How Are Conference Interpreters Using Technology Before, During, and After Interpreting? An Analysis of Korea's Case[*]

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This study investigates the use of Computer-Assisted Interpreting (CAI) tools among interpreters in Korea to gain insights into their technological practices before, during, and after interpreting. To this end, the Korean Association of Translators and Interpreters (KATI) conducted a survey in February 2023, targeting 200 active conference interpreters. In the pre-interpreting phase, interpreters frequently use paper, laptop computers, and general office tools, while specialized glossary software is underused. During interpreting, tools were used differently for simultaneous and consecutive interpreting, in both online and offline settings. Pen and paper remain the most popular note-taking tools during consecutive interpreting. Subsequent to interpreting, the respondents organized glossaries, wrote transcripts, and monitored video and audio recordings using various tools. In this regard, respondents indicated the usefulness of voice recognition, specialized terminology, numerical conversions, and collaboration tools. To promote efficiency in the work environment for Korean interpreters, this study recommends developing CAI tools tailored for Korean users and improving relevant training.

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1. Introduction

Technology[1] has long transformed the ways in which people live, work, and communicate, and the work environment of conference interpreters is no exception. In the aftermath of the pandemic and the ongoing tide of the Fourth Industrial Revolution, the work environment for conference interpreters has undergone significant upheaval due to a surge in remote interpreting and the emergence of numerous digital tools. Against this background, the Korean Association of Translators and Interpreters established new workplace standards and guidelines in 2023, along with training sessions to help the community of interpreters and translators in South Korea adapt to the novel environment. Notably, this research was conducted in Korea in 2023, a time when generative artificial intelligence was just beginning to emerge, and the public began anticipating great transformations. Furthermore, investigating the use of tools by interpreters in Korea at the time is also significant as the country was one of the world's most connected countries and a leading host of international conferences where interpreting is in demand. According to a 2022 report published by the Korea Tourism Organization, Korea ranked second globally as a host of international conferences in 2021. According to Electronic Times (March 22, 2023), internet service penetration in the country stood at 98% and Korea outperformed the G7 economies in key ICT indicators such as the adoption of 4G Long-Term Evolution (LTE), mobile phones and internet services by households and individuals. The Republic of Korea is also where the Go match of the century between master Lee Sedol and the computer programme

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1) The terms 'technology' and 'tools' are used synonymously in this paper to refer to "the ensemble of artifacts intended to function as relatively efficient means" as defined by Willoughby (2004: 38). Other terms associated with technology, such as 'technological practices' are also used as defined in Willoughby (2004: 38).

AlphaGo took place in 2016. In such an environment, how technologically adept are Korean interpreters?

Contrary to the tech-savvy ambience of the nation, it is quite surprising that the topic of technology use by translators and interpreters has received relatively little attention from academia in Korea until recently, compared to other regions like Europe or China where translation memories and other technologies to facilitate the translation process have been explored for decades. Since the very first research paper on technology-assisted interpreting and education in 2012 (Lee and Choi)[2], a total of 39 studies on CAI (Computer-Assisted Interpretation) and CAIT (Computer-Assisted Interpreter Training) have been published in South Korea as of April 2024. Of these studies, six focus specifically on the application of CAI in practical interpreting contexts, if we exclude any research on remote interpretation. Additionally, there are four studies on specialized terminology (Choi 2018, 2022a, 2022b; Lee and Lee 2020) and two studies on voice recognition (Lee 2021, 2022b). Research on machine translation (MT) became a prominent theme for researchers after neural MT was introduced to the public in 2016 (Lee 2020: 76-77). According to Choi (2019: 276) Korea's first-ever journal of translation studies published a total of 49 research papers on the topic between the years 2007 and 2018. The articles were published at a rate of one or two per year up until 2016 when four articles were published. The number of publications on MT, however, exploded to 14 articles in 2017 followed by at least 21 articles annually since the year 2018 (ibid: 282-3). Initially, studies compared human and machine translation (Choi and Lee 2017; Han 2017; Jin 2017; Park 2017, 2018; J. Lee 2018; J. H. Lee 2018; Kwak and Han 2018; Seo and Kim 2018). This discourse was followed by a wave of calls to leverage the affordances of technology to augment human professionals (Kim 2018; Jin 2020; Lee 2021, 2022a, 2022b, 2022c; Choi 2022a, 2022b).

As shown in these studies, a growing number of Korean researchers are exploring artificial intelligence and machine learning as well as various interpreter assistance tools. CAI refers to a broad suite of technologies that aid in the delivery of interpreting services. As defined in this study, CAI includes terminology management solutions, note-taking

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2) According to the researchers' search on the Korean Citation Index (KCI) database, the first mention of CAI tools in Korea is found in Lee and Choi (2012). While the paper was not focused on CAI per se, the researchers studied the use of a smart pen for note-taking in consecutive interpretation.

tools, speech-to-text programmes, interpreter training tools and computer-assisted translation (CAT) (Tsai 2020: 50). Despite the progress in technologies to assist language professionals, we often find that availability does not always equate to use. This is shown in a number of studies which report that interpreters do not rely heavily on technology (Corpas Pastor and Fern 2016; Corpas Pastor 2018, 2020; Martin 2020; Al-Jarf 2022). In fact, due to cognitive overload and fatigue associated with multitasking, interpreters tend to avoid using technology during interpreting (Braun 2019; Costa et al. 2014b). Despite such existing research, no studies have been conducted to date on how interpreters use technology before, during and after interpreting in the Korean context. To collect the latest information on how conference interpreters in Korea use technologies to assist their profession, KATI conducted a comprehensive survey in February 2023. Based the outcome of the survey, we address the following research questions in this study:

1. How do interpreters in Korea use technologies before, during and after interpreting?
2. Is the status of technology use affected by the interpreter's attributes (age, experience, type of employment)?
3. What are the needs of Korean interpreters when it comes to utilizing CAI?

Whereas most research on interpreters' use of technology to date has been conducted in Europe, studying the situation in South Korea may provide insight into similar situations elsewhere, including Asia. Based on the findings of this study, the researchers intend to suggest ways to support interpreters in an increasingly technology-driven future and begin to build a framework that, with adequate data from follow-up studies, can eventually help us improve work environments and standards. As such, this research potentially contributes to the body of findings to be shared with potential employers, standards bodies, policymakers and industry stakeholders. Before presenting an analysis of the survey responses, the next section will provide an overview of the latest research on CAI tools.

