to incorporate CAI and ASR tools in curriculum design, given their importance in enhancing professionalization, and improving interpreting output and quality. This research project has outlined possible directions forward, with the next steps involving empirical validation through robust interview data and feedback from students and professional interpreters. For future studies, researchers may explore how codes of ethics for interpreting should adapt to the recent technological advancements like AI-based CAI tools. Interpreting scholars and professionals may further research how to develop and improve speech recognition tools for interpreting and reduce their drawbacks such as algorithmic bias and lack of privacy protection. Researchers may also explore human-machine symbiosis in interpreting practice, address issues and develop models of human-centered machine interpreting.

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Appendix 1: Module 10

Topic	**INTRODUCTION TO COMPUTER-ASSISTED INTERPRETING TOOLS (CAI) AND AUTOMATIC SPEECH RECOGNITION (ASR)**
Overall Aims	1. To gain an understanding of the basic concepts and features of CAI tools (including but not limited to ASR). 2. To recognize different types of CAI tools, critically explore their functionality and their effects on interpreting.
Learning Outcomes	*By the end of this module, students will be able to:* 1. Identify CAI tools and ASR functions. 2. Summarize the main characteristics of CAI tools. 3. Recognize the benefits, drawbacks, and ethical issues of using CAI tools in different modalities of interpreting. 4. Demonstrate understanding of the main features of InterpretBank, the CAI tool we will be using for the following two weeks.
Main Topics	*Warm-up discussion:* ♦ What are distance interpreting and remote interpreting? ♦ What are the main modalities of distance interpreting? *Topics:* 1. What is CAI? 2. The application of voice recognition and terminology functions in CAI tools. 3. Why should we incorporate CAI tools in interpreting practice? -- the pros and cons of CAI tools 4. Ethical concerns of using CAI tools 5. What is InterpretBank?
Suggested Learning Materials	*Articles:* ♦ Fantinuoli, C. (2017a). Computer-assisted interpreting: Challenges and future perspectives. In I. Durán Muñoz & G. C. Pastor (Eds.), *Trends in e-tools and*

	resources for translators and interpreters (pp. 153-174). Leiden: Brill. ♦ Defrancq, B., & Fantinuoli, C. (2021). Automatic speech recognition in the booth: Assessment of system performance, interpreters' performances and interactions in the context of numbers. *Target*, 33(1), 73-102. ♦ Braun, S. (2019). Technology and interpreting. *The Routledge Handbook of Translation and Technology*. New York: Routledge. https://doi. org/10.4324/9781315311258-16. ♦ Horváth, I. (2022). AI in interpreting: Ethical considerations. *Across Languages and Cultures*, *23*(1), 1-13. *Optional:* ♦ Bowker, L. (2002). *Computer-aided Translation Technology: A Practical Introduction*. University of Ottawa Press. *YouTube Videos:* ♦ What is a CAT tool? Translation 101 (*https://www.youtube.com/watch?v=5GhX1XA_vsA*) ♦ 8+ Types of Interpreting Services EXPLAINED || Interpretation 101 (*https://www.youtube.com/watch?v=MGmffejFm4s*) ♦ What is Simultaneous Interpreting? (*https://www.youtube.com/watch?v=2qgS4V8RWU4*) *Blogs:* ♦ CAT Tools 101: Computer-Assisted Translation Software (*https://www.pairaphrase.com/cat-tools/*)
Assignments	Write a blog on CAI tools. You may introduce or compare the tools, talk about your opinion on applying CAI tools in interpreting practice, or discuss how CAI tools have influenced the interpreting industry based on existing articles and your own observation/experience. Please upload your blog to our class Google Drive file, don't forget to include a bibliography. The word count is about 250 words.

Appendix 2: Module 11

Topic	**CAI TOOLS: INTERPRETBANK – TERMINOLOGY**
Overall Aims	To demonstrate how a CAI tool with terminology-related features can help interpreters prepare for an interpreting assignment.
Learning Outcomes	*By the end of this module, students will be able to:* 1. Download and run Interpretbank on a computer. 2. Generate terminology from preparation materials using InterpretBank. 3. Import/export terminology online and offline on InterpretBank.
Main Topics	1. How to download InterpretBank? 2. How to use InterpretBank to create a bilingual/multilingual glossary? 3. How to import existing terminology from online and offline resources and export terminology from InterpretBank? 4. How to use IntepretBank to look up terms and their translation?
Suggested Learning Materials	*Articles:* ♦ Fantinuoli, C. (2017b). Computer-assisted preparation in conference interpreting. *Translation and Interpreting*, *9*(2), 24–37. https://doi.org/10.12807/ti.109202.2017.a02 ♦ Xu, R. (2018). Corpus-based terminological preparation for simultaneous interpreting. *Interpreting*, 20(1), 29-5 ♦ Rütten, A. (2017). Terminology management tools for conference interpreters: Current tools and how they address the specific needs of interpreters. In J. Esteves-Ferreira, J. Macan, R. Mitkov, & O.-M. Stefanov (Eds.), *Proceedings of the 39th Conference Translating and the Computer* (pp. 98-103). Geneva: Editions Tradulex. *Optional:* ♦ Ziegler, K., & Gigliobianco, S. (2018). Present? Remote? Remotely present! New technological approaches to remote simultaneous conference

