Unveiling the tech-savvy side of non-professional subtitlers: A survey study on fansub groups in China

Desvelar el lado tecnológico de los subtituladores no profesionales: Un estudio sobre grupos de *fansub* en China

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Abstract: This paper explores the profiles and technology awareness of non-professional subtitlers in China. Using a questionnaire, the study established the demographic profiles of 356 correspondents and obtained insights into their attitudes towards the adoption of technologies. The profiles show that Chinese fansub communities are dominated by Generation Z. Almost half of respondents have prior experience in translation training and identify themselves as 'lead users' of technologies. The main findings reveal that the non-professional subtitlers favour subtitling freeware and view technical skills as essential, with a general openness to adopting specialised subtitling technologies in the future. Although non-professional subtitlers exhibit optimism regarding the future use of language technologies, they find the current quality of machine translation (MT) and automatic speech recognition (ASR) inadequate. These insights contribute to a refined understanding of the Chinese fansub community and underscore the need for further improvements in subtitling technologies.

Keywords: Non-professional subtitlers; technology awareness; specialised subtitling technologies; language technologies.

Resumen: Este artículo explora los perfiles y la conciencia tecnológica de los subtituladores no profesionales en China. Utilizando un cuestionario, el estudio retrata sus perfiles demográficos y obtiene perspectivas sobre sus actitudes hacia la adopción de tecnologías a partir de 356 encuestados. Los perfiles muestran que las comunidades de *fansub* en China están dominadas por la Generación Z. Casi la mitad de los encuestados tienen experiencia previa en formación en traducción y se identifican como «usuarios avanzados» de tecnologías. Los principales hallazgos revelan que los subtituladores no profesionales prefieren el software gratuito de subtitulado y consideran las habilidades técnicas como esenciales, con una disposición general a adoptar tecnologías especializadas en subtitulado en el futuro. Aunque los subtituladores no profesionales muestran optimismo respecto al uso futuro de las tecnologías lingüísticas, y consideran que la calidad actual de la traducción automática (MT) y del reconocimiento automático de habla (RLA) es inadecuada. Estas perspectivas contribuyen a una comprensión más refinada de la comunidad de *fansub* en China y subrayan la necesidad de mejoras adicionales en las tecnologías de subtitulado.

Palabras clave: Subtituladores no profesionales; conciencia tecnológica; tecnologías de subtitulado especializadas; tecnologías del lenguaje.

1. INTRODUCCIÓN

Recent developments in technology have had a significant impact on audiovisual translation (Granell and Chaume, 2023; Bywood, 2020, p. 503; Baños, 2018, p. 4), leading to substantial changes in the field. Scholars like Dwyer (2018, p. 436) describe audiovisual translation (AVT) as being "hostage to the winds of technological change". Embracing the technology turn, AVT has witnessed the influence of these advancements in both academia and the industry (Díaz-Cintas, 2013, pp. 123-124). Within the realm of audiovisual translation, subtitling has received significant attention concerning the impact of technological advancements. Subtitling demands both the acquisition of technological literacy and the ability to adapt to continuously evolving working conditions (Bywood, 2020, p. 506), and subtitlers have a wide range of

choices of software and tools during subtitling, as they can harness different state-of-the art technologies (Bywood, 2020; Díaz-Cintas and Massidda, 2019; Baños, 2018). To date, there has been scant scholarly investigation of the interaction between technological advancements and Chinese subtitlers, particularly non-professional ones, who have exhibited exceptional productivity, surpassing government-sanctioned film translation companies in the volume of films translated (Lee, 2018, p. 569).

Non-professional subtitling is now considered a "techno-empowered translation practice" (Yin, 2020; Jiménez-Crespo, 2019, p. 246; Li, 2015. p. 153; Kung, 2016, p. 252), yet the initial stance of scholars did not align with this perspective. In the nascent stage, some scholars contended that non-professional subtitlers lacked formal technology training and that their contributions were primarily confined to translation tasks (Díaz-Cintas and Muñoz Sánchez, 2006, p. 38; Pérez-González, 2006). In tandem with technological breakthroughs in the digital world, there has been a noticeable rise in the use of diverse technologies among subtitling groups. These technologies are transforming subtitling practices in the cyberworld (Díaz-Cintas, 2018), fostering the growth and development of fansub groups (Pérez-González, 2012), and exerting a discernible influence on the profile of non-professional subtitlers (Beseghi, 2021, p. 102; Díaz-Cintas, 2018, p. 131). Scholars emphasise that expertise in technologies is a defining characteristic of members in fansub groups (O'Hagan, 2009, p. 101). However, little research has hitherto been conducted to discuss this redefining characteristic of non-professional subtitlers. To address this gap, this study seeks to answer the following research questions: 1) What are the profiles of Chinese non-professional subtitlers in the current digital era?; and 2) what is their level of technology awareness? Technology awareness refers to a set of attitudes that manifest in a series of skills and intentions (Stocklmayer and Gilbert, 2002). Technology awareness is examined in two parts: first, particiants' adoption of specialised subtitling and language technology, which demonstrates the use and mastery of these technologies; and second, their attitudes towards these two technologies, which denote their predisposition to these two technologies. In this light, this study delineates a more comprehensive understanding of fansub groups in China and provides in-depth information on the interaction between non-professional subtitlers and the use of technology.

2. LITERATURE REVIEW

2.1. Subtitling and technology

The work of subtitlers has been significantly influenced by the effects of digitization, leading to multiple changes and transformations in its architecture over recent decades (Díaz-Cintas and Remael, 2021, p. 243). Two types of technologies play pivotal roles in the domain of subtitling, respectively specialised subtitling technologies and language technologies (Baños, 2018). Specialised subtitling technologies, including specific subtitling software and relevant technical skills, have the potential to directly impact the subtitling process. Various technical parameters, such as style guide, speed, time code and formatting, may determine subtitling quality (Díaz-Cintas and Remael, 2021, p. 142). Spotting, which involves determining the timecode and speed for subtitles, is a critical technical skill in subtitling. It ensures that subtitles are accurately synchronised with the audio and video, enhancing the viewer's comprehension and overall experience. This skill has been investigated in the professional context. Oziemblewska and Szarkowska (2022) suggest that the requirement for spotting skills may not necessarily apply to new professional subtitlers, but it remains unclear whether the same holds true for non-professional subtitlers. Additionally, proficiency in encoding and typesetting constitutes another essential technical competency in the practice of subtitling. The embedding of subtitles into raw media and the typesetting of special effects are technical competencies that fall outside the conventional scope of the professional subtitling workflow (Díaz-Cintas and Remael, 2021, p. 38). As a result, there is a paucity of academic research on expertise in encoding and typesetting among professional subtitlers. Conversely, these skills are integral to fansub groups, where they are essential for the enhancement and customisation of subtitle presentation (Díaz-Cintas and Muñoz Sánchez, 2006). More importantly, all three technical skills rely heavily on specific subtitling software. It is necessary to express that two things will be demonstrated in this article, the first is the use of specialised subtitling technologies and the second is the mastery of technical skills in the context of fansub groups.Language technologies, particularly the use of MT and ASR, have the potential to facilitate the process of subtitle production (e.g., Baños, 2018, pp. 5-9, 17-23; Díaz-Cintas and Massidda, 2019, pp. 257-259). However, Bywood,