2. Current Research on CAI

CAI tools are a broad suite of tools encompassing terminology management, corpora, speech recognition, translation memory and machine translation devices. In 2010 (Berber-Irabien), interpreters were using online dictionaries and databases, portable electronic dictionaries, CD-ROM dictionaries, DVDs, satellite TV for interpreting practice, Interplex (for terminology management), Trados Multiterm (for term extraction), Dragon Naturally Speaking (for speech recognition) and portable MP3 players. Some of these technologies have faded into obscurity, such as CD-ROMs and MP3s, while the number of web-based terminology tools and interpreter applications has risen quite significantly. According to Ortiz and Cavallo (2018: 19), CAI tools can be used for terminology management, corpus building, term extraction, note-taking, speech recognition and remote interpreting. These categories will be used to summarise the tools found in the literature.

Firstly, terminology management tools edit, store, manage and search glossaries, which are often used before interpreting. Booth-friendly examples include Interpreters' Help and InterpretBank. The Interpreters' Help app can be used with BoothMate, a free app that allows terms to be searched without an internet connection, while InterpretBank combines speech recognition and term extraction. Several universities and organisations in Europe and Asia as well as the OECD have adopted the latter (Prandi 2015; Fantinuoli 2016; Rütten 2017). Interpreters' Help, Interplex, Intragloss and LookUp are used by some universities in Germany (Tarasenko et al. 2021). There are other studies (Costa et al. 2014a, 2014b; Corpas Pastor 2018) that mention Interpreter's Wizard, the glossary generation function in EU-Bridge, and Flashterm.

Tools for corpus building such as BootCat are discussed by Fantinuoli (2006) and Cho (2021). Such tools build corpora by finding URLs of web pages based on keywords or combinations of keywords entered by the user. Ortiz and Cavallo (2018) mention SDL Multiterm Extract, Simple Extractor, Sketch Engine, Terminus and TermSuite. For interpreters' preparation phases, Sketch Engine is also included in studies by Xu (2018) and Choi (2018).

Technology-assisted consecutive interpreting includes the use of digital pens and

recorders. Due to the commercial availability of electronic devices in the mid-to-late 2000s, researchers began experimenting with the use of voice recorders for consecutive interpreting (Hamidi and Pöchhacker 2007). Orlando (2014, 2015) and Braun (2019) experimented with the concept of "SimConsec", otherwise known as simultaneous consecutive interpreting. The researchers used a special dot paper connected to a computer and a digital pen to take notes while the speaker was speaking, then tried to interpret the speech while playing back the speaker's voice and reading from the notes. The proliferation of tablet PCs in the 2010s also led to research on consecutive interpreting utilising note-taking applications on tablets (Goldsmith 2018), a field yet to be explored further (Fantinuoli 2021).

The early 2010s similarly saw the emergence of speech recognition tools. Gaber et al. (2020) examined apps that facilitate transcription of video files and Lee (2022b) categorised speech recognition apps according to their functions and summarised the best apps for interpreting situations. Several general-purpose speech recognition features in Google, Microsoft, Dragon Naturally Speaking and ClovaNote have been tested for consecutive and simultaneous interpreting and sentence segmentation (Wang and Wang 2019; Lee 2021, 2022a, 2022b). Defrancq and Fantinuoli (2021), Fantinuoli and Dastyar (2022) and Choi (2022b) have developed systems that can recognise and extract numbers and jargon.

Chen and Kruger (2023) devised a method that incorporates voice recognition into consecutive interpreting, testing the efficiency of Computer-Assisted Consecutive Interpreting (CACI). The method involves interpreters respeaking the original sound into voice recognition to produce text, which is then inputted into machine translation (MT) for interpreting. The system highlights the corresponding part of the source text when the cursor is placed over a sentence generated by machine translation. The left side of Figure 1 shows the voice recognition of the source text, and the right side shows the machine translation results. Apparently, the system is in the process of development.
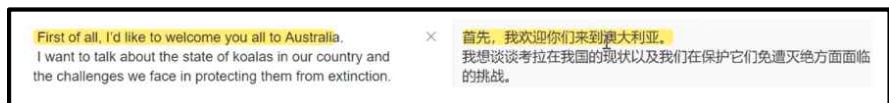
Figure 1. A Case of CACI, a Convergence of Voice Recognition and MT
(Chen and Kruger 2023: 407)

With the onset of the pandemic, interpreters have been increasingly using video conferencing systems. Sang's survey (2020: 136) indicates that the demand for Interprefy, a cloud-based remote simultaneous interpreting platform launched at the end of 2019, has grown dramatically since April 2020. In the Japanese market, it was initially anticipated that the pandemic would boost the demand for remote interpreting platforms such as Interprefy, InterpreteX, KUDO and Interactio. Instead, Zoom with its simplified simultaneous interpreting features was used overwhelmingly more in the field, due to its affordability and accessibility (ibid: 145). Meanwhile, efforts are underway to add new features that support simultaneous interpreting in existing remote conferencing platforms. SmarTerp, as discussed by Rodriguez et al. (2021) and Fritella (2022), offers a collaboration window for handover, a view of the speaker's presentation materials and extraction of terminology and numbers using speech recognition. Table 1 summarises the CAI tools discussed above.

Table 1. Overview of CAI by Type

	Functionalities	Products/ Services	Description (if applicable)
CAI	Corpus extractor/ manager	BootCaT, SDL Multiterm Extract, Simple Extractor, Sketch Engine, Terminus, TermSuite, Translated s.r.l, Kea, JATE	
	Term extractor/ manager	Interpreters' Help, Interplex, InterpretBank, Intragloss, LookUp	
	Speech recognition	Dragon Naturally Speaking, speech recognition features of Google and Microsoft, Naver Clover Note	
	Translation memory		
	Machine translation		
	Speech banks	Speech Repository	
	RSI platforms	Interprefy, InterpreteX, KUDO, Interactio, Zoom, SmarTerp	Features vary by platform. SmarTerp can extract terms based on speech recognition (proper noun, terminology, numbers) and provide a collaboration window for interpreting partners.

	Consecutive interpreting-specific applications	Voice recorder, digital (smart) pen	
	All-inclusive (integrated platform)	Voice-text integrated system for interpreters (VIP)	Term/corpus extractor/manager, speech recognition, QA, suggest symbols for note-taking, text summary, sight translation drills.