Topic	**CAI TOOLS: INTERPRETBANK – TERMINOLOGY**
	interpreting. In C. Fantinuoli (ed.), *Interpreting and technology*, *11* (pp.119-139). *YouTube Videos:* ♦ InterpretBank with Automatic Speech Recognition (*https://www.youtube.com/watch?v=w5dC17o0Sts*) ♦ Terminology Extraction (*https://youtu.be/U6G0eh9ZeB8*)
Assignments	*Forum discussion:* How has your experience been using InterpretBank creating your terminology and sharing it with your colleagues? (you may talk about accuracy, effort, convenience, efficiency, etc.)

Appendix 3: Module 12

Topic	**CAI TOOLS: INTERPRETBANK – VOICE RECOGNITION**
Overall Aims	To experience and reflect on using voice recognition function during interpreting.
Learning Outcomes	*By the end of this module, students will be able to:* 1. Use the InterpretBank automatic speech recognition (ASR) 2. Integrate InterpretBank functions into the interpreting process. 3. Reflect on their experience using the ASR feature of InterpretBank.
Main Topics	1. How to set up your computer to run the InterpretBank ASR? 2. Integrating ASR into the interpreting process, what can it provide? 3. Pros and cons of ASR. 4. Practice: using the ASR function in InterpretBank during interpreting.
Suggested Learning Materials	*Articles:* ♦ Fantinuoli, C. (2016a). InterpretBank: Redefining computer-assisted interpreting tools. In J. Esteves-

Topic	**CAI TOOLS: INTERPRETBANK – VOICE RECOGNITION**
	Ferreira, J. Macan, R. Mitkov, & O.-M. Stefanov (Eds.), *Proceedings of the Translating and the Computer 38th Conference* (pp. 42-52). Geneva: Editions Tradulex. ♦Fantinuoli, C. (2017c). Speech recognition in the interpreter workstation. In J. Esteves-Ferreira, J. Macan, R. Mitkov, & O.-M. Stefanov (Eds.), *Proceedings of the 39th Conference Translating and the Computer* (pp. 25-34). Geneva: Editions Tradulex. *Optional:* ♦Dong, Y. & Deng, L. (2015). *Automatic speech recognition: a deep learning approach*. Springer, London. *YouTube Videos:* ♦ How to Set Up Your Computer to Run the InterpretBank ASR Demo (*https://www.youtube.com/watch?v=BNI3qH10b6o*)
Tools	InterpretBank
Out-of-Class Activity	**"Systematizing your interpreting workflow with CAI tools"** *Background:* You (students) are hired as a part-time interpreter for a children's hospital. You are assigned a job and will be interpreting remotely via phone for a pediatrician and the parent of her patient in your language pair. ♦ Students will be assigned this job after the class of module 11 (when they learned how to use the terminology feature of InterpretBank), so they can begin preparing for the assignment. In this class, the instructor teaches the ASR feature of InterpretBank and schedules the time for interpreting assignments with the students. One student per time slot. ♦ The instructor and the teaching assistant will play the role of the pediatrician and the parent of the patient, and provide feedback once the interpreting is finished. *Instructions:* Pre-assignment: you will be briefed by email and learn more details about this assignment. Based on the briefing,

Topic	**CAI TOOLS: INTERPRETBANK – VOICE RECOGNITION**
	prepare a bilingual glossary using InterpretBank for your assignment. You can use this glossary for studying unfamiliar terms. Share this glossary with your colleagues and download their glossaries using InterpretBank for your reference. Delivery: make sure you have ASR opened for InterpretBank. Use this feature to help you grasp the terms and numbers. Post-assignment: extract your final terminology list from InterpretBank and save it to both the database and your own computer for future needs. Prepare a report on your experience using InterpretBank.
Assignments	1. Forum discussion: If you want to use InterpretBank more professionally, what would you think the challenges are that you may encounter? 2. Exercise: in groups of two, find two short scripts for simultaneous interpreting. One reads the script and the other one interprets simultaneously with the help of InterpretBank. And then exchange roles.