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Exploring the acceptance of supporting tools in public service interpreting: a questionnaire study

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Present and future challenges for public service interpreting and translation: Interculturality, multilingualism & technologies

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Abstract

In the past two decades, the fast development of both communication and digital technologies has led to profound changes in how interpreting services are performed. Several studies have reported on how interpreters perceive and experience these technological changes and on interpreters' attitudes towards specific types of technologies in different interpreting sectors, such as *public service interpreting* or *PSI*. In this study, we focus on technologies which can support the interpreter' s preparation, performance and workflow of onsite interpreting assignments, in particular: machine translation tools, digital glossaries for manual term look-up, automatic terminology recognition tools based on speech recognition, note-taking apps and voice-recording tools. Our contribution aims to present the results of a survey into public service interpreters' use and acceptance of these types of technologies in the PSI sector.

Keywords: PSI; public service interpreting; survey; technology acceptance; CAI; ergonomics.

1. Introduction

Like many professional sectors, the interpreting sector is experiencing a growing technologisation and digitalisation of the profession. Nowadays, most simultaneous interpreting services are provided from booths, an infoport (bidule) system, apps, and online platforms. Remote interpreting is also very popular for other modalities, mainly bilateral interpreting (Ruiz Mezcua, 2018).

Braun (2019) distinguishes four types of interpreting-related technologies: (1) technologies used to deliver interpreting services, which allow technology-mediated or distance (remote) interpreting; (2) tools that support the interpreter's preparation, performance and workflow, i.e., tools facilitating technology-supported interpreting; (3) technologies aimed at replacing human interpreters, which promote technology-generated interpreting or machine interpreting, and, finally, (4) technologies enabling hybrid modalities such as respeaking.

The scope of this contribution is the second type of interpreting-related technology, i.e., technology-supported interpreting, which we will study in the context of *public service interpreting* (abbreviated as *PSI*). Although many different labels are used to refer to this form of interpreting in PSI-related research (Tipton and Furmanek, 2016: 2-7), in this paper, we will use the general term *public service interpreting* to denote all interpreting practices in community-based organisations and public services (justice, health, education and social care).

PSI presents particular characteristics that may impact the use of technology as it takes place in natural, dialogic contexts, where interpreters endorse a more visible and interactive role than in other modalities, such as conference interpreting. Furthermore, several authors have already pointed out the coordinating role of interpreters (Wadensjö, 1998), which implies an extra effort for them, who have to deal with conversational aspects of language, such as non-verbal (e.g., proxemics, body language, posture, and facial expression) and paraverbal (e.g., volume, speed, intonation, emotion) communication. PSI is generally interactive: discourse and meaning are co-constructed by all the participants in the interaction, including the interpreter, who is also responsible for processing pragmatic meaning, usually linked to cultural diversity. This cognitive load and the fact that, unlike conference interpreters, PSIs work alone (Hale, 2007) entail that little cognitive capacity and time remains for using technology during assignments, as this implies adding effort to the already complex interpreting process. Costa and others (2014) acknowledge that tools for interpreters seem to be more successful if designed for the preparation phase, particularly considering that most interpreting assignments are delivered onsite.

The present study will look into public service interpreters' use and acceptance of supporting interpreting technologies (some of them computer-assisted interpreting or CAI tools). Within the scope of the study, attention is given to the following technologies: machine

translation technologies, digitally available glossaries for manual term look-up, speech-to-text technology (e.g., for automatic term recognition and transcription), note-taking apps, and voice-recording tools.

In section 2, we first provide an overview of interpreting-oriented studies addressing the topic of technology. As this study focuses on technology acceptance, we first discuss how this concept will be operationalised (see section 3). We then set out the research questions and explain the methodology (see section 4). Findings from the study are presented in section 5 and discussed in more detail in section 6. Finally, a conclusion follows in section 7, as well as thoughts on further research.

2. Literature on technology and interpreting

Several aspects are considered in the literature on technology and interpreting. For example, some studies focus on actual technology use by interpreters and are usually exploratory and/or survey-based. See, e.g., Corpas Pastor and Fern (2016), Mellinger and Hanson (2018), Kerremans and others (2019) or Corpas Pastor and Gaber (2020). Other studies on interpreting and technology focus on the technology used in learning contexts or during simulated interpreting assignments. See, e.g., Orlando (2015), Sandrelli (2015), Kellett Bidoli and Varde (2016), Rangel da Silva Firmino (2016), Sánchez Ramos (2017a) or Desmet and others (2018). There are also studies on interpreting and technology that focus on different types of technologies and how they can be helpful for interpreters. Examples are instant messaging apps (Adams, 2021), corpus analysis tools (Costa and others, 2014; Fantinuoli, 2016; Sánchez Ramos, 2017b), remote interpreting tools (Jaime Pérez, 2015; Devaux, 2018; De Boe, 2019; Amato, 2020; Corpas Pastor and Gaber, 2020; Lázaro Gutiérrez, 2021), note-taking technologies (Costa and others, 2014; Goldsmith, 2018), terminology management systems (Costa and others, 2014; Fantinuoli, 2016, 2017b) or speech technologies, such as automatic speech recognition or speech-to-text (Fantinuoli, 2017a; Schild Ortiz and Cavallo, 2018; De Cotret and others, 2020; Gaber and others, 2020).

For space reasons, we will only zoom in on the first group of studies (cf. supra) in which our piece of research can also be positioned as it aims to gauge the use and acceptance of technology by professional PSIs in authentic assignments. In this group of studies—to the best of our knowledge—there is rarely an exclusive interest in PSIs. Corpas Pastor and Fern's study (2016), for instance, includes liaison interpreters practising in various contexts, including public service interpreters, and focuses on their technological needs, use of technologies and reasons for (not) using them. In the case of liaison interpreting, they found that the usual lack of briefing in this modality makes it difficult for interpreters to prepare in advance, although interpreters indicated they use online dictionaries, glossaries, thesauri and other web-based resources during the preparation phase of interpreting assignments. During the interpreting performance, more than half of the 133 respondents in the study

did not use any technological tool or resource. Others used their laptops, tablets or mobile phones to browse resources for isolated terms and words. Other tools, such as note-taking instruments, were not commonly used, although interpreters believe they may be useful.

Mellinger and Hanson (2018) looked at the use and adoption of technologies in conference and community interpreting settings. Their web-based survey used a variety of existing survey instrument scales to determine whether interpreters' use of technology in both interpreting contexts is influenced by the demands of their profession, the ethics and norms of their profession, their personality traits, or a combination of these factors.