A number of studies examined the use of technology by interpreters. Berber-Irabien (2010) studied how 200 interpreters in Europe use a variety of technological tools and Bilgen (2009) proposed ideas to develop a glossary for interpreters based on a survey of interpreters. According to Pérez Pérez (2013), students produced better interpreting when using corpus management software. Despite constant technological developments and experiments showing their value, studies suggest that it is difficult to use these tools during interpreting. Corpas Pastor and Fern (2016) surveyed 133 interpreters in Europe about their use of technology during interpreting preparation and performance and found that it was rare for respondents to use technology when interpreting; they mostly used bilingual dictionaries and glossaries. About 50% of interpreters used technology to prepare for interpreting. Only UN and EU conference interpreters reported using multimedia databases, term banks, or dictionaries and glossaries during or before interpreting. The only technological tools used by the other participants were handheld devices like earphones, microphones, laptops, tablets and smartphones. Meanwhile, in a study by Melinger and Hanson (2018), an online survey conducted with 152 interpreters showed that conference interpreters use a greater number of devices in greater proportions compared to community interpreters. Additionally, a positive correlation was found between the tendency to adopt technology and communication anxiety, indicating that higher levels of anxiety are associated with a preference for mediated communication through technology and a desire to rely on technological resources or equipment for support in interpreting tasks.

The following chapter presents the results of a recent survey in Korea to provide an overview of how Korean interpreters use technology in 2023. As no comprehensive

survey has been identified regarding the technological adoption by interpreters in the aftermath of the COVID-19 crisis in the 2020s, the findings of this study are expected to offer substantial insights not only into the context of Korea but also implications for other regions.

3. Results

3.1. Overview of Survey

From February 6th to 13th, 2023, a survey was administered to active conference interpreters in Korea, resulting in a total of 200 valid responses. Respondents included members of KATI and graduates of major translation and interpreting master's degree programmes in Seoul, including Hankuk University of Foreign Studies, Ewha Womans University, Chung-Ang University and Seoul University of Foreign Studies. Google Forms was used to collect anonymous responses. The respondents provided consent to offer information for the purpose of the survey and were provided customary compensation for their participation. Table 2 presents the attributes of respondents.

Table 2. Respondent Attributes

Category	Description
Age group	40s (29.5%), 30s (56.5%), 20s (12.5%)
Gender	Female (92.5%), Male (7.5%)
Freelance	< 1 year (22.5%), 1 − < 2 years (15.5%), 2 − < 5 years (11.5%), 5 − < 10 years (15%), 10 + years (16.5%), None (19%)
In-house	< 1 year (12%), 1 − < 2 years (19%), 2 − < 5 years (30%), 5 − < 10 years (14.5%), 10 + years (3.5%), None (21%)
A language	Korean (89%), English (5.5%), Japanese (4%), Chinese (1%), Other (0.5%)
B language	English (69.5%), Japanese (20%), Chinese (7%)
Employment type	Freelance (45%), In-house (44%), Unclear (11%)

As for language combinations, this study will use the International Association of Conference Interpreters (AIIC) definition of A and B languages, where A is the interpreter's native language (or its strict equivalent) and B is the language in which the interpreter is fluent, but not a native speaker. The term "other languages" as used in this study means a language other than these working language combinations of the interpreter.

The survey contained a mix of closed-ended multiple-choice questions with an option to provide details and some open-ended questions. Five professional interpreters tested and provided feedback on the survey for clarity and ease of understanding[3]. Respondents were asked 40 questions about their use of technologies in three categories: pre-interpreting, during interpreting and post-interpreting (Will 2020). The second category covered interpreting tools, sound equipment, consecutive interpreting, remote interpreting and speech recognition software. Finally, respondents were asked how technology and their work environment could be improved. Responses will be discussed by item in the next section.

3.2. Findings

This section analyzes the responses from 200 Korean conference interpreters based on each category of the survey, which are pre-interpreting, during interpreting, and post-interpreting.

3.2.1. Uses of technology in the pre-interpreting phase

3.2.1.1. Medium used to read conference materials

For the pre-interpreting phase, the first question on the survey was "What method do you use to read the conference materials?". A summary of the results by type of material including MS Word documents, PowerPoint slides, and audio-visual materials can be found in Table 3.

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3) Five interpreters did not respond.

Table 3. Preferred Medium to Read Conference Materials

Material / Medium	Text (Word)	PowerPoint	Audio-visual
Paper	36.5%	29.5%	-
Laptop	47%	48.5%	77.5%
Tablet	13%	18.5%	11.5%
Smartphone	1%	1%	9.5%
Desktop	1%	1%	1.5%

While we are witnessing a general transition to the paperless era, this study also found that one-third (36.5% for text and 29.5% for PowerPoint) of the respondents prefer to read on paper, regardless of age. Delgado et al. (2018) suggest that paper has an advantage when it comes to reader comprehension, especially when time is limited. The responses during this survey also show that despite the commercialization of handwriting-capable devices, interpreters predominantly rely on printed materials. Furthermore, even though tablets and other mobile devices are convenient, it is noteworthy that many respondents prefer to read Word documents and PowerPoint slides on laptops: over half of all respondents read Word documents and PowerPoint slides on laptops. Laptops may be more popular because mobile phones and tablets have smaller screens and limited functionality, and laptops make accessing materials on-site easier.

3.2.1.2. Resources used to prepare for interpreting

Next, respondents were asked to select all the resources they used to prepare for interpreting. Figure 2 shows the results.
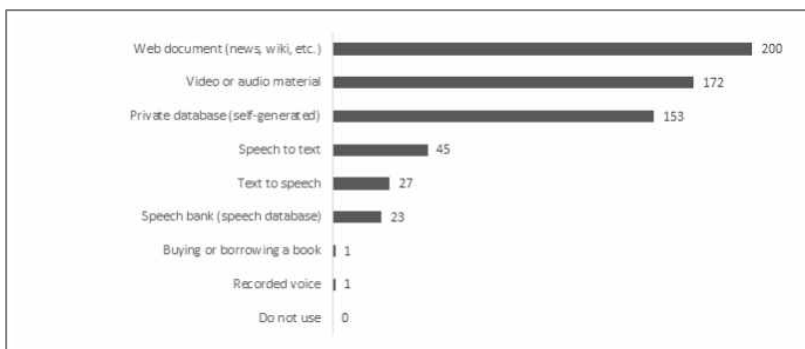
Figure 2. Resources to Prepare for Interpreting (Unit: headcount)

The largest number of respondents use web documents to familiarise themselves with conference materials and terminology, including e-journals, newspapers and wikis. In more than half of the cases, interpreters created their own databases. Furthermore, only 22.5 percent of respondents said they use speech-to-text and 13.5 percent said they use text-to-speech features. The usage of speech collections on websites (Speech bank) is low at 12.5 percent, possibly because there are not many sites containing speech materials for interpreting studies in the country.