Georgakopoulou, and Etchegoyhen (2017) observe that professional subtitlers' unfamiliarity with these technologies contributes to the sluggish integration of machine translation within the subtitling industry. This slow uptake can likely be attributed to the reliance on statistical machine translation techniques at that time, which often yielded inadequate performance in subtitle translation. In contrast, Matusov, Wilken, and Georgakopoulou (2019) contend that neural machine translation (NMT), with its more advanced capabilities, has the potential to enhance subtitling efficiency. Nonetheless, it remains uncertain whether subtitlers are inclined to integrate NMT into their practices. ASR is also frequently applied in subtitling, particularly in the context of transcription. Although the application of ASR often dwells on living subtitling (Van Waes, Leijten and Remael 2013; Remael, Van Waes, and Leijten, 2014), Díaz-Cintas and Remael (2021, p. 33) highlight that ASR could help generate transcriptions for translation automatically, which is overlooked in most studies. Thus, in terms of language technologies, this study focuses on non-professional subtitlers' adoption and their views on how MT and ASR influence their translations.

A handful of studies explore the interaction between technologies and non-professional subtitling. Hu (2007, pp. 550-566) notes the role of technologies in facilitating the circulation and consumption of Chinese fansubbed works, but Hu only focuses on the translation of subtitled Japanese dramas. In a study on Thai fansub groups, Wongseree (2020) similarly emphasises the importance of technologies in producing and distributing fansubbed translation, but subtitlers' views and usage of technologies are not fully elaborated on. While Wang and Zhang (2017) point out that fansubbing in China is facilitated by technologies, little attention has been paid to non-professional subtitlers' views on technologies, and still less to the extent to which they use technologies. Therefore, it is crucial to engage in a more comprehensive examination of the extent to which non-professional subtitlers are using these advanced technological tools.

2.2. Non-professional subtitlers and fansubbing communities

Both non-professional subtitlers and fansubbing communities have attracted great attention from scholars worldwide (e.g., Massidda, 2015; Orrego-Carmona, 2016; Pedersen, 2018). This thriving translation activity has broadened the understanding of subtitling in the cyberworld

and reshaped the media industry, thereby inciting scholarly discourse on its conceptual definition. Due to the heterogeneous nature of fansubbing, scholars have referred to this activity with different terms, such as "fansubbing" (Díaz-Cintas and Muñoz Sánchez, 2006), "amateur subtitling" (Bogucki, 2009, pp. 49-57) or "volunteer translation" (Pym, 2011, p. 108). Orrego-Carmona and Lee (2017, p. 2) agreed that non-professional subtitling should be used as an umbrella term to describe this online activity, and this terminology is broad enough to encompass similar concepts (Antonini et al., 2015, p. 9).

The quality of fansubbed productions remains a contentious topic in academic discussions. Pedersen's (2018) study offers a critical perspective on the quality of fansubbed translations. By employing the FAR model to analyse sixteen subtitled versions of ten English-language films, Pedersen concludes that subtitles produced by non-professional subtitlers generally exhibit lower quality compared to professional subtitles. In contrast, the studies by Orrego-Carmona (2016), Lu and Lu (2021) and Dore and Angelica (2022) present a more favorable view of fansubbed subtitles. Orrego-Carmona's research finds that fansubbed and professional subtitles can be equally effective in terms of viewer reception, while Lu and Lu argue that fansubs often offer better semiotic coherence and aesthetic appeal compared to official translations. Dore and Angelica also mention that fansubbed subtitles have their own merits in translating religious references and coarse language. The divergent findings among the studies may stem from the variability across different language pairs. It should be acknowledged that merely comparing the subtitles produced by fansub groups makes it difficult to gain a deeper understanding of this online community. This approach often fails to account for the underlying dynamics and unique features of these groups. Consequently, it raises questions about how the inherent characteristics of fansub groups might influence the subtitles they produce. Thus, it is crucial to examine not only the final subtitled productions but also the internal processes and motivations driving these groups.

A host of studies offer a glimpse into specific fansub groups. Dwyer (2012) investigates ViKi fansubbing from the lens of collaborative methods and genre selection. She also acknowledges the importance of such a fansub group in audiovisual translation practice. Wang (2017) investigated the workflow of YYeTs, the biggest fansub group in China and further examined the creativity of its productions. These studies often overlook the considerable diversity within fansubbing communities,

which can exhibit significant variability. Consequently, some researchers may opt to compare two or three specific fansub groups to address this gap. Zheng and Zhang (2022) conducted a detailed study of two Chinese fansub groups, YYeTs and Alpha Squad, providing an analysis of their participants' motivations, qualifications, and labor management practices. In a broader investigation, Lu (2019) examined three fansub communities to elucidate the operational mechanisms within Chinese fansubbing. Due to English being a prevalent source language for Chinese non-professional subtitlers (Li, 2015, p. 151), there is a notable paucity of research on other languages, such as French to Chinese (Liu and De Seta, 2014) or Spanish to Chinese (Moreno García, 2020). A significant portion of the literature addresses major fansub groups, which leads to the marginalization of smaller, less prominent fansub communities. Furthermore, much of the research concentrates on specific language pairs, which results in a relative neglect of other linguistic combinations in the field of fansubbing.

As Luczaj and Holy-Luczaj (2017) criticised, limited empirical studies on fansub groups, most of which comprise qualitative case studies, with a notable lack of concrete quantitative data, have been published to date. Survey-based studies offer a promising approach to address the existing gap in fansub research. For example, Gao and Shen (2024) use surveys to explore public perceptions of Chinese non-professional subtitlers, while Chu (2013, pp. 259-277) investigates the attitudes of eighty active fansubbers. However, there remains a notable absence of research that examines non-professional subtitlers from a tech-savvy perspective. This area is particularly significant as it encompasses the impact of technological proficiency on fansubbing practices, which could provide valuable insights into how technological tools influence non-professional communities.

3. METHODOLOGY

This study aims to investigate Chinese non-professional subtitlers' technology awareness of specialised subtitling technologies and language technologies. In doing so, the study tries to provide factual data to demonstrate current translation practices by non-professional subtitlers in China. To achieve this objective, a questionnaire was used as the data collection instrument. Surveys are vital methodological methods to achieve a plurality of articulations from fan communities

(Bennett, 2017). Questionnaires are one of the most important instruments to conduct survey studies. Questionnaires are usually employed in research on technologies in translation studies (Saldanha and O'Brien, 2013, p. 151) as they allow researchers to collect a great amount of structured data efficiently (ibid., p. 152).

Before the official dissemination of the questionnaire, a two-round pilot study was conducted to assess its reliability and validity. In the first round, upon completion of the survey by fifteen non-professional subtitlers, feedback was collected to identify and address any ambiguities in or misunderstandings of the questionnaire items. The questionnaire was then revised based on the feedback to enhance clarity and accuracy. In the second round, the questionnaire was distributed to 120 non-professional subtitlers. To further prove the reliability and validity, all five-point Likert-scale questions were estimated by SPSSAU in the pilot study, and the Cronbach's alpha was equal to 0.951. As the questionnaire demonstrated high reliability, no modifications or adjustments were made. The data collected during the second-round pilot study were also included in subsequent analyses.

This questionnaire comprised three parts, which included closed and Likert-scale questions. The first part concerns demographic information and contains questions related to gender, age, education, etc., in order to sketch out participants' profiles. Technology-perception-related items were also investigated in this part. These items, derived from Gough (2011) who investigates technology use and perceptions among professional translators, are also crucial for understanding non-professional subtitlers. They serve to classify these individuals according to their technological practices and offer insights into how various technology applications are adopted by non-professionals in the subtitling field. The following two parts mainly focus on the adoption of technologies and the attitudes towards them . The familiarity with and use frequency of technology has been examined among professional literary translators (Slessor, 2020) or student translators (Man *et al.*, 2020), while audiovisual translators, especially non-professional subtitlers, remain underexplored in scholarly research. Drawing upon similar items employed in the aforementioned studies, a 5-point scale was employed to evaluate both the propensity of non-professional subtitlers to use technology and the frequency of their technology usage. The second part (containing six questions) relates to their attitudes towards specialised subtitling technologies and their adoption of these

technologies. Respondents were required to answer all questions in these two parts. The third part addresses their attitudes towards language technologies and their adoption of them. This part consists of twelve questions. Since some questions were contingent on the answers to previous questions, not all respondents answered all twelve questions.

The data was sampled from 3rd August 2022 to 4th September 2022 via an online questionnaire platform created through SOJUMP (问卷星), a Chinese online survey platform. The questionnaire was disseminated in Chinese, the mother tongue of all participants, through specific online chat groups and social media platforms to ensure that only non-professional subtitlers who translate foreign languages into Chinese were included. The questionnaire was initially shared through a chat group on WeChat, a Chinese counterpart to WhatsApp or Messenger. This is a private chat group founded by the leader of one of the leading fansub groups in China. All participants were invited by the group administrator, thus guaranteeing that every member in this WeChat group is a verified non-professional subtitler. The membership count of the group has reached 300 individuals. The distribution of this questionnaire was supported and approved by the administrator. Snowball sampling was used among the distribution, which means that group members were encouraged to distribute questionnaires to their fansub groups to obtain as much data as possible. A researcher is sometimes an "outsider" to the fan community (Bennett 2017, p. 40), but this distribution channel narrowed the gap between the researchers and the fan community. Subsequently, the questionnaire was sent by private message to fansub groups' official accounts on Weibo, a Chinese counterpart to X. During the distribution of the questionnaire, to reduce potential data contamination, potential participants were informed that the survey is specifically targeted at non-professional subtitlers. Participants were instructed to select 'no' and exit the survey if they did not fit the intended participant profile.

To screen duplicates, the questionnaire was set to be filled by respondents only once. All respondents voluntarily filled out the questionnaire. Their data were downloaded from the questionnaire platform and stored anonymously. Due to ethical restrictions, the data supporting the findings are available by request from the corresponding author. In terms of ethical clearance, all participants were required to read the consent form before answering the questionnaire. The consent form

included information about the researchers and their use of the data. Only participants who provided explicit consent for their responses to be used in academic publications were permitted to complete the questionnaire. In total, this study yielded 356 valid responses from non-professional subtitlers.

4. RESULTS AND DISCUSSION

4.1. Profiles of respondents

The demographic profile of non-professional subtitlers reveals a gender imbalance. Out of the 356 respondents, there were 240 females, representing 67.42% of the total, and 116 males, comprising 32.58%. The gender distribution in the survey was not evenly balanced, which echoes the findings from previous studies conducted by Chu (2013) and Moreno García (2020). Both studies, though conducted in different years, reported that the number of females significantly outnumbered that of males in Chinese fansub groups. It can be concluded that the gender distribution in fansub groups remains imbalanced, with a female-to-male ratio of approximately seven to three.

Regarding the age composition of participants, they were requested to select a specific age range. As displayed in table 1 below, the largest group consisted of individuals between "22-27 years old", while the second largest group was made up of "below 22 years old".

Table 1. Survey respondents by age group

Age Group	Number of Respondents (%)
Below 22 years old	99 (28%)
22-27 years old	166 (47%)
28-32 years old	61 (17%)
33-37 years old	18 (5%)
38-42 years old	8 (2%)
Above 42 years old	4 (1%)

In China, according to the *51st Statistical Report on China's Internet Development* (https://www.cnnic.cn/NMediaFile/2023/0807/MAIN 1691 37187130308PEDV637M.pdf) released in 2023, more than half of Chinese netizens are below forty years old. Compared with the average age of Chinese netizens, non-professional subtitlers are much younger.