Previous studies show that awareness about the benefits of using technology is spreading, although some studies have reported a low uptake among interpreters to use technology (Corpas Pastor and Fern, 2016; Corpas Pastor, 2018; Kerremans and others, 2019). This may be due to a variety of reasons. On the one hand, the emergence of remote interpreting and the introduction of CAI or other supporting tools implies not only the requirement of new skills but is also bringing about a profound change in interpreters' working conditions (e.g., diverse ways of organising and performing assignments, and a different system for fees and payments) or ergonomics (i.e., the interaction of interpreters with the work system) (Dong and Turner, 2016). This change may cause stress and anxiety in individual interpreters and deep concerns to professional associations (Lázaro Gutiérrez, 2021). Given this context, it is essential to consider how CAI and other supporting technologies affect interpreting performance in public settings. To this end, this study will examine public service interpreters' perceptions and acceptance of these technologies.

3. Technology acceptance

Acceptance of technology is a precondition for implementing and using technology in the workplace. A technological tool may not, or to a lesser extent, be used today but may already have a certain degree of acceptance, making a user more prepared to use the technology in the future. This study, therefore, explores the usage potential of technologies that can support public service interpreters.

To operationalise the theoretical construct of *technology acceptance*, we base ourselves on the Technology Acceptance Model (TAM), which was first proposed in the ICT community by Davis (1989) and later extended in several studies, such as the ones by Venkatesh (2000) and Venkatesh and Davis (2000), adding external variables affecting behavioural determinants. TAM models how users come to accept and use technology. Various external factors may influence the extent to which a user thinks that using the technology leads to better job performance, i.e., the perceived usefulness or PU. Other variables may impact the extent to which a user feels about the required effort or skills to use the technology, i.e., the perceived ease of use or PEOU. Both PU and PEOU are posited as internal behavioural de-

terminants, which tend to be influenced by external variables. Together, they determine the behavioural intention to use the technology (BI), which will determine actual system use.

4. Research questions and methodology

The present study addresses the following research questions:

RQ1: To what extent do public service interpreters make use of supporting tools (i.e., machine translation tools, digital glossaries for manual term look-up, term recognition based on speech recognition or SR, note-taking apps and/or voice recorders) to assist them in the preparation or the delivery of their interpreting assignments?

RQ2: What is the user's acceptance of these technologies?

RQ3: What are the reason(s) non-users give for not using the technologies?

To answer these research questions, we conducted an online questionnaire study over a period of three months in 2021. The questionnaire was designed in English using the online survey tool *Qualtrics* and contained closed questions (multiple choice or multiple answers type) and a limited number of open-ended questions to add specifications or comments. Two professional public service interpreters from Spain tested a pilot version to check the questionnaire's look and content validity and verify whether the questionnaire was clear and accessible to non-native English speakers.

The invitation to participate in the study containing the link to the online questionnaire was distributed through different mailing lists, including the *European Network for Public Service Interpreting* (ENPSIT), PSI organisations in Belgium, France, Germany and the Netherlands, interpreting companies in Spain, the European Commission's *Knowledge Centre on Interpretation* (KCI), and the international training agency in the United States for medical and community interpreting *Cross-Cultural Communications* (CCC). The questionnaire was also spread informally by colleague scholars and interpreters, who distributed the survey link through academic and professional networks in South America, Africa, Australia, New Zealand and Asia.

The questionnaire comprised three sections. The first section aimed to collect respondents' demographic data and professional backgrounds (nationality, working languages, country where activities occur, fields of expertise, formal training, etc.). The questions in the second section focused on the frequency of use, the fields of expertise in which the respondents use the technologies, and how they use them in terms of platforms or systems, etc.

Finally, the questions included in the third section were designed to gauge the users' acceptance of the supporting interpreting tools, more specifically in terms of perceived use-

fulness (PU), perceived ease of use (PEOU) and behavioural intention (BI). As is customary in TAM-based studies, the model's constructs were captured using a five-point Likert scale method, including ten items (four for PU, four for PEOU and two for BI). This part of the questionnaire was limited to ten items to control the questionnaire for length. The TAM components were adapted from Davis' (1989) scale items and tailored to fit the PSI context, i.e., to capture relevant perceptions in PSI contexts. The perceived usefulness (PU) and the perceived ease of use (PEOU) components were measured through four statements each:

1. *I believe using this technology improves my job performance.* (PU)
2. *I believe using this technology makes it easier to do my job.* (PU)
3. *I believe using this technology improves my productivity.* (PU)
4. *I believe using this technology is useful in my job.* (PU)
5. *I like using this technology.* (PEOU)
6. *I feel comfortable using this technology.* (PEOU)
7. *It is easy to become skilful at using this technology.* (PEOU)
8. *This technology is controllable.* (PEOU)

The behavioural intention (BI) dimension was measured through two statements:

1. *I will likely continue to make use of this technology in the future.* (BI)
2. *I would love to continue to use this technology in the future.* (BI)

Participants were asked to rate each statement based on a five-point Likert scale with the following options: 1 = *I strongly disagree*, *2 = I tend to disagree*, *3 = I am undecided*, *4 = I tend to agree*, *5 = I strongly agree*.

Both in sections 2 and 3 of the survey, participants were presented with questions for each supporting tool separately. After completing section 3 of the survey, users were allowed to add additional comments on the possibility or the difficulty of using the tool(s).

On the other hand, participants who indicated they were not using a particular tool were not presented with sections 2 and 3 but were instead presented with a parallel section in which they were asked to provide the reason(s) why they did not use the technology using a multiple answer question which they could complement with additional reasons:

- *I do not feel comfortable using this technology.*
- *I do not have the need to use it.*
- *I have never learned to use this technology, so I do not know how to use it.*

- *The organisation(s) I work for do(es) not favour the use of this technology*
- *Other*

The following section presents an overview of respondents' demographic and professional profiles and then reports on their use and acceptance of the aforementioned supporting interpreting tools. We analysed the data of 61 participants who had completed the whole survey.

5. Results

5.1. Demographic and professional profiles

The 61 respondents in our questionnaire included 38 females, 22 males and 1 participant of unspecified gender. They included respondents from a wide variety of nationalities, 33 countries and 5 different continents. All age groups were represented, although most respondents (20 or 32.79 %) were aged 56 or more. Respondents performed their professional activities in a wide variety of countries, such as Australia (15), Belgium (15), the USA (11), Sweden (6), Germany (3), Spain (3), China (2), Italy (2), United Kingdom (2), Austria (1), France (1), Iran (1), Israel (1), Norway (1), Poland (1), Portugal (1), Thailand (1), Venezuela (1). Their (active and passive) working languages included no fewer than 36 different languages, including (in alphabetical order): Arabic (4), Berber (1), Bosnian (1), Bulgarian (3), Catalan (1), Chichewa (1), Chinese (3), Croatian (2), Cypriot Greek (1), Dutch (14), English (50), French (20), German (6), Greek (3), Hungarian (2), Indonesian (1), Italian (5), Korean (1), Macedonian (1), Malay (1), Norwegian (1), Persian (3), Polish (1), Portuguese (4), Russian (3), Serbian (1), Slovenian (1), Spanish (12), Swedish (6), Turkish (3), Urdu (1) and Vietnamese (2).