3.2.1.3. Tools used after conference topic and materials are given

The interpreters were then asked to specify what office tools they use once the conference topic and materials are given, with the results shown in Figure 3.
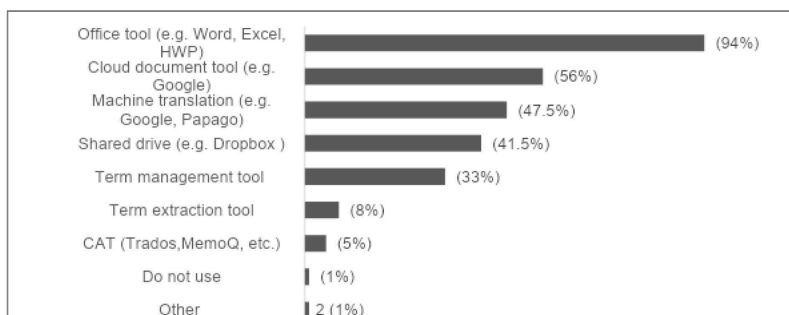

Figure 3. Tools Used After Conference Materials and Topic Are Given

The responses show that most interpreters used general-purpose office tools such as MS Word, Excel and a common local programme called Hangul. More than half of the interpreters used cloud documents, machine translation, and shared drives. Additionally, we found that terminology management and CAT tools were not widely used.

3.2.1.4. Terminology management and extraction tools

According to Figure 3, a third of respondents use terminology management and extraction tools, and Figure 4 summarizes the specific tools they use.
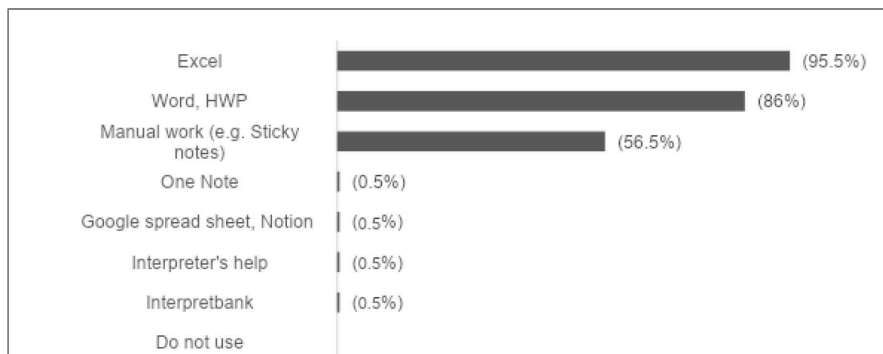

Figure 4. Tools Used for Terminology Management and Extraction

The responses show that general-purpose office solutions such as Microsoft Excel, Word and Hangul are again the most used (95.5%), followed by manual sticky notes and other non-digital methods (56.5%). Only 1% of the respondents use specialised terminology management tools, such as InterpretBank and Interpreters' Help and 8% use terminology extraction tools, with 6% using SDL Multiterm Extract and the remaining 2% using Sketch Engine and BootCat. In Korea, many of these tools are either prepaid or require approval before they can be used, so they may not be as convenient as in other countries. Despite this, it is possible that the usage of these tools might increase if software tailored to the domestic market were introduced.

3.2.1.5. Use of machine translation and CAT

When it comes to the use of machine translation (MT) and CAT, the survey found that

except for 5.5 percent of respondents who explicitly answered that they do not utilise MT at all, nearly 60 percent of the interpreters employ MT after obtaining conference materials. Almost 60 percent of respondents used MT to translate conference materials from a language other than their A and B languages. Based on studies indicating that professional translators are generally skeptical about using machine translation (Cadwell et al. 2018; Lesznyák 2019), the researchers of this paper had expected that interpreters might not use machine translation extensively. However, it was intriguing to find that interpreters who answered the survey do, in fact, frequently use machine translation. It indicates that as the quality of MT improves in the future, we should expect that an increasing number of interpreters will use it to assist their preparation of interpreting, regardless of the language combination. Table 4 compares the use of machine translation by respondents' languages combinations.

Table 4. MT Use by Interpreter's Language Combination (Unit: headcount)

Interpreter's Language / Language of document	English	Japanese	Chinese
Other than A & B languages	71 (53%)	34 (85%)	9 (64%)
Language A	51 (36%)	18 (45%)	9 (64%)
Language B	64 (46%)	9 (22%)	9 (64%)
Total	139	61	27

Table 4 demonstrates that the most common use of MT by interpreters during this phase is to translate materials from languages other than their A or B languages. Most Korean-Japanese interpreters used MT for this purpose (85%), followed by Korean-Chinese (64%) and Korean-English (53%) interpreters. This may be partly due to English being the lingua franca in conference materials provided to non-English interpreters.

The MT engines most often used are Google Translate (80%), Naver's Papago Translate (55%) and other tools such as DeepL, Baidu, Kakao Translate and PowerPoint's MT feature were used by a few respondents. Some respondents also mentioned ChatGPT. Noting that this is a February 2023 outcome, it may be expected that generative AI translation solutions will become more popular, including ChatGPT

and DeepL, which have launched in 2022 and 2023, respectively.

Another noteworthy observation is that MT engines vary based on the interpreter's language combination. For example, Korean-Japanese and Korean-Chinese interpreters mostly use both Papago and Google (45% and 71%, respectively) while Korean-English interpreters mostly use Google alone (46%). The researchers believe that the choice of MT engines may be affected by marketing or the otherwise perceived performance of such engines.

In this survey, we found that CAT is still not widely used among Korean interpreters. Sixty-five percent of respondents do not use software customised for the language service professionals. Among those who do, Trados was the most popular (30%), followed by Memsource (10%), MemoQ (4%) and SmartCat (1.5%).

Table 5. CAT and MT Use (Unit: headcount)

CAT users	MT users	Total
O	O	68
O	X	2
X	O	127
X	X	3

Since it is possible that CAT users resort to MT engines that are available in the CAT platforms, the researchers investigated if the use of the two tools was related but found that they were mutually independent (Table 5). About one-third (34%) of the interpreters surveyed used both CAT and machine translation during preparation.

Furthermore, we investigated how freelancers and in-house interpreters use CAT and MT and found greater use of CAT tools among freelancers than their in-house counterparts. CAT is not used by 57% of freelancers and 72% of in-house interpreters, and more than one CAT programme was used by only 12% of freelance interpreters and 7% of in-house interpreters. More freelancers were using more than one CAT programmes relative to their in-house counterparts. Possibly, this is because in-house interpreters rely mostly on their employer's resources and may be less motivated to purchase their own whereas for freelance interpreters, using their own CAT tool may

give them a better position in the market. The disparity may also exist because freelance interpreters generally deal with multiple clients with differing needs, while in-house interpreters typically need to consider one employer.

In contrast, the survey revealed that compared to freelancers, more in-house translators use MT, and more in-house interpreters (42%) use multiple MT engines than freelancers (37%). We found that 5.5 percent of freelancers and 1.1 percent of in-house interpreters do not use MT. It may be worth noting that the freelancers surveyed were older and more experienced than their in-house counterparts in the survey. Specifically, freelancers were 34.5 years old with 8.5 years' work experience on average, while in-house interpreters were 30.2 years old with 5.2 years of experience on average. Although further research is needed to draw any conclusions, it will be worth examining in a follow-up study whether younger and less experienced interpreters tend to use MT more, or more openly.