An array of scholars (e.g., Zhang, 2013; Chu, 2013, p. 265; Liu and De Seta, 2014, p. 126; Hsiao, 2014, p. 219) have found that most non-professional subtitlers are in their twenties. The result of this study further verifies that more than 70% of respondents were in the age categories of "Below 22 years old" and "22-27 years old", which are respectively known as the "post-00s generation" (i.e., those born after 2000) and "post-95s generation" (i.e., those born after 1995). The two generations are commonly referred to as "Generation Z" or "digital natives" and were born during the widespread adoption of personal computers. From birth, they have been immersed in the digital information era, experiencing significant exposure to digital technologies, instant communication devices, and smartphone innovations. They devote substantial time to online environments where they not only consume digital content but also actively participate in its creation and production. This behaviour reflects their deep engagement with and participatory interaction with digital media. Interestingly, Zhang (2013, p. 30) found that the majority of non-professional subtitlers were born from 1985 to 1990 (23-28 years old at that time), but they are now a minority in Chinese fansub groups. It can be concluded that Chinese fansub groups remain predominantly populated by young people in their twenties, particularly those from Generation Z. However, the cohort of active young participants who were central to fansub communities a decade ago has since disengaged. This phenomenon highlights the dynamic turnover within fansub communities, where younger individuals consistently remain the primary contributors, yet there has been a notable and ongoing shift in the age composition over time.

In previous studies, there has been a dispute regarding whether non-professional subtitlers receive any translation training. Antonini *et al.* (2017, p. 9-10) claims that most non-professional subtitlers do not receive any translation training. By contrast, Li (2015, p. 150) suggests that professionals may participate in non-professional subtitling, which implies non-professional subtitlers may possess adequate skills. To explore this issue further, the questionnaire included an item asking respondents about their experience of translation training. The results revealed that over half (53.65%) of the respondents reported not having received any translation training. In contrast, 108 respondents, or 30.34% of the total, acknowledged having completed professional translation training, indicating that these individuals either majored in languages or

took university-level translation courses. Fifty-seven respondents, accounting for 16.01%, had undertaken in-house training, such as extracurricular translation training programmes or translation programmes provided by fansub groups. Among the 108 respondents who did not have any translation training, just 40 of them did not hold any language certificate, such as College English Test Band 4 (CET-4) and Band 6 (CET-6), IELTS, TOEFL, China Accreditation Test for Translators and Interpreters (CATTI), etc. Therefore, it can be inferred that the receipt of formal translation training cannot be considered a definitive criterion in the classification of "non-professional subtitlers". It can be further deduced that non-professional subtitlers within Chinese fansub groups are characterised not only by their youth but also by a high level of educational attainment, particularly in relation to language certifications.

Respondents were further asked to provide detailed information about their engagement with fansub groups, including the number of years of subtitling experience (figure 1) and the membership count of their groups (figure 2).

Figure 1. Distribution of respondents by number of years
of subtitling experience in fansub groups

**Membership count of fansub groups**
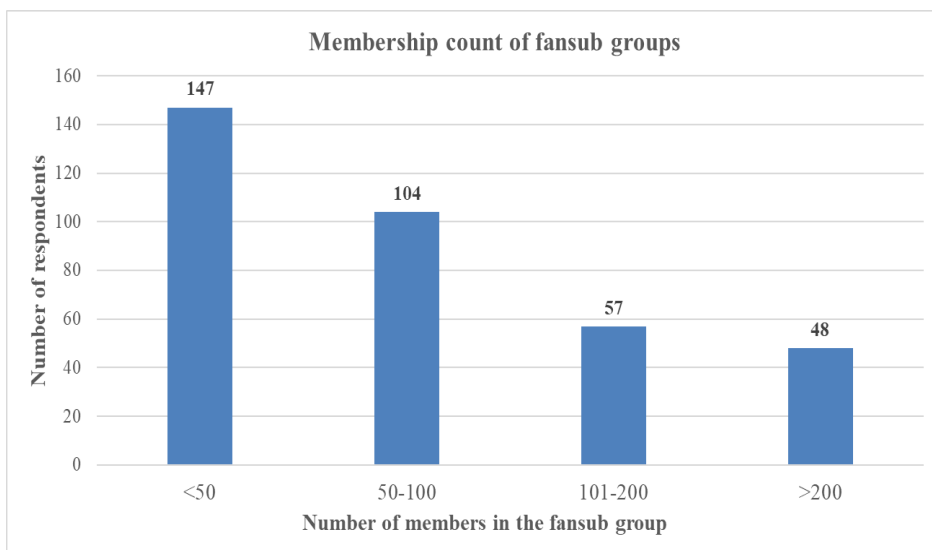
Figure 2. Distribution of respondents by
the membership count of fansub groups

In terms of years of experience, more than a third of respondents had one to three years of experience of non-professional subtitling, and around a quarter of the respondents had less than one year of experience. It can be presumed that the majority of respondents have at least one year of experience, which means they, at least, have accumulated some experience in subtitling.

Chinese fansub groups are typically categorised as either medium or small in size. Seventy-one percent of respondents claimed that there are less than 100 members in their fansub groups. This membership count indicates that major fansub groups with memberships exceeding 100 individuals are comparatively scarce. It should be noted that non-professional subtitlers are just one of several roles within a fansub group; there are also raw providers, timers, typesetters and encoders in the fansub groups (Díaz-Cintas and Muñoz Sánchez, 2006, p. 39).

Both Zhang (2013, p. 31) and Li (2015, p. 151) have found that the top three source languages in Chinese fansub groups are English,

Japanese and Korean, but, unfortunately, neither researcher provided data to support their claims. Therefore, it is pertinent to examine the distribution of languages that Chinese non-professional subtitlers are currently translating. A total of nine languages of translation were represented in the survey, as figure 3 shows:
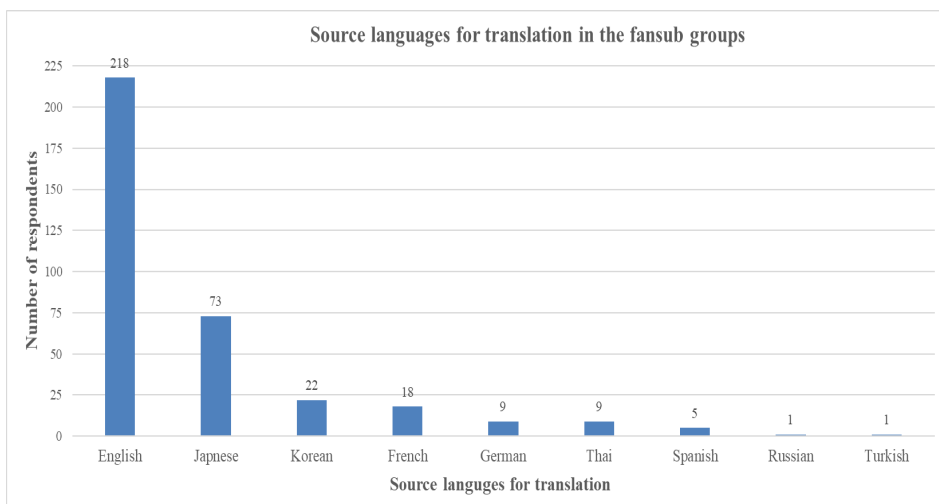
Figure 3. Distribution of respondents by source languages of translation

It is revealed that English is the predominant source language in fansub groups, with 218 respondents (61.24%) selecting it. This is followed by Japanese, chosen by 20.50% of respondents, Korean at 6.18%, and French at 5.06%. German and Thai each account for 2.53%. The primary source languages for translation in Chinese fansub groups have remained consistent over the past decade, with English, Japanese, and Korean continuing to be the predominant languages. This stability reflects the enduring significance of these languages within the fansubbing community and underscores their sustained influence on translation practices in this field. It is pertinent to observe that Russian and Turkish were not addressed in prior studies. This demonstrates the growing diversification in the translation practices of Chinese fansub groups. The inclusion of these two languages signifies an expansion in the scope of translation practices and reflects an evolving global perspective within the Chinese fansubbing community.

In the last item of this section, all respondents were asked to classify themselves according to their adoption of new technologies. Based on the adopter categories defined by Rogers (1983, pp. 248-250), this survey included four classifications: late majority, early majority, early adopters and innovators. The late majority are sceptical about new technologies and adopt new emerging technologies "just after the average member of a social system" (Rogers, 1983, p. 249), which implies they may be reluctant to use specialised subtitling technologies and language technologies when subtitling. The early majority group have cautious attitudes towards new emerging technologies and adopt them "just before the average member of a social system" (ibid., p. 249), which indicates they may be prudent about using technologies during subtitling. Early adopters respect new technologies (ibid., p. 248) and accept them at an early point in time, which signifies they are willing to employ technologies during subtitling. Innovators are venturesome and very eager to try new technologies (ibid., p. 248), so they are willing to pick up new technologies as soon as they emerge. The distribution result of the survey is shown in figure 4.
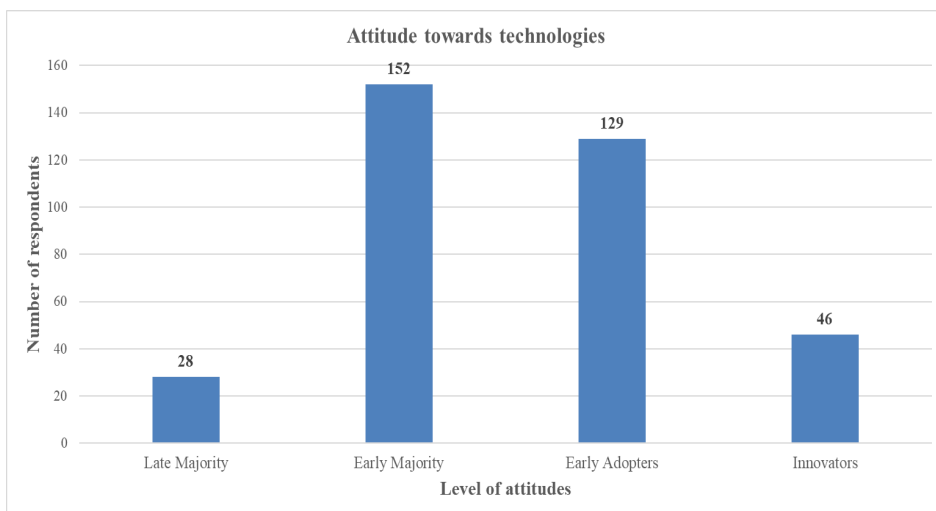

Figure 4. Distribution of respondents by attitudes towards technologies

Nearly half of the respondents (49.16%, 175 people) identified themselves as "innovators" or "early adopters", and more than one third of respondents thought of themselves as the "early majority", accounting

for 42.70% of the total. Consequently, it can be posited that a substantial proportion of non-professional subtitlers accept newly emerging technologies at an early phase. As Dwyer (2018, p. 447) points out, non-professional subtitlers are "lead users" (Von Hippel, 1986) who proactively use novel products or new technologies. In this context, "lead users" parallels the concepts of "innovator" and "early adopters". Therefore, this survey indicates that approximately half of the non-professional subtitlers in China are so-called "lead users". The prevalence of technophiles is notably high in this technology-facilitated translation practice. Among lead users, 75 respondents (43%) had received translation training, whereas only 48 individuals (27%) had engaged in formal translation training. It appears that experience in translation training may not significantly affect their propensity to utilise advanced technologies. Given that 78% of the participants (137 people) are aged 27 or younger, it can be inferred that the relatively younger demographic of fansub groups may contribute to a greater openness toward embracing new technologies.

4.2. Adoption of and attitudes towards specialised subtitling technologies

The first question of this section pertains to the type of specialised software used by non-professional subtitlers. It is a multiple-choice question, so respondents may identify more than one software that they use during subtitling. Aegisub (https://aegi.vmoe.info/) ranked first, followed by Arctime (https://arctime.org/), Adobe Premiere Pro (https://www.adobe.com/products/premiere.html), Ren Ren Yi Shi Jie (人人译视界, https://www.1sj.tv/) and Subtitle Edit (http://www.nikse.dk/ subtitleedit). Most of the software used by Chinese non-professional subtitlers is freeware, except for Adobe Premiere Pro. The use of freeware for subtitling is quite common among non-professional subtitlers (Baños, 2018, p. 7), because freeware is affordable and much more intuitive than proprietary tools. Thus, freeware empowers non-professional subtitlers to start subtitling more easily.

Subtitling freeware provides non-professional subtitlers with a stable environment during subtitling. However, subtitling technical skills encompass more than using subtitling freeware. The next set of questions addressed the focus of the technical skills during subtitling. Non-

professional subtitlers' mastery of and attitudes towards technical skills, such as spotting, typesetting and encoding, were all investigated. All respondents were asked to evaluate their proficiency and mastery of subtitling technologies and skills. Table 2 presents the results.

Table 2. Self-evaluation of mastery of technical skills during subtitling

	Never heard of (=1)	Heard of But not competent (=2)	General understanding (=3)	Proficient (=4)	Expert (=5)	Average index
Spotting	6 (2%)	71 (20%)	117 (33%)	97 (27%)	65 (18%)	3.41
Typesetting	8 (2%)	173 (49%)	118 (33%)	40 (11%)	17 (5%)	2.68
Encoding	15 (4%)	125 (35%)	113 (31%)	57 (16%)	46 (12%)	2.98

Although it is considered ideal for professional subtitlers to do spotting by themselves (Díaz-Cintas and Remael, 2021, p. 34), Oziemblewska and Szarkowska (2022) argue that it is not essential for professional subtitlers to do so. For non-professional subtitlers in China, mastering spotting remains crucial in subtitling.

In fact, almost 80% of the respondents professed mastery in spotting. In addition, around 49% respondents claimed that they knew how to typeset and about 60% respondents mastered encoding. Then, attitudes towards the necessity of mastering subtitling technologies were investigated (see table 3).

Table 3. Attitudes towards the necessity
of mastering technical skills of subtitling

	Very unnecessary (=1)	Unnecessary (=2)	Neutral (=3)	Necessary (=4)	Very necessary (=5)	Average Index
Spotting	4 (1%)	11 (3%)	80 (23%)	176 (49%)	85 (24%)	3.92
Typesetting	15 (4%)	40 (11%)	179 (51%)	104 (29%)	18 (5%)	3.20
Encoding	10 (3%)	29 (8%)	151 (43%)	126 (35%)	40 (11%)	3.44

Two hundred and sixty-one respondents (73%) agreed that mastering spotting is necessary or very necessary. Only 4% of respondents (15 people) thought it was unnecessary or even very unnecessary to learn how to spot. More than one third of respondents (34%, 122 people) supported mastery of typesetting and nearly half of respondents (46%, 166 people) confirmed the necessity of mastering encoding. It can be inferred that non-professional subtitlers are sometimes required to complete additional technical tasks beyond conventional subtitling duties.

It would also be valuable to investigate how attitudes towards subtitling technologies are influenced by factors such as the number of years of experience in fansub groups, the size of these groups, and their general attitudes towards emerging technologies. The Pearson's chi-squared test was conducted with the attitudes towards the necessity of mastering specialised subtitling technologies (very unnecessary, unnecessary, neutral, necessary and very necessary), attitudes towards the necessity of mastering subtitling technologies (late majority, early majority, early adopter and innovator) and years of experience (<1, 1-3, 4-6, 7-9, >9). The analysis indicates that attitudes towards spotting are not significantly associated with attitudes towards emerging technologies ($\chi(12)=18.68$, $p=.096$). On the other hand, both years of experience in fansub groups ($\chi(16)=26.76$, $p=.044$) and scale of fansub groups ($\chi(12)=3.13$, $p=.036$) have a statistically significant impact on perceptions regarding the necessity of mastering spotting. Attitudes towards the necessity of mastering typesetting are not significantly related to the size of fansub groups ($\chi(12)=10.65$, $p=.560$) or attitudes towards new emerging technologies ($\chi(12)=16.52$, $p=.169$). The sole variable demonstrating a statistically significant influence is years of experience in fansub groups ($\chi(16)=21.87$, $p=.018$). This finding suggests that the extent of experience in fansub groups is the only factor that significantly affects perceptions of typesetting necessity. The relationship between attitudes towards encoding and the scale of fansub groups was not statistically significant ($\chi(12)=14.52$, $p=.269$), nor was there a significant relationship with attitudes towards new emerging technologies ($\chi(12)=18.52$, $p=.101$).However, the duration of experience in fansub groups was significantly related to attitudes towards encoding ($\chi(16)=20.90$, $p=.018$). This suggests that experience within fansub

groups plays a critical role in shaping attitudes towards encoding practices. It stands to reason that the attitudes towards the necessity of mastering specialised subtitling technologies is correlated with the number of years of experience in fansub groups. The further analyses suggest that individuals with less experience in non-professional subtitling are significantly less likely to view spotting, typesetting, and encoding as essential. As experience accumulates, however, non-professional subtitlers increasingly recognise the importance of technical skills in subtitling. While some fansub groups still have dedicated typesetters and encoders, there is a growing trend in non-professional subtitlers becoming versatile translators who manage both linguistic translation and technical aspects of subtitling software, thereby contributing comprehensively to subtitle production.

Given the mounting importance of subtitling technologies for non-professional subtitlers, the respondents were surveyed to gauge their level of agreement on the future use of these technologies (see figure 5).
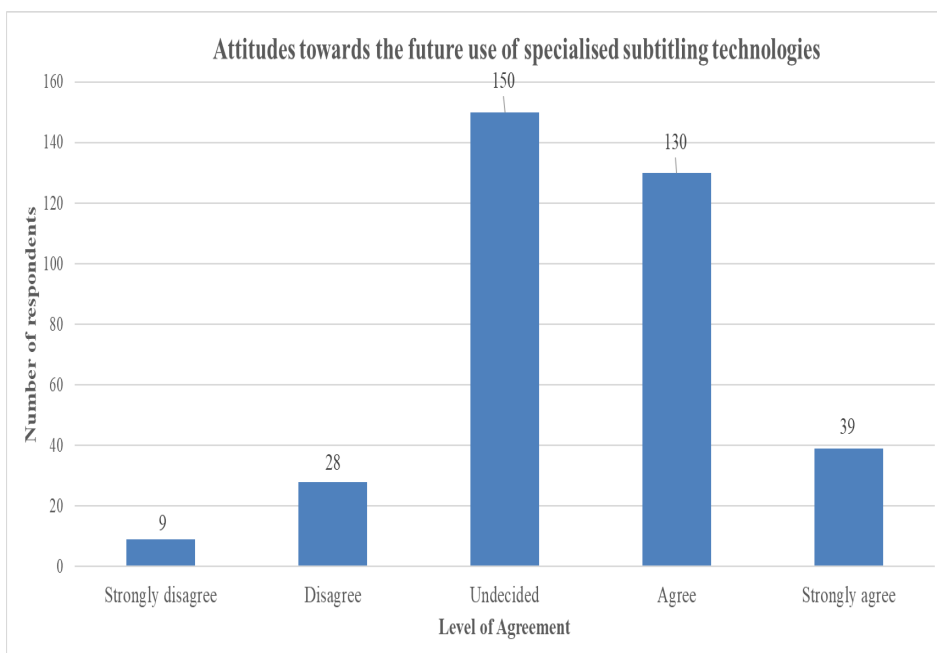
Figure 5. Distribution of respondents by attitudes
towards the future use of specialised subtitling technologies

The vast majority agreed that specific subtitling technologies will be essential in the future (M=3.46, SD=0.88). A negligible number of respondents (37 people) expressed strong disagreement with this assertion. Accordingly, one can conclude that most non-professional subtitlers think acquiring technical skills is vital. They believe that these technologies will be increasingly indispensable for subtitlers in the future. This finding indicates that the responsibilities of non-professional subtitlers are expanding beyond mere translation. They are increasingly expected to master subtitling software and acquire technical skills essential for the subtitling process.

4.3 Adoption of and attitudes towards language technologies

MT and ASR are two language technologies that have significant implications for subtitling (Díaz-Cintas and Remael, 2021, p. 62). Much of the research in this area has concentrated solely on professional subtitlers (e.g., Vitikainen and Koponen 2021; Bywood, Georgakopoulou and Etchegoyhen, 2017), whereas non-professional subtitlers have been largely overlooked. MT can accelerate the productivity of subtitling (Díaz-Cintas and Remael, 2021, p. 243) and ASR can generate the original scripts rather than transcribing subtitles manually (ibid., p. 33). Therefore, the frequency of MT and ASR use was investigated first (see table 4).

Table 4. The frequency of MT and ASR use

	Never (=1)	Rarely (=2)	Sometimes (=3)	Often (=4)	Always (=5)	Average index
MT	98 (27%)	67 (19%)	124 (35%)	56 (16%)	11 (3%)	2.48
ASR	165 (46%)	94 (27%)	21 (6%)	65 (18%)	11 (3%)	1.93

The survey revealed that over 70% of participants employ machine translation (MT) to assist in their translation. Nonetheless, the average index for the frequency of machine translation usage was 2.48, suggesting that despite its use, the frequency of reliance on MT remains relatively low. An open-ended question was designed to further examine the underlying factors that influence the decision to adopt or forego MT during subtitling. The most frequent word participants mentioned was "accuracy."

MT fails to provide satisfactory results, especially in terms of maintaining the required level of conciseness in subtitles (Lu, 2023). The shorter length of subtitles does not typically lead to improved outcomes in audiovisual translation (Burchardt *et al.*, 2016). Some respondents also doubted whether MT could handle polysemous words or slang. As a result, the quality of subtitles is the priority for non-professional subtitlers when deciding whether to adopt this technology. Since most respondents admitted to the use of MT, a follow-up question about which MT engine they used was raised. This multiple-choice question allowed respondents to select all machine translation engines that they deemed potentially advantageous for their subtitling tasks. According to their responses, Baidu Translate (*百度翻译*) was the most popular option, followed by DeepL, Google Translate, Bing Microsoft Translator and Youdao Translator (*有道翻译*). It is noteworthy that Baidu Translate was the most extensively used engine among Chinese non-professional subtitlers. One possible reason is that Baidu, the largest Internet company in China, offers convenient access for Chinese non-professional subtitlers. Additionally, Baidu Translate exhibits superior translation performance for English-Chinese language pairs compared to other machine translation engines (Liu and Zhu, 2023). This enhanced performance likely contributes to its preference among non-professional subtitlers for subtitling tasks.

Compared with MT, ASR was used less frequently by respondents. Nearly half of the respondents (46%, 165 people) reported that they never use ASR to help generate transcripts automatically. The average index of frequency of using ASR is about 1.93, implying that ASR is not a common language technology for non-professional subtitlers. Among all source languages for translating, non-professional subtitlers who translate Korean (73%, 16 people) are less likely to use ASR, followed by those who translate Japanese (67%, 49 people) and German (56%, 5 people).

This result supports the statement by Díaz-Cintas and Massidda (2019, p. 260) that "ASR apps can only work with certain major languages." Respondents' views on the quality of MT and ASR were then investigated. It is essential to note that respondents who answered "never" to the previous question were excluded from the analysis.

Thus, these two questions were only answered by those who chose using MT or ASR during subtitling (see table 5). Out of the remaining participants, 258 respondents provided feedback on the quality of MT and 191 respondents commented on the quality of ASR.

Table 5. Attitudes towards the quality of language technologies

	Extremely Unsatisfactory (=1)	Unsatisfactory (=2)	Average (=3)	Satisfactory (=4)	Very satisfactory (=5)	Average index
MT	10 (4%)	56 (22%)	167 (65%)	25 (9%)	0 (0%)	2.80
ASR	6 (3 %)	26 (14%)	110 (57%)	48 (25%)	1 (1%)	3.06

Although fewer respondents used ASR than MT, they thought the quality of ASR was much higher than that of MT. Almost one quarter of respondents expressed dissatisfaction with the quality of MT and the average index further proves this result. More interestingly, no respondent rated machine-generated subtitle translation "very satisfactory". This implies that there is ample room for MT to improve. As for ASR, its quality in participants' view just reached the average, and one quarter of respondents expressed positive attitudes towards its use. In summary, non-professional subtitlers use MT much more frequently than using ASR. Conversely, in their opinion, the quality of ASR-generated transcripts is much better than that of machine-generated subtitles. Finally, table 6 displays respondents' attitudes towards use of language technologies in the future.

Table 6. Attitudes towards using MT and ASR in the future

	Strongly disagree (=1)	Disagree (=2)	Neutral (=3)	Agree (=4)	Strongly agree (=5)	Average index
MT	26 (7%)	49 (14%)	111(31%)	152 (43%)	18 (5%)	3.24
ASR	13 (4%)	37 (10%)	134 (38%)	148 (41%)	24 (7%)	3.37

Non-professional subtitlers exhibited relatively favourable attitudes towards language technologies, as evidenced by both average indices exceeding 3 (neutral) and almost half of non-professional subtitlers indicating their agreement or strong agreement with the use of these technologies, with 48% for MT and a similar percentage for ASR. In comparison to the average indices of current use, indices of attitudes were much higher. This suggests that non-professional subtitlers are likely to embrace language technologies in the future, though some of them have been unable to master them and satisfaction regarding the quality of these two technologies for subtitling is somewhat lacking. The participants are optimistic about the future advancements of language technologies, which may motivate the relevant technology companies to improve their products to better serve subtitlers.

5. SUMMARY AND CONCLUSION

This research endeavours to elucidate the demographic profile of Chinese non-professional subtitlers in the digital era and to investigate their adoption of technology and their attitudes towards technological advancements. The results reveal that Generation Z comprises the majority in Chinese fansub communities. Their gender distribution has remained imbalanced, and women exceed men. Contrary to certain existing literature, this study points out that approximately 50% of Chinese non-professional subtitlers have received formal translation training, indicating a familiarity with translation practices. However, the extent of their expertise in audiovisual translation, particularly in the

domain of subtitling, warrants a more comprehensive academic examination in future research.

The investigation also examined their technology awareness with respect to specialised subtitling technologies and language technologies. Four significant findings emerged. First, non-professional subtitlers frequently utilise freeware and emphasise spotting as the predominant technical skill in subtitling, as opposed to giving equal attention to encoding and typesetting. Secondly, data reveal that non-professional subtitlers with more experience are more likely to acknowledge the critical importance of technical skills. Thirdly, non-professional subtitlers exhibit a higher frequency of use of MT compared to ASR. However, both technologies are infrequently employed overall, due to concerns about their quality. This observation highlights a critical need for advancements in the output quality of these language technologies. Fourthly, it is noteworthy that non-professional subtitlers demonstrate a proactive openness to future advancements in MT and ASR. This willingness indicates their anticipation of and positive outlook towards technological developments that could potentially enhance their subtitling.

Scholarly interest in non-professional subtitlers originally emerged from media studies and they are not well received in translation studies (Orrego-Carmona and Lee, 2017, p. 1). This paper examined non-professional subtitlers from the perspective of the role of "translator" rather than of "digital labourer", which extends translation studies about non-professional subtitlers into the technology context. Moreover, it is important to emphasise that non-professional translators are no longer regarded solely as a cost-effective alternative to professional translators, but rather are recognised as possessing additional attributes (Pérez-González and Susam-Saraeva, 2012). It is fair to argue that studies on non-professional translation practice could contribute to translation studies (Orrego-Carmona and Lee, 2017, p. 5). The study of non-professional subtitlers gives academia a more complete picture of subtitling practices in China, extending beyond the conventional emphasis on professional subtitlers. Studies on non-professional subtitlers may encourage more scholars to study this voluntary translation practice. China has transformed from a dubbing country into a subtitling country (Li, in press). Non-professional subtitling is exceptionally prolific within the Chinese audiovisual translation landscape (Lee, 2018, p. 569) and has seen considerable development in

recent years (Li, 2014). A comprehensive understanding of this largest and most significant subtitling group in China may offer valuable insights into the Chinese subtitling industry.

The role of subtitlers extends beyond fundamental translation tasks and encompasses a range of technical skills that are crucial for effective subtitling. Subtitlers may manage not only the translation of dialogue but also the timing and visual formatting of subtitles in the future. This broad scope of responsibilities suggests that subtitler training should be comprehensive, integrating both linguistic skills and technical competencies to ensure high-quality subtitling outcomes. Given the growing enthusiasm for MT and ASR among non-professional subtitlers, the development of MT and ASR may exert considerable influence on future subtitling workflows. It is essential to provide these individuals with guidance on how to effectively engage with these technologies and carry out post-editing tasks after using MT and ASR. Future research could investigate additional technologies, including cloud platforms, collaborative subtitling systems, and AI tools like ChatGPT to provide a more comprehensive understanding of the field. Such research would contribute to a more nuanced understanding of global subtitling practices and the factors influencing technology uptake, offering a richer theoretical framework for evaluating the effectiveness and challenges of these technologies.

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APPENDIX

THE QUESTIONNAIRE

(Original in Chinese)

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A. Your profile

1. Gender

A. Male   B. Female

2. Age

A. Below 22   B. 22-27   C. 28-32

D. 33-37   E.38-43   F. Above 43

3. How long have you been serving as a non-professional subtitler in the fansub group?

A. Less than 1 year   B. 1-3 years   C. 4-6 years

D. 7-9 years   E. Longer than 10 years

4. How many members are there in your fansub group?

A. Less than 50   B. 50-100   C.100-200   D. More than 200

5. Have you ever participated in translation training?

A. Yes, I have participated in formal translation training (e.g., translation courses in the university)

B. Yes, I have participated in formal translation training (e.g., training from fansub groups)

C. No, I have never taken any training.

6. Which language do you mainly translate from in the fansub group?

A. English   B. Japanese   C. Korean   D. French   E. German

F. Spanish   E. Other language_____

7. The highest level of language proficiency/translation proficiency certificate you currently hold *(e.g., CET-4 / CET-6 /IELTS 一please specify the score / CATTI 一 please specify the level)*

_____

8. What do you think is your attitude towards emerging technologies?

A. Late majority   B. Early majority   C. early adopter   D. Innovator

B. Your adoption of and attitudes towards specialised subtitling technologies

9. Which software do you use for subtitle translation? (Multiple choice)

A. Aegisub   B. Arctime   C. DivXL and Media Subtitler   D. PR

E. Subtitle Edit   G. Subtitling Workshop   H. transWAI

I. Word or in plain text format   J. 人人译视界   K. 剪映   L．Others_____

10. How would you assess your proficiency with the following technical skills involved in subtitling?

	Never heard of	Heard of but not competent	General Understanding	Proficient	Expert
Spotting Typesetting Encoding					

11. What is your attitude towards the necessity of mastering technical skills of subtitling?

	Very unnecessary	Unnecessary	Neutral	Necessary	Very necessary
Spotting Typesetting Encoding					

12. Do you think specialised subtitling technologies are necessary for non-professional subtitlers in the future?

A. Strongly disagree   B. Disagree   C. Undecided   E. Agree

F. Strongly agree

D. Your adoption of and attitudes towards language technologies

13. What is your frequency of using machine translation and automatic speech recognition?

	Never	Rarely	Sometimes	Often	Always
MT					
ASR					

14. Which machine translation engine(s) do you choose when subtitling?

A. Baidu Translate   B. Bing Microsoft Translator   C. LingoCloud   D. DeepL

E. Google Translate   F. Volctrans   G. Sougou Translate   H. Youdao Translate

I. Other engine_____

15. Please list your reason why you (not) use machine translation engine?

_____

16. What do you think of the quality of machine translation and automatic speech recognition?

	Extremely unsatisfactory	Unsatisfactory	Average	Satisfactory	Very satisfactory
MT					
ASR					

17. Do you think the machine translation and automatic speech recognition are necessary for non-professional subtitlers in the future?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
MT					
ASR					