Our data also included the responses of five sign language interpreters from various parts of the world mastering one or more sign languages, such as International Sign, American Sign Language, Australian Sign Language and South African Sign Language. Most respondents are experienced interpreters: 50.82 % have more than ten years of experience, 22.95 % are interpreters with 1-5 years of experience, and 18.03 % have 6-10 years of experience. Only five respondents (8.20 %) have been performing PSI assignments for less than one year.

A vast majority of respondents (80.33 %) reported working as freelancers or employees for interpreting companies or agencies providing interpreting services to public organisations and/or for (a) public service organisation(s) (in 31.15 % of the cases).

More than half of the respondents do not have PSI as their primary professional activity, as 9.84 % spend less than 50 %, 14.75 % less than 30 %, and 29.51 % less than 10 % of their activity practising PSI. On the other hand, PSI assignments make up most of the professional activity of a considerable proportion of respondents, with 29.51 % (18) of the respondents spending more than 70 % of their activity performing PSI assignments and 16.39 % (10) more than 50 %.

Respondents' interpreting activities take place in different PSI contexts: judicial, legal, court and police (65.57 %), health and medical (also 65.57 %), social and educational (72.13 %), and asylum and migration (42.62 %). Many respondents were active in non-PSI fields as well, such as business and financial interpreting (40.98 %) and other fields (19.67 %), including (international) conferences and meetings, science, tourism, technical interpreting, arts, religious or faith-related interpreting.

Almost 82 % (50) of the respondents had enjoyed formal training in interpreting, 72 % (36) of which included PSI. An overview of the 61 respondents' backgrounds is provided in table 1.

TABLE 1

Overview of respondents' demographic and professional profiles

NUMBER OF PARTICIPANTS	61
GENDER	· 38 females · 22 males · 1 not specified
AGE	All age groups represented
NUMBER OF WORKING LANGUAGES	36
NUMBER OF COUNTRIES WHERE PSI ACTIVITIES ARE PERFORMED	33
FIELDS OF EXPERTISE	· Judicial/legal/court · Health/medical · Social and educational · Asylum and migration · Other (non-PSI) fields
PROFESSIONAL EXPERIENCE	· Only 8.20 % less than 1 year · PSI not (always) main interpreting activity
FORMAL TRAINING	82 % of participants

5.2. Use of supporting tools

5.2.1. Use of supporting tools during preparation

As mentioned in section 4, respondents were first asked whether they used any technological tools to support them in the preparation of interpreting assignments. Only a little less than 70 % claimed to do so. Their specifications indicated they mainly resort to terminology tools (for terminological preparation), such as online glossaries from trusted sources or organisations, personal databases, bilingual dictionaries, and machine translation tools

(mainly Google Translate, followed by DeepL) for terminological look-up. Only four respondents mentioned terminology extraction tools (e.g., Interpretbank).

TABLE 2

Respondents using supporting tools when preparing for an interpreting assignment

USE OF SUPPORTING TOOLS FOR PREPARATION		
Yes	42	68.85 %
No	19	31.15 %

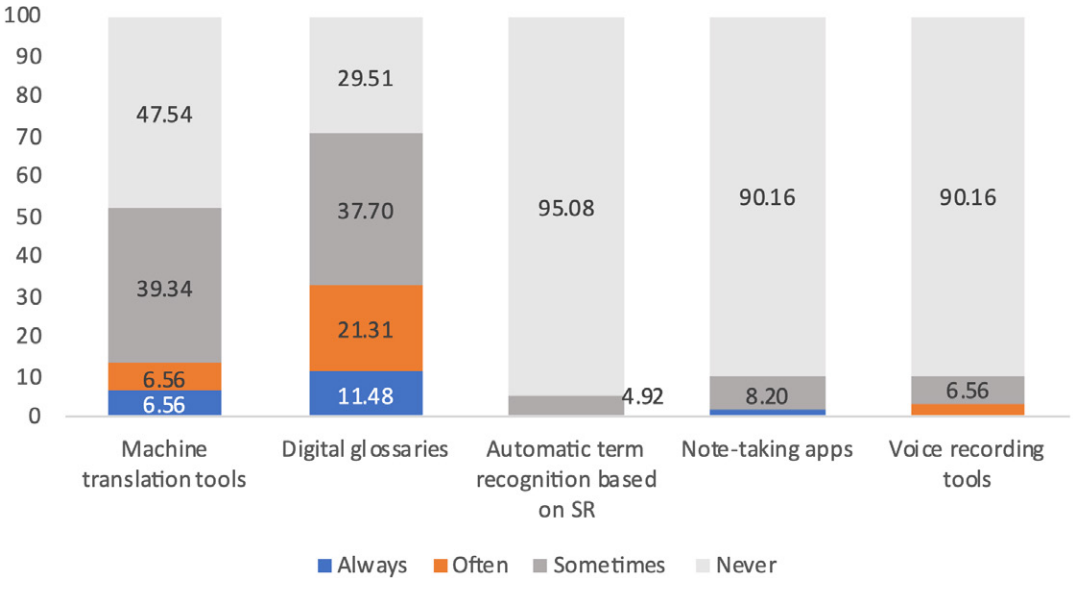
Although it was not a specific research question, respondents were also asked to indicate on which device(s) they usually used the reported supporting tools. Most respondents mentioned a laptop, followed by the desktop computer, and to a lower degree, the smartphone and/or tablet.

5.2.2. Use of supporting tools during interpretation

Consequently, respondents were asked to indicate to what extent they use the different supporting tools (i.e., machine translation tools, digital glossaries, automatic term recognition tools based on SR, note-taking apps and voice-recording tools) using a multiple choice question in which they could choose from four degrees of frequency (*Never*, *Sometimes*, *Often* or *Always*). Figure 1 presents an overview of respondents' answers.

FIGURE 1

Supporting tools frequency of use

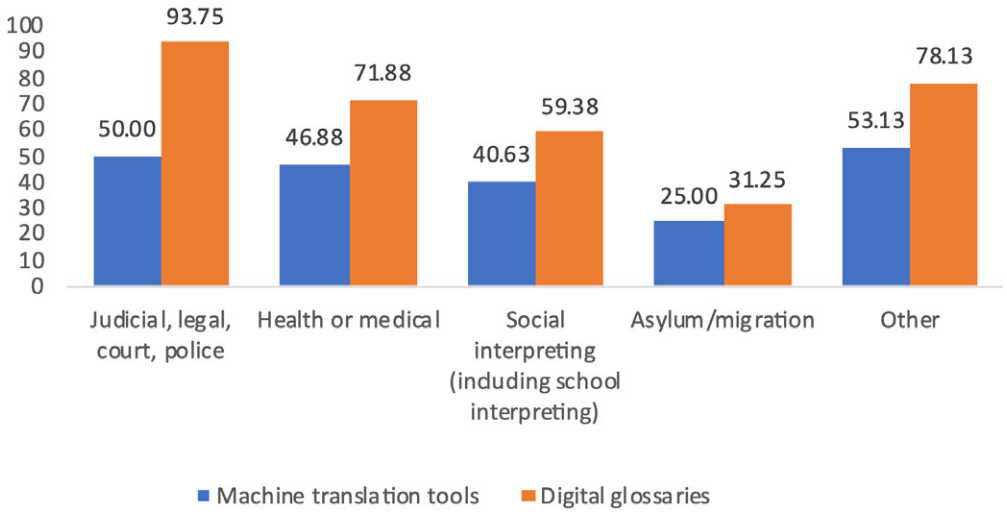


Two technologies, i.e., digital glossaries and machine translation tools, turned out to be used by most respondents, with percentages of 70.49 % (43 respondents) and 52.46 % (32 respondents), respectively. In the case of digital glossaries, respondents indicated they sometimes use them in 37.70 % of the cases. A somewhat lower proportion of 21.31 % uses them often, and an even lower percentage (11.48 %) of them indicated they always use such (a) tool(s). On the other hand, machine translation tools were sometimes used by 39.34 % of the respondents. Only 6.56 % claimed to use these tools regularly, and the same percentage indicated they always resort to these tools when delivering an interpreting assignment. In other words, respondents are generally more inclined to resort to digital glossaries than to machine translation tools for manual term look-up. In both cases, a low percentage indicates always using the tools. The other supporting tools turned out to be used by only very few respondents: three respondents said they sometimes use (an) automatic term recognition tool(s) based on SR. 6 respondents used note-taking apps and voice-recording tools: note-taking apps were sometimes used by five respondents and always by one respondent, while four voice-recording tool users indicated *sometimes* and two users selected the *often* option.

Supporting tool users indicated in which fields they used the tools using a multiple-answer question. Figure 2 shows the distribution of the two supporting tools generating the most data, i.e., digital glossaries and machine translation tools, over the different PSI fields.

FIGURE 2

Use of digital glossaries and machine translation tools over different PSI fields



Both tools are used in all PSI fields, although to different degrees, as digital glossaries are used by more respondents than machine translation tools. Both tools seem to be used mainly in the judicial/legal/court, the health/medical and the social interpreting contexts.

Although not remotely representative, the data for the other supporting tools reveal that the few respondents using these tools reported doing so in all PSI fields. Only voice-recording tools were found not to be used in asylum/migration contexts. The *other* category reflects additional (non-PSI) fields in which respondents are active in as interpreters and include business/financial interpreting, tourism interpreting, conference interpreting, etc.

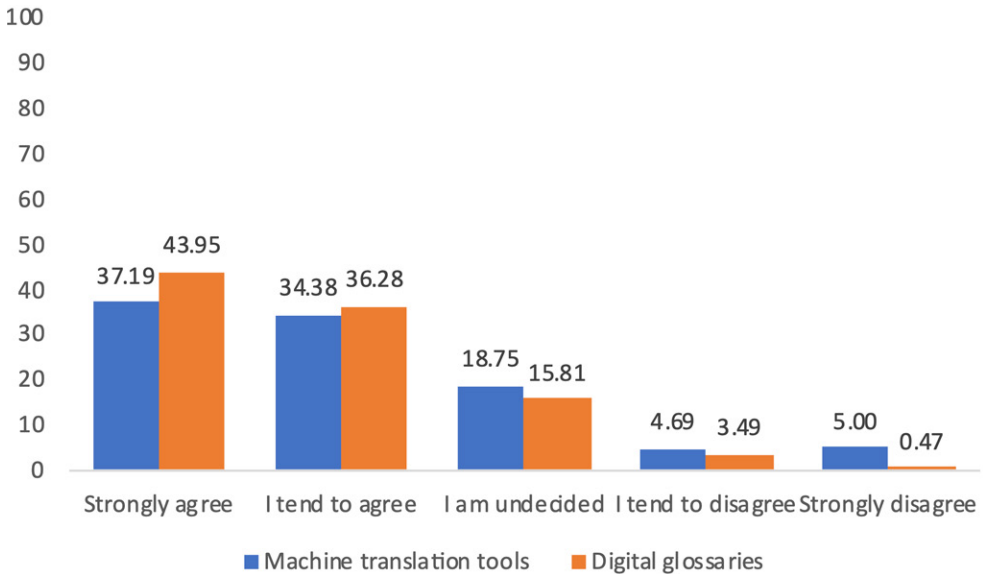
Only two machine translation tools were mentioned, i.e., *Google Translate* and *DeepL*. Digital glossaries include bilingual dictionaries, personal databases, and online glossaries from trusted sources or organisations. These tools are mainly used on a laptop, a desktop computer, and to a lower extent, on a smartphone or a tablet. The only term recognition tool based on automatic SR mentioned was *Interpretbank*, which was used both on a laptop and a desktop computer. The mentioned note-taking apps included *Evernote*, *OneNote*, *Samsung note* and pre-installed note-taking apps, which are used on a tablet, a smartphone or a laptop with a touch screen, in some cases using a stylus or a smartpen. The voice-recording tools included apps pre-installed on the smartphone, laptop, desktop computer, and/or tablet, or even a dictaphone or *IflyTek* technology (which incorporates speech recognition and automatic translation).

5.3. Acceptance of supporting tools

Before turning to the results of the three operationalised TAM components, figure 3 presents an overview of respondents' general acceptance ratings by adding up the ratings in all TAM constructs. Again, the figure is limited to the two technologies used by a more representative proportion of respondents.

FIGURE 3

Acceptance of machine translation tools and digital glossaries



Respondents' acceptance ratings are mainly (partially) positive for machine translation tools (71.57 %) and digital glossaries (80.23 %), whereas in both cases, less than 20 % of the ratings is neutral, and a low percentage of ratings is (partially) negative.

In the case of automatic term extraction based on SR, the three users chose the *Undecided* option on all acceptance items. The six note-taking app users selected neutral and (partially) positive ratings, as did the voice-recording users, which nevertheless also yielded two partially negative ratings.

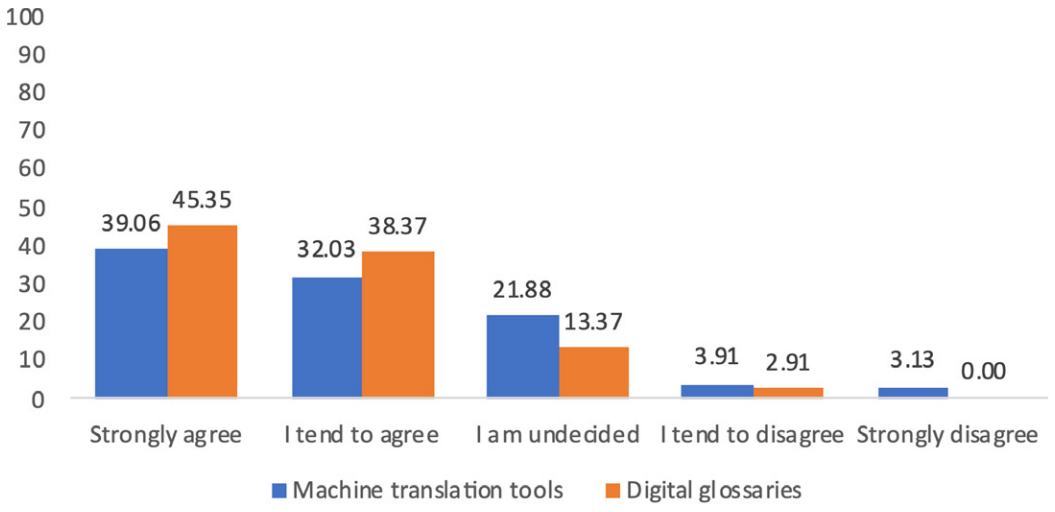
The following sections present the ratings for each TAM construct, i.e., PU, PEOU and BI, separately.

5.3.1. Perceived usefulness

As explained in section 3, to measure the perceived usefulness, participants were invited to rate four items to capture respondents' perceptions of the usefulness of the supporting tools in a PSI context.

FIGURE 4

Perceived usefulness ratings for machine translation tools and digital glossaries



The tendency here is not very different from the general acceptance shown in the previous section, with both machine translation tools (MT) and digital glossaries (DG) yielding a vast majority of (partially) positive (71.09 % for MT and 83.72 % for DG), and a lower proportion of neutral ratings (21.88 % for MT and 13.37 % for DG). The three users of automatic term extraction based on SR only indicated the *undecided* option. The six note-taking app users mainly chose the *I tend to agree* option or neutral or strongly agreed with the presented PU usefulness statements. Finally, the six voice-recording users strongly agreed with the statements or were undecided on the tools' usefulness.

The mean ratings of the different PU statements for machine translation tools and digital glossaries shown in table 3 reveal that, while users tend to find machine translation tools helpful in their jobs, they are less inclined to believe they improve their job performance.

TABLE 3

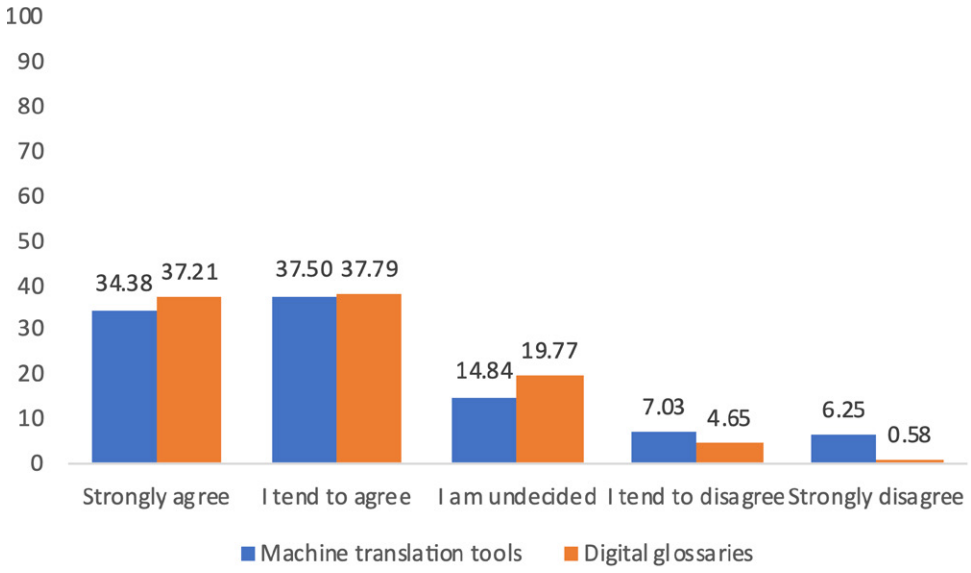
Mean ratings of PU statements for machine translation tools (MT) and digital glossaries (DG)

	MT	DG
improves my job performance	3.84 (1.19)	4.23 (0.84)
makes it easier to do my job	4.09 (0.93)	4.30 (0.71)
improves my productivity	3.91 (1.03)	4.16 (0.87)
useful in my job	4.16 (0.95)	4.35 (0.78)

5.3.2. Perceived ease of use

FIGURE 5

Perceived ease of use of machine translation tools and digital glossaries



Here as well, the perceived ease of use ratings given by users of machine translation tools and digital glossaries were again primarily (partially) positive (71.88 % for MT and 75 % for DG) or neutral (14.84 % for MT and 19.77 % for DG). The three users of automatic term extraction based on SR only indicated the *undecided* option. The six note-taking app users mainly chose the *I tend to agree* option (50 % of all ratings), were undecided, or strongly

agreed with the presented ease of use statements (25 % of the ratings in both cases). Finally, the six voice-recording users strongly or partially agree with the statements or are undecided on the tools' ease of use.

The mean ratings of the different PEOU statements for machine translation tools and digital glossaries in table 4 show that, in both cases, users tend to have more doubts about the degree to which the tools are controllable.

TABLE 4

Mean ratings of PEOU statements for machine translation tools (MT) and digital glossaries (DG)

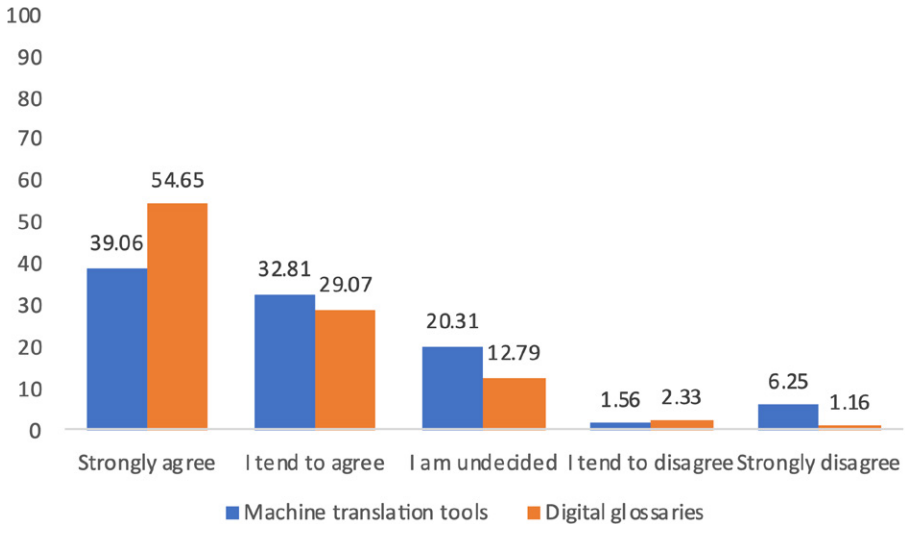
	MT	DG
like using	3.97 (1.23)	4.16 (0.92)
feel comfortable using	3.91 (1.20)	4.35 (0.75)
easy to become skilful at using	4.00 (0.95)	3.95 (0.97)
controllable	3.59 (1.21)	3.79 (0.86)

5.3.3. Behavioural intention

This construct was measured using statements 9 and 10 (see section 4). An overview of participants' ratings of these two statements for machine translation tools and digital glossaries is shown in figure 6.

FIGURE 6

Behavioural intention ratings for machine translation tools and digital glossaries



Both tools yield (partially) positive ratings (71.87 % for MT and 83.72 % for DG). More than half (54.65 %) of all digital glossary users strongly agree with the behavioural intention statements. A lower proportion of ratings is neutral (20.31 % for MT and 12.79 % for DG), and very few are (partially) negative. All three users of automatic term recognition tools based on SR indicated that they were undecided in their intention to use such (a) tool(s) in the future. The proportion of neutral ratings for note-taking apps and voice-recording tools was also the highest (42 % in both cases), while the remaining users tended to agree or strongly agree with the statements.

As can be seen in table 5, presenting the mean of the BI ratings for machine translation tools and digital glossaries, machine translation users tend to state that they are likely to continue using them in the future, although they are not all necessarily looking forward to it.

TABLE 5

Average ratings of BI statements or machine translation tools (MT) and digital glossaries (DG)

	MT	DG
likely use in the future	4.16 (0.81)	4.47 (0.70)
I would love to use it in the future	3.78 (1.34)	4.21 (1.01)

After rating the acceptance items for a supporting tool, users were invited to provide additional comments on the possibility or difficulty of using that specific tool in PSI contexts. Unfortunately, only very few comments were entered in the case of machine translation tools and digital glossaries. In their additional comments, users raised concerns about the tools' quality and the difficulty of using the tools while performing the interpreting activity, e.g.:

> *Machine translation is something I use on rare occasions for things I can't find anywhere else. Usually, the results are pretty bad, but sometimes it can jog your memory or give you a new avenue of approach to pursue.* (quality)
>
> *You have to know the subject matter to determine which of the many alternatives/entries are correct. There are a lot of errors in these types of resources. I generally prefer to use my own word lists.* (quality)
>
> *It is not exactly easy listening to someone and looking up a word simultaneously. I do it only if necessary.* (ergonomics)

5.4. Reasons for not using supporting tools

Participants who were not using a specific supporting tool were required to indicate reasons in a multiple-answer question (see section 4). Non-users were also allowed to

specify (an)other reason(s) by selecting the *other* option. Respondents' selected answers are summarised in table 6.

TABLE 6

Overview of reasons selected by non-users

	MT (N=29)	DG (N=18)	ATR (N=58)	NTA (N=55)	VR (N=55)
Not comfortable with it	17.24	0.00	1.72	3.64	7.27
Difficult to control	6.90	0.00	0.00	1.82	3.64
Not learned to use	6.90	27.78	36.21	36.36	27.27
Do not know	6.90	5.56	36.21	34.55	20.00
Do not need	44.83	44.44	25.86	32.73	43.64
Not available in my language(s)	10.34	11.11	5.17	5.45	0.00
Not allowed to use	3.45	22.22	15.52	7.27	21.82
Other	31.03	5.56	8.62	10.91	16.36

(Machine translation tools = MT; Digital glossaries = DG; Automatic term recognition tools based on SR (ATR); note-taking apps (NTA); Voice-recording tools = VR).

In the case of Machine translation tools, the most recurring answers were *I do not have the need to use it* (44.83 %) and *I do not feel comfortable using it* (17.24 %). Digital glossaries were found unnecessary in 44.44 % of the cases, or non-users have never learned to use them (27.78 % of the cases). The organisation(s) non-users work for do(es) not favour using digital glossaries in 22.22 % of the cases.

The most frequent reasons given by non-users of automatic term recognition tools based on SR are that they have never learned to use such a tool (36.21 %) or do not know this technology (36.21 %). In 25.86 % of the cases, non-users do not need this technology. These are also the most frequently selected reasons for not using note-taking apps, with percentages of 36.36 %, 32.20 % and 32.73 %, respectively.

Voice recorders are not needed in 43.64 % of the cases, and a fair proportion of non-users have never learned to use (27.27 %) them. Around one-fifth of non-users claim not to know this technology, and/or the organisation(s) they work for do(es) not favour using these tools.

Table 7 offers an overview of the reasons selected by (more than) 20 % of non-users per supporting tool.

TABLE 7

Overview of the reasons selected by 20 % or more of non-users per tool

Not learned to use		DG	ATR	NTA	VR
Do not know			ATR	NTA	VR
Do not need	MT	DG	ATR	NTA	VR
Not allowed to use		DG			VR
Other	MT				

The specified reasons given by non-users who selected the *other* options included quality and ergonomic concerns (e.g., distracting, no time) in the case of Machine translation tools and Digital glossaries, e.g.:

> *I find it unreliable, of poor quality.* (quality)
>
> *This technology is only useful for repetitive, highly-formatted tasks. It can only handle things that have been successfully translated before by human translators and then only by plagiarising the pre-existing translations. The things an experienced public service interpreter needs to research or think about are not of that nature.* (quality)
>
> *Community simultaneous interpreting doesn' t give me time to do this. I need my eyes fully on the screen for visual information.* (ergonomics)
>
> *I don't trust the solutions they offer, and it is distracting from the task at hand.* (quality and ergonomics)

The principal alternative reasons given by non-users of automatic term recognition tools based on SR included organisational policy and ergonomic issues, e.g.:

> *I suppose that this wouldn't be allowed at the court and other juridical settings.* (organisational policy)
>
> *Using this technology would involve interrupting oral interpretation.* (ergonomics)
>
> *I believe this technology would require an internet connection, which is unavailable to me (prohibited by the policy of an end-user agency) in certain settings such as prisons and remand custody centres. Therefore I would not wish to become reliant on such technology.* (organisational policy)

Note-taking apps were not used because some non-users prefer to take notes manually, because of the organisational policy and/or for ergonomic reasons, e.g.:

I prefer to take notes manually (preference)

I cannot use them while interpreting (ergonomics)

Issues at the National court for Asylum: only pen and paper is allowed. Notes have to be destroyed at the end of the hearing. (organisational policy)

Finally, the specified alternative reasons for not using voice-recording tools almost only relate to the breach of confidentiality and organisational policy, e.g.:

It would violate professional confidentiality. (confidentiality)

I would guess that's illegal, privacy protection etc. (confidentiality)

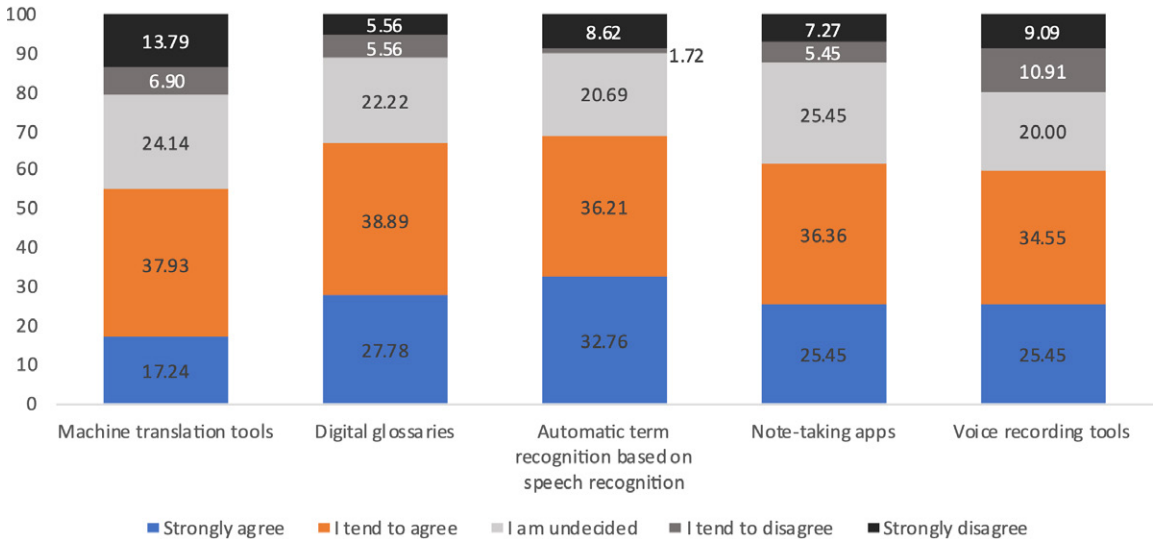
It is not permitted where I work. (organisational policy)

5.5. Willingness to learn about supporting tools

As mentioned in section 4, respondents without experience in using (a) specific supporting tool(s) were asked to rate (on a five-point Likert scale) the extent to which they would nevertheless be interested in knowing more about how the supporting tool(s) could support them as public service interpreters. An overview of their ratings is presented in figure 7.

FIGURE 7

Willingness to learn about the supporting tools



More than half of the respondents are willing to know more about the role of the different technologies in PSI. However, between 20 % and 26 % are undecided on this matter, while

a lower proportion of non-users claims not to be (very) interested to know more about the supporting tools' potential in PSI contexts.

6. Discussion

In this study, we aimed to answer several research questions related to the use and acceptance of supporting tools by public service interpreters, more specifically:

RQ1: To what extent do public service interpreters make use of supporting tools (i.e., machine translation tools, digital glossaries for manual term look-up, term recognition based on speech recognition or SR, note-taking apps and/or voice recorders) to assist them in the preparation or the delivery of their interpreting assignments?

RQ2: What is the user's acceptance of these technologies?

RQ3: What are the reason(s) non-users give for not using the technologies?

Our results are based on the responses of 61 (mainly experienced) respondents performing PSI activities in different fields of expertise in 33 different countries.

6.1. Use of supporting tools

While 68.85 % of respondents stated that they used supporting tools to prepare their interpreting assignments, their answers show that they mainly resort to terminology tools (for terminological preparation), such as bilingual dictionaries and/or personal or official databases from trusted sources or organisations. Machine translation tools (*Google Translate* and *DeepL*) were also regularly used for terminological look-up. Terminology extraction tools, however, turned out to be used by very few respondents. This might be because PS interpreters are not usually provided with preparation materials that they can work with. This resonates with the results of Corpas Pastor and Fern (2016). The lack of briefing, as frequent as it is, can even be considered a characteristic of PSI assignments.

Respondents' answers relating to their use of supporting tools while delivering their interpreting tasks also reveal that more than half of them use these two tools, with percentages of 52.46 % for machine translation and a higher percentage of 70.49 % for digital glossaries. In both cases, most users only occasionally use the tools (39.34 % in the case of MT and 37.30 % in the case of DG) in all PSI fields, but especially in the judicial/legal/court, the health/medical and the social interpreting contexts. The other supporting tools, i.e., automatic term recognition based on SR, note-taking apps and voice recorders, turned out to be very limited, as very few respondents stated they used them and only did it occasionally.

6.2. Users' acceptance of supporting tools

In general, users have a favourable attitude towards both machine translation tools and digital glossaries, as acceptance ratings are mainly (partially) positive for machine translation tools (71.57 %) and digital glossaries (80.23 %). A lower proportion of acceptance ratings is neutral (18.75 % for machine translation tools and 15.81 % for digital glossaries), and an even lower proportion is not (at all) convinced by their potential to support interpreting assignments in PSI contexts. However, the degree of acceptance of the other supporting tools cannot be determined due to the limited number of users. A similar pattern is observed in each of the TAM constructs, i.e., PU, PEOU and BI. In all three categories, the statements' ratings for machine translation tools and digital glossaries are (partially) positive, and neutral ratings make up a lower proportion. Users' additional comments reveal that they (sometimes) use both supporting tools despite quality concerns and a potentially disruptive effect on their performance.

The three users of automatic term extraction based on SR almost only indicated the *undecided* option in the 3 TAM constructs. The ratings of the six note-taking app users are all (partially) positive or neutral, as are the ratings of the six voice recorder users (except for one PU and one PEOU rating, marked as '*I tend to disagree*').

6.3. Reasons for not using supporting tools

Many respondents feel they do not need the different supporting tool(s). Three of the technologies under scrutiny, i.e., automatic term recognition based on SR, note-taking apps and/or even voice recorders, are not known by a fair proportion of respondents. Another frequent reason is that they have never learned to use them. In many cases, the organisation (s) the interpreters work for do(es) not favour the use of digital glossaries and voice recorders.

Other reasons specified by non-users for machine translation tools and digital glossaries include concerns about the quality of the tools' output. Ergonomic issues are also mentioned in the case of automatic term recognition based on SR and note-taking apps. Organisational policy turned out to sometimes prevent the use of automatic term recognition based on SR, note-taking apps and voice recorders. The latter technology also elicited confidentiality concerns. This is particularly the case in settings where security is a priority, such as prisons or other legal institutions. These organisations forbid the use of any electronic devices.

Despite the obstacles or objections by non-users, more than 50 % of non-users are (partially) willing to know more about the specific tool(s), although between 20 and 26 % are undecided on this matter.

In other words, although there is (some) interest among a fair proportion of non-users, not all accept the supporting tools' potential in PSI contexts. The peculiarities of PSI, which

include interactive and unprepared communicative events, pose problems to the use of technology. Interpreters must manage conversational aspects of language, such as non-verbal (e.g., proxemics, body language, posture, and facial expression) and paraverbal (e.g., volume, speed, intonation, emotion) communication, which implies a high cognitive load. As mentioned before (see section 1), this gives as a result that little cognitive capacity and time remains for using technology during assignments.

PS interpreters' environment is ever-changing compared to conference interpreting settings. The policies and interaction rules of the many settings in which PS interpreters work are varied. Moreover, the traditional lack of briefing in PSI assignments makes it unsure whether interpreters will be allowed to use electronic devices (e.g., prohibition of using electronic devices in detention centres) or whether those will be accepted by other participants in the interaction (e.g., by a judge in court, by an asylum seeker during a hearing, etc.). For these reasons, interpreters might choose not to get acquainted with (or even be dependent on) technology, as shown in our data.

7. Conclusion and further research

The present study contributes to the body of research on the impact of interpreting-related technologies (in particular of supporting tools) by gauging public service interpreters' use and perceptions of specific supporting interpreting technologies, more precisely, machine translation tools, digital glossaries, automatic term recognition tools based on SR, note-taking apps and voice-recording tools. Our findings show that respondents are not using a wide range of supporting tools. Two technologies, i.e., machine translation tools and digital glossaries, stood out in terms of the number of users, both in the preparation of and as a support of interpreting tasks. The majority of these users, however, indicated only occasionally using these tools to support terminology work. More than half of the users have a (somewhat) positive attitude towards these technologies, although a considerable proportion of users is not convinced by the tools' potential to support PSI assignments. Moreover, several users expressed concern about the quality and the practical challenge of using these tools during the interpreting task.

The many interpreters who are not using supporting tools often have never learned to use the technology or feel that the technology is not needed in the specific settings in which they are interpreting. Many users do not know specific tools, especially for automatic term recognition based on SR, note-taking apps and voice recorders.

The fact that some of the supporting technologies are not or hardly used by PSIs is (partly) due to a lack of trust in the technologies, more specifically, concerns about the quality of the technologies and/or the breach of confidentiality, but also due to organisational policy and/or ergonomic issues, as the tools do not always seem to cater the specific working conditions of public service interpreters.

While there certainly is an interest among a slight majority of non-using interpreters to learn more about how the supporting technologies could be used in their PSI activities, a considerable proportion of non-users do not seem (very) interested to know more about the supporting tools. This might be because PSI, interpreters' (training) profiles are diverse, and some might not be tech-savvy enough to introduce technology in their current practice.

In sum, our findings suggest that using supporting tools is far from generalised among public service interpreters and that many have reservations about relying on these technologies in PSI contexts.

We know that our survey-based approach suffers from several limitations and should be complemented with more research to provide a conclusive answer regarding the impact of supporting technologies on PSI practices. For instance, self-reported usage and user perceptions do not measure actual usage or objective observations. Moreover, our findings are based on the data of a limited sample of public service interpreters from a wide variety of countries working in different contexts, which affects their generalisability.

Our study focuses on PSI interpreting fields which were quite broadly defined. Further research should zoom in on the specific technological needs and user perceptions within each concrete interpreting field or setting, as the needs of each context can be different in terms of preparation, quality requirements, interpreting mode and modality (onsite vs. remote), ergonomics, confidentiality requirements, deontology, etc. These factors can also differ in how PSI is organised in different countries. It would also be relevant to explore whether factors, such as working languages, (formal) tool training, etc., play a possible role in the attitudes towards supporting tools. Reasons for interpreters' attitudes towards technology are obviously also related to personal traits, as suggested in the study by Mellinger and Hanson (2018). The authors explain that interpreters' attitudes towards technology can, for instance, be partly due to the role interpreters assign themselves during a communicative event. For example, in specific settings, interpreters may choose to use technology to help maintain the appearance of invisibility, while, in other settings, they may be reluctant to use technology-mediated interpreting to avoid limiting interaction possibilities with their clients. As it is difficult to obtain such detailed information through a survey, quantitative data could be further complemented with data from qualitative interviews with PSIs to understand better why they view technology the way they do.

Moreover, a more fine-grained categorisation of the supporting tools could potentially unravel how the type of device, platform or application may influence user perceptions and acceptance. Further research involving a larger population of public service interpreters could potentially bring to the fore diverging ratings even within specific TAM constructs, thus offering a more in-depth understanding of users' technology acceptance.

Our data included the answers of five sign language interpreters, who sometimes indicated that specific supporting technologies were not conducive to visual language. Further research is warranted to examine the specific needs of sign language interpreters and how supporting tool developers could meet their specific working conditions.

The fact that there is some willingness to know more about the supporting tools is an indication that there are opportunities to introduce a range of supporting technologies in PSI settings, but further research should look into how these tools need to be developed to address the concerns mentioned by both users and non-users. Moreover, our study defined user acceptance of supporting interpreting technology from the interpreter's perspective. It would be relevant to look into clients' or employers' perceptions of support and their reasons for prohibiting or limiting the use of specific technological solutions for interpreters. Our study suggests an opportunity for professional interpreters' associations and tool developers to introduce the interpreting sector to supporting technologies and discuss possible challenges and how these can be addressed. This would allow organisations using interpretation services to implement policies to facilitate technology support during interpretation.

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