To sum up, for the pre-interpreting phase, laptops and paper are primarily used for the preparation of interpreting tasks, while web documents and general-purpose office tools are primarily used for organising data. Furthermore, specialised terminology management and extraction tools developed mostly in Europe are rarely used by Korean interpreters and about 35% of the Korean interpreters use CAT software in the preparation phase.

3.2.2. During the interpreting phase

3.2.2.1. Use of hardware and software

The second group of questions concerned the tools used during interpreting. The questions were further divided into online simultaneous interpreting, offline simultaneous interpreting, online consecutive interpreting and offline consecutive interpreting.

The first set of questions asked respondents to indicate all applicable portable equipment (hardware) they use in the field. The questions sequentially asked about offline simultaneous interpreting, online simultaneous interpreting, offline consecutive interpreting and online consecutive interpreting. Figure 5 summarizes the results.
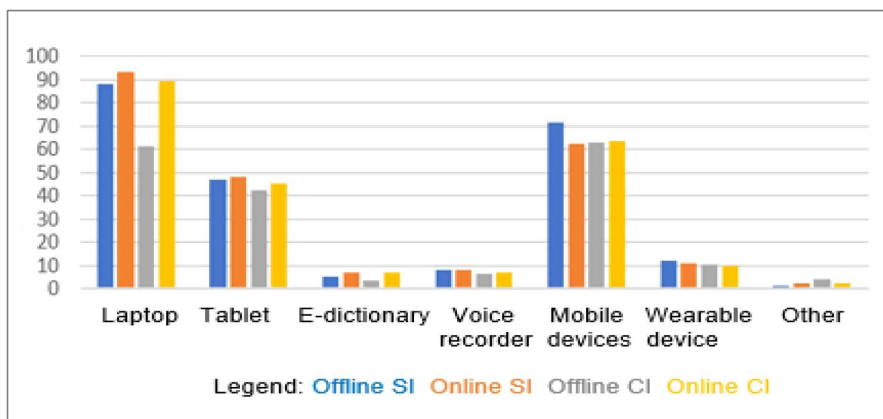
Figure 5. Hardware Used During Interpreting

As illustrated, approximately 90 percent of respondents used laptops for online simultaneous (93.5%) and consecutive interpreting (89.5%), whereas 61.5 percent use laptop for offline consecutive interpreting. The low use of laptops during offline consecutive interpreting situations may be explained by the fact that interpreters are quite occupied taking notes during the interpreting process, which possibly limits the tools they can carry and use. Among other hardware, mobile devices were used by 62.5 percent (Online SI) to 71.5 percent (Offline SI) of the respondents. Less than 10 percent of the respondents apparently use electronic dictionaries and voice recorders, indicating that these tools have likely been replaced by mobile devices. Smartwatches (wearable devices) are also used by less than 10 percent of the respondents, and it remains to be seen what additional functionalities will be developed for these devices to serve as aids in interpreting.

The next set of questions asked the respondents to select all the software applications they use in the field during interpreting, including laptops, mobile devices and tablets. Figure 6 shows the results.
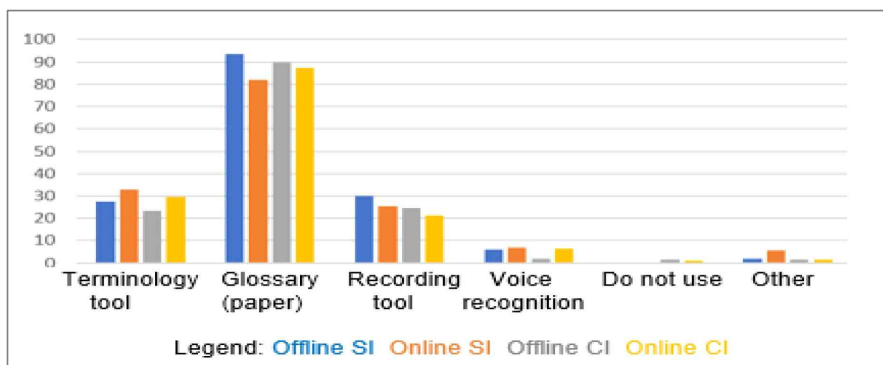
Figure 6. Software Used During Interpreting

A noteworthy finding is that in both online and offline interpreting, glossaries written on paper were by far the most used. As previously mentioned, the use of terminology management and voice recognition tools among the interpreters was limited. The use of recorders was slightly higher in simultaneous interpreting than in consecutive interpreting. This is likely because having to operate devices in consecutive interpreting settings is relatively more challenging.

3.2.2.2. Use of audio and sound equipment

As a next step, we surveyed the type of audio input device used during simultaneous interpreting, a mode that requires earphones or headphones. Online and offline simultaneous interpreting respondents preferred earphones (44%), followed by headphones (33%). 22% of respondents selected noise cancellation as an important feature. The respondents also mentioned that the quality of the booth equipment provided by the vendor at the site, internet speed and network failures influence sound quality in the field. Responses also showed that the quality of the microphone used by each participant is critical in an online conference because a low-quality microphone used by a remote speaker can undermine even the best output equipment employed by the hosts.

Since interpreters are usually provided with microphones for offline simultaneous interpreting sessions by an equipment supplier, the survey asked what microphones they use when interpreting simultaneously in a remote conference. Table 6 provides a breakdown of the responses by in-house and freelance interpreters.

Table 6. The Use of Microphones by In-house and Freelancers (Unit: headcount)

Group / Microphone	In-house	Freelance	Total
Computer built-in	8	6	14
Earphone built-in	30	25	55
Headphone built-in	29	23	52
External USB	17	31	48
XLR	2	0	2

We note that among the findings, XLR is used only by two in-house interpreters, and few interpreters use their computer's built-in microphone. A higher percentage of in-house interpreters use microphones embedded in their earphones or headsets, while freelance interpreters use external USB microphones more often. The implications of the statistics alone indicate that the freelance interpreters use more devices to improve sound quality. Meanwhile, it is noteworthy that earphones are used at a slightly higher rate than headsets, despite headsets potentially offering better quality in terms of both output and input.

An open-ended question in this section of the survey asked the interpreters to list their favourite vendors for earphones or headphones (Figure 7).
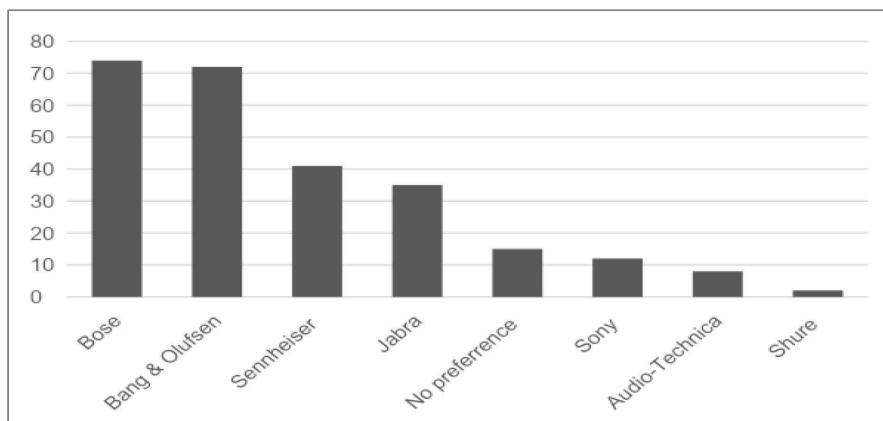

Figure 7. Brand Preference for Earphones/Headphones

In addition to the brands shown in Figure 7, other brand names mentioned include Sears, Logitech, Apple, gaming headsets, Marshall and Skullcandy devices. We also asked if they used different sound equipment online and offline. In almost equal numbers, 49 percent said "yes" and 51 percent said "no". One explanation for why different equipment is used is that equipment vendors generally supply microphones and headphones for offline interpreting sessions while interpreters typically use their own during online sessions where usually more compact and portable equipment is available.

3.2.2.3. Use of tools for note-taking

As for the use of note-taking tools (Figure 8), the survey found that most interpreters in Korea use pen and paper (99.5%) for consecutive interpreting, followed by laptops (13.5%), voice recording applications (9%), digital note-taking applications without voice recording (5.5%), portable keyboards (3.5%), speech recognition applications (2.5%) and digital note-taking applications with a voice recording function (2%).
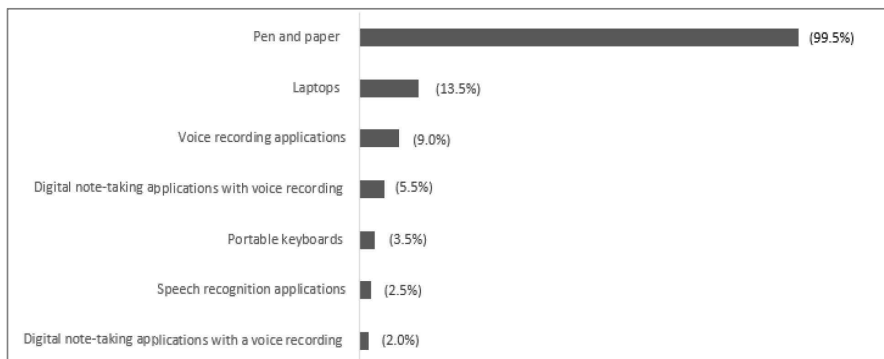

Figure 8. Note-taking Tools Used

Compared to their in-house counterparts, freelance interpreters use more non-paper note-taking tools (35%). Tablet users employ GoodNotes (8.6%), S-Note (6.9%), Samsung Note (5.7%)[4], Notability (2.3%) and Noteshelf (0.6%). These responses suggest that as new generation of students accustomed to using e-textbooks enters the

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4) As of 2024, Samsung mobile devices only come with the Samsung Notes application, and S-Note is no longer installed on the latest devices.

workforce, the tools used for note-taking are likely to continue to change in the future.

3.2.2.4. Use of whispering, remote interpreting and speech recognition solutions

Next, we asked if the respondents had their own whispering (chuchotage[5]) equipment. Only nine percent did, and the brands they used included Wicomedia WIZ900, Wiwi, Hayaco and Goopus.

In response to the question about their preferred remote interpreting systems, the respondents most favoured Zoom (95.5%), followed by Teams (56.5%) and WebEx (48.5%). Only 9.5% preferred Interprefy. Other systems mentioned include Kudo (3%), BlueJeans, VooV, WeChat, Discord, Knox (Samsung), Google Meet, Whereby, and Green Terp (Figure 9).
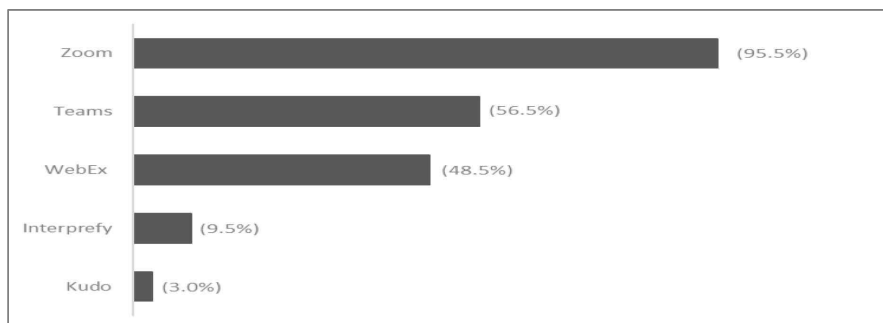

Figure 9. Preferred RSI System

The survey found that 65 percent of remote interpreting is performed at home, while 21.5 percent is done on site. Interestingly, despite the recent pandemic, three freelance interpreters out of 200 had no remote interpreting experience. Simultaneous interpreting is usually performed in shared offices, while consecutive interpreting is more often performed at home. Seven percent of respondents use coworking offices to avoid acoustic distractions or facilitate collaboration.

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5) Whispering is an interpreting mode whereby the interpreter is seated next to one or two meeting participants and whispers the interpreting quietly for only the designated participants. This mode is mainly used when only very few people require interpreting. This interpreting mode is also commonly known by its classic French name, "chuchotage." (https://aiic.org/site/world/conference/glossary)

In response to a question about how partners actually communicate, 44 percent replied that they use in-platform chatting. Coworking spaces are used by 25 percent, video calls are used by 14.5 percent and third-party chatting (KakaoTalk, others) is used by 12 percent (Figure 10).
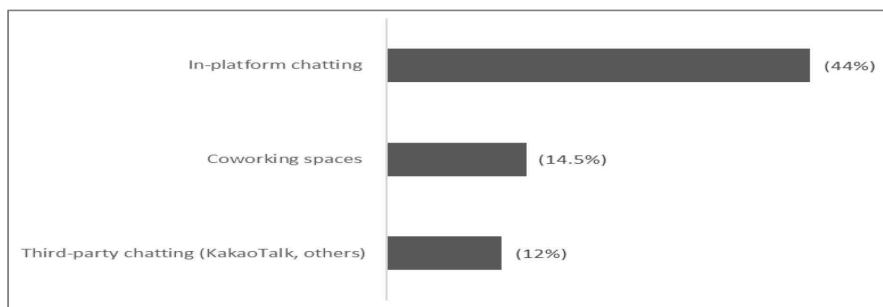

Figure 10. Preferred Collaboration Method During On-line SI

As far as their preferred method of collaboration is concerned, however, KakaoTalk topped the list (57.4%), followed by in-platform chatting, video calls, instant messengers (such as Discord), and Slack. It is likely that in-house interpreters often interpret together at their employer's premises, even in remote conferences, which may explain the higher percentage of "not applicable" responses from them (28%) to this question in comparison to freelancers (15%).

When asked whether they use speech recognition tools during interpreting, 92% of the respondents said they did not. Among those who do (Figure 11), ClovaNote (35.7%) is the most common solution, followed by speech recognition features of Google such as Google Translate and Google Docs (37.5%), Otter (12.5%), speech recognition features of Microsoft such as MS Word and PowerPoint (12.5%) and Bixby (5.4%).
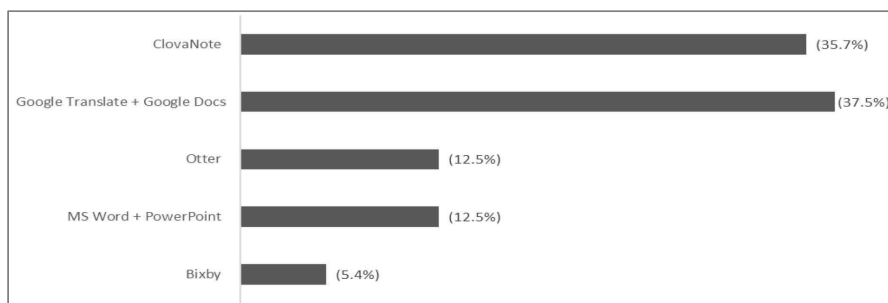
Figure 11. Use of Voice Recognition Tool

Furthermore, more than half of the respondents (54.8%) replied that they use speech recognition tools to monitor their enunciation once the interpreting is done. Transcripts and minutes of meetings were also created using this function. It is worth noting that as of February 2023, as this survey was being conducted, all the speech recognition tools mentioned in the survey were general-purpose as opposed to customized for interpreters. Moreover, speech recognition tools for interpreters, such as InterpretBank ASR and Cymo, have been developed in places around the world such as China and Europe. Although they are paid services, some of these tools are also accessible to South Korean interpreters through registration and login. While their adoption among interpreters in South Korea is not yet widespread, it is worth monitoring their utilization as we progress.

The final question for the interpreting phase was about interpreters' field experience with technology in general. This included any novel technologies they encountered, including speech recognition (17.5%), augmented reality (8.5%) and metaverse (8.5%). In relation to the desired features of interpreting technologies, a digital glossary with real-time search functions was most desired (61%), followed by speech-to-text transcriptions (59%), speech-to-text of numbers (57.5%), speech-to-text of proper nouns (56%) and speech-to-text of terminology (53%), for simultaneous interpreting. High-quality microphones and audio (86%) were the dominant answer for online simultaneous interpreting. The most preferred feature of speech recognition technology was transcription (55.5%) and displays of numbers (53.5%), terminology (49.5%) and proper nouns (46.5%). Furthermore, half of the respondents (50.5%) wanted a collaboration window with their interpreting partners.

Overall, our findings indicate that 81 percent of freelance interpreters and 75 percent of in-house interpreters use technology in one form or another during interpreting. There was a slightly higher ratio of freelancers who use technology in the field, which calls for further investigation as to whether freelance interpreters are more open or exposed to new technologies.

3.2.3. The post-interpreting phase

The survey respondents were asked to select all applicable responses that best describe their post-interpreting activities. The responses showed that 72.5 percent organise their glossary after interpreting, 46.5 percent review their performance to identify improvements and an equal percentage monitor their own performance based on self-recorded or publicly recorded videos or audio, and 16.5 percent create transcripts (Figure 12).
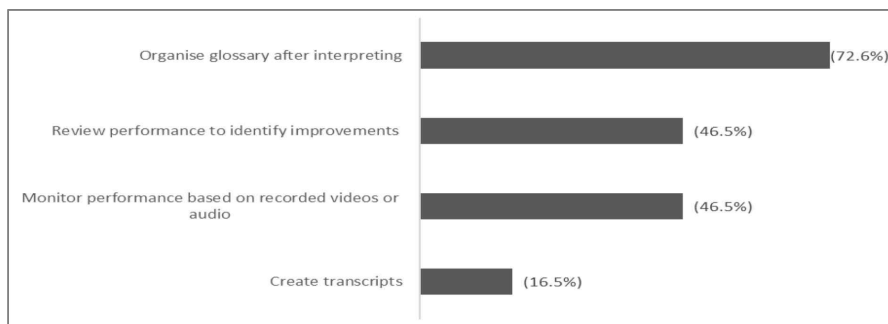

Figure 12. Post-interpreting Activity

The survey indicated that after completing an interpreting task, the Korean interpreters surveyed remain highly motivated to monitor and improve their own performance. These responses suggest that, in the future, transcriptions and glossaries might increasingly be organized using speech recognition tools and term management systems, respectively. On a final note, we asked for the respondents' thoughts on how offline simultaneous interpreting work environments may be improved. Apart from better ventilation in the booth (17.7%), better lighting and visibility (9%) and better desks and chairs (5%), better

sound quality was the top priority (68%) for most respondents.

This Chapter was dedicated to an analysis of the survey outcomes. The data presented will be further discussed in more depth in the next Chapter.

4. Discussion

The outcomes of the survey raise several topics for discussion. The first is terminology management. The study found that interpreters continue to use general-purpose office tools such as Word and Excel to organise their glossaries. When preparing for interpreting, they mainly use paper along with video and audio materials available on the web, and about half use handwriting on sticky notes. Meanwhile, terminology management tools developed in Europe such as InterpretBank and Interpreters' Help are rarely used. These findings echo those of Corpas Pastor and Fern's (2016) survey, which reports that despite the availability of tools and applications, many interpreters still use paper or spreadsheets to store information and terminology. While technology and software have advanced in recent years, terminology management tools for interpreters have remained relatively unchanged, perhaps due to lack of exposure in schools and the field, costs of using the software, low awareness in the local market, lack of local tools and most of all, the availability and familiarity of existing general-purpose office programmes and cloud-based solutions.

The survey also found that some interpreters were in fact using CAT tools for translation and glossary maintenance. We believe this is a new trend because most graduate schools of translation and interpreting in Korea have added CAT courses in recent years. However, while solutions are becoming more accessible, only a small minority of our respondents replied that they use programs such as SDL Multiterm, Sketch Engine and BootCat for terminology extraction. Terminology management and extraction tools are considered efficient means to manage and organise terms but due to lack of training and awareness in Korea, they are apparently used very moderately. Considering these findings, local software for terminology management and more training for awareness and use seem necessary.

The findings also underscore the importance of high quality sound devices such as headphones and earphones, especially in the exponentially growing remote interpreting landscape. Freelancers prefer the more advanced USB microphones to those embedded in their earphones or headphones, and offered specific information about the brands they favour. Moreover, the emergence of remote conferences seems to have added occupational stress on interpreters (Sang 2020; Chang 2021) and that they are actively investing in sound equipment since sound quality is becoming ever more important. As for improvements in working conditions, the interpreters are most interested in seeing quality microphones used by speakers in online conferences, suggesting the need for the relevant awareness and prior communication among conference organisers and speakers.

The findings also reaffirm the need for close collaboration for handovers between interpreting partners during interpreting. Remote interpreting systems have been developed and are widely used in Europe and Japan, but rarely in Korea. Although further investigation is needed, the researchers suspect that this may be partly due to the burden of using paid services along with a general lack of awareness. While Zoom is convenient as a remote interpreting platform, it still lacked appropriate tools for handovers as of 2023. The findings here suggest that interpreters are exploring other ways to collaborate outside the platform, such as chatting applications, video calls, or renting shared offices. Inferring from this, the development of collaboration tools in conferencing platforms will be very useful for interpreters.

Having discussed the implications of the findings, the next Chapter will summarise the outcome, along with the limitations and significance of the research.

5. Conclusions

The purpose of the survey of 200 active interpreters in Korea was to assess the status of their technology use in Korea as of 2023. The questionnaire that was administered to address the research questions was broken down into pre-interpreting, during interpreting and post-interpreting phases based on the categorization by Will (2020). Table 7 is a summary of all the tools mentioned in response to the first research question,

"How do interpreters utilise technology before, during and after interpreting?".

Table 7. Tools Mentioned in the Survey

Category	Tools
Hardware	Laptop, desktop, tablet, smartphone, voice recorder, electronic dictionary, whispering transceiver
Preparation	Web document, database, speech-to-text, text-to-speech, speech bank
Term management	Machine translation, CAT, cloud document tool, shared drives, office tools (Word, Excel, HWP, etc.), Notion, InterpretBank, Interpreters' help, MS OneNote, Sketch Engine, BootCat
Machine translation	Google Translate, Papago, DeepL, Baidu, Kakao Translation, MS PowerPoint built-in translation, ChatGPT
CAT	Trados, Memsource, MemoQ, SmartCat, Lokalise, Wordfast
Note-taking	GoodNotes, S Note, Samsung Note, Notability, Note shelf
Speech recognition	ClovaNote, Google (e.g. Google Docs, Google Translate), Otter, Microsoft (e.g. MS Word, PowerPoint), Bixby
RSI platform	Zoom, Teams, Webex, Knox, Google Meet, Whereby, Green Terp, Skype
Collaboration	KakaoTalk, built-in chatting on the platform, video call, instant messenger (e.g. Discord), phone, Slack
New technologies	AR glass, metaverse, voice recognition
Desired technologies	Text extraction functions such as numbers, proper nouns and technical terms based on speech recognition, real-time terminology search, better collaboration window with interpreting partners

As shown in Table 7, Korean interpreters have access to a wide range of tools and equipment. As in life and work in general, traditional devices are quickly being replaced by emerging ones in the interpreting field. As smartphones overlap with their functions, voice recorders and digital dictionaries are declining in popularity whereas wearables, note-taking apps and speech recognition are increasingly used.

According to this study, many interpreters already have speech recognition applications available on their personal devices such as laptops, tablets, and other mobile devices, which support their note-taking and transcription needs. While such systems are more common in Europe, it is now possible for interpreters to access speech-to-text extractions of specialised words and numbers during interpreting. As Korean interpreters expressed their needs for such functions, it appears that there is some market demand for

such solutions in the Korean market.

Secondly, the study examined whether technology use is affected by the respondents' attributes. Apparently, age did not influence whether interpreters preferred to print their materials, and we found that machine translation is used quite significantly across all attributes, mainly to translate conference materials provided in languages other than the interpreters' working languages, mostly by non-English interpreters (Korean-Japanese, Korean-Chinese). More freelancers use CAT, digital glossaries and non-paper note-taking tools, and they tend to use more sophisticated devices that affect sound quality, such as external microphones with USB connections and telepresence tools optimised for simultaneous interpreting. A follow-up study may be needed to confirm whether and why freelancers are more adept to new technologies. However, the responses related to the third research question suggest that the interpreters have a high demand for high-quality microphones to be used by individual speakers, speech-to-text displays of special speech elements, and collaboration tools.

This study is meaningful as the first of its kind conducted by KATI to take stock of technology use by active interpreters in Korea. With responses collected from some 200 interpreters as respondents, it is also larger than prior research in other parts of the world conducted among interpreters (Berber-Irabien 2010; Corpas Pastor and Fern 2016; Melinger and Hanson 2018). However, there are limitations to this study that should be supplemented through follow-up research. For example, as mentioned in Chapter 4, based on previous research (Corpas Pastor and Fern, 2016), we can speculate on the reasons why interpreters do not utilize tools such as glossaries. However, a deeper investigation is required to understand why interpreters in South Korea prefer paper notes and general word documents over glossary tools and why the use of laptops is more prevalent than tablets. Future studies may focus on tracking trends and conducting in-depth investigations to address these questions. Furthermore, although this study does represent the three major language combinations for interpreters in Korea, with the majority being Korean-English interpreters, it must be noted that most of the responses (69.5%) in this survey came from Korean-English interpreters. Therefore, the results may not represent the voice of all language interpreters in Korea. It would be useful to ensure linguistic balance for future research. Another significance of this study is that it

presents the status of technology use by interpreters as of early 2023, representing the status quo at a major turning point in technological innovation, as generative AI was just beginning to be widely distributed. Since it is predicted that CAI will undergo significant changes in 2024 and beyond, the researchers also note the critical need for follow-up surveys for reasons of historical record and comparison. Nevertheless, by analysing the status of technology use by this population of interpreters, the present study offers valuable insights into their utilisation of technology and working environments. A longitudinal study would be helpful for examining evolving trends. Our growing understanding of the technological needs of interpreters will enable us to provide support for the technological specifications that practicing interpreters prefer or will need in the future and contribute to developing standards for interpreter work environments.

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