



Untapping the potential of cloud subtitling in audiovisual translator education: A pilot study

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Abstract: This paper examines the potential of cloud technologies in audiovisual translator education with a particular emphasis on cloud subtitling. The fast-growing global demand for multimedia content has recently led to the significant growth of audiovisual translation (AVT) as both a professional avenue and an academic discipline (Díaz-Cintas, 2019). Developments in cloud computing have profoundly altered work in the language and translation industries in general and media localisation workflows in particular (Díaz-Cintas & Massidda, 2019). The market's leading stakeholders are currently exploiting cloud technologies in an attempt to maximise resources, extend freelance networks and enhance efficiency. Access to most of these technologies, however, remains restricted to the largest media-streaming and translation service providers, meaning that they cannot be utilised by the public, not least would-be translators and trainers. The umbilical connection between translator education and new technologies, such as cloud computing, calls for a more detailed examination of how cloud subtitling is being integrated into the AVT classroom. Indeed, to be fully employable in an ever-changing market, AVT trainees need to be fully conversant in the latest technologies (Cerezo-Merchán, 2018) and adapt to new ecosystems quickly. The ubiquitous cloud-based revoicing and subtitling editors used in the industry are becoming timidly, albeit steadily, more manifest in higher education. This paper thus examines the uses of cloud subtitling systems in audiovisual translator education following instances of action research (AR) experimentation. It presents the results from a pilot AR study conducted at a translator training institution and ultimately proposes ways to further explore cloud technologies in higher education while fostering academia-industry partnerships.

Keywords: audiovisual translation; cloud technologies; translator training; action research.



I. Introduction

Audiovisual translation (AVT) has outgrown initial descriptive approaches from translation studies (see, e.g., Delabastita, 1989; Gambier & Gottlieb, 2001) and has arguably become a discipline of its own (Díaz-Cintas & Neves, 2015). Most recent AVT research places a stronger emphasis on industry practices and new technologies (O'Hagan, 2013; Chaume, 2013; Díaz-Cintas & Massidda, 2019) as well as experimentation (Díaz-Cintas & Szarkowska, 2020). Fuelled by an ever-growing industry, new industry-led technologies, such as cloud solutions, are currently being integrated into media localisation workflows as well as practitioners' workstations. As technology occupies a more important role in AVT research (e.g., Bywood, 2020), cloud technologies constitute a field worthy of further scholarly attention, and it is of utmost importance that we evaluate their efficiency in research-led translator training scholarship.

This paper endeavours to situate cloud subtitling systems in AVT training settings with an emphasis on learning experiences and perception. A pilot study was conducted with one of the first cohorts of undergraduate students ($N=77$) to be exposed to commercial cloud subtitling solutions in language and translator education. For this, a situated, project-based learning experience (i.e., a face-to-face cloud subtitling workshop) was designed and administered in collaboration with (1) a Dutch-language student association, (2) a non-profit film distribution company, (3) a cloud subtitling software developer, and (4) four UK universities offering Dutch-language undergraduate courses. The learning experience prompted participants to use a professional cloud subtitling ecosystem to translate templates for authentic short films, and the localised clips produced by the participants were shown at a local screening room (RADA Studios, London, United Kingdom).

In this experience, respondents' perceptions were gauged during and after the workshop, and their feedback on the usability of the tool was used to make the latter more appropriate for learning purposes as well as to continue exploring cloud subtitling training through action research (AR) cycles. Building on user-generated feedback from continuous in-class observation and data collection, the results of this paper triggered changes and led to new cycles of experimentation following the principles of AR (see Bolaños García-Escribano, 2023). This paper thus reports on a pilot study on cloud subtitling training that seeks a better understanding of how new technologies can be used and tested in classroom environments following the principles of research-led education. Ultimately, this research approach allows for the establishment of closer synergies between educational centres and the industry for the sustainability of technology-oriented training programmes at university level.

2. The emergence of cloud technologies in translator training environments

AVT practices, such as interlingual subtitling, differ from other practices because of their multimodal nature, which makes their teaching different and unique (Díaz-Cintas, 2008). Many scholars have often ignored the importance of technology and instrumental and occupational subcompetences in AVT education (Bolaños García-Escribano & Díaz-Cintas, 2019). The EMT (2017) framework – including its most recent update – emphasises the importance of both technology and translation service provision as two main areas of competence (Chodkiewicz, 2012).



When it comes to competence building, Cerezo-Merchán (2012, 2018) explains AVT-specific competences in four main categories: communicative and textual, cultural, thematic and instrumental-professional competences (Cerezo-Merchán, 2012). The market requires key instrumental skills, including a strong command of the latest translation tools available (Bolaños García-Escribano *et al.*, 2021a).

In spite of the role played by technology in AVT education, there seems to be little interest in understanding how new technologies, in general, are being integrated into translator training environments in tertiary education and what trainees think about them. Cloud technologies, in particular, appeared over a decade ago but have only started to be used in the AVT industry in the last few years or so. Although these ecosystems are typical in the industry, with some of the largest media distributors and broadcasters relying on browser-based technologies to localise and distribute media content, the integration of cloud dubbing and subtitling in education has not been without challenges. Among the main obstacles that have hampered a wider use of cloud ecosystems in the training of would-be AVT experts is the fact that vendors first manufactured most cloud solutions to serve as proprietary systems. These tools could only be accessed by the relevant vendors' pools of linguists and were restricted to other stakeholders, let alone educators. Nevertheless, software developers soon launched commercial web-based tools that were made available on a pay-as-you-go basis, allowing for further experimentation in training environments (Bolaños García-Escribano, 2018, 2020, 2023).

Cloud solutions are being slowly but surely integrated into AVT training courses nowadays (see Bolaños García-Escribano & Díaz-Cintas, 2020; Bolaños García-Escribano *et al.*, 2021b); indeed, the examination of AVT education in European institutions carried out by Valdez *et al.* (2023) reveals that cloud-based subtitling tools are still being used minimally, with desktop-based freeware solutions overwhelmingly preferred instead. The caveats of using commercial cloud subtitling tools include both the specialist training required and the financial hurdles of purchasing software licenses (which can be simply unaffordable for many under-funded institutions). However, some cloud software developers and media localisation service providers currently offer free access to their online editors to academic partners (e.g., XTRF's project management system, YellaUmbrella's subtitling and audio description tools, and ZooDigital's dubbing and subtitling editors). None of these, however, were included in the survey carried out by Valdez *et al.* (2023), so their use remains to be further explored. Furthermore, in a mercurial industry heavily driven by technological changes (Díaz-Cintas, 2015), software developers and media localisation companies are ever-keener to establish collaborations with universities in an attempt to make workstations more efficient, and many AVT educators are anxious to expose would-be translators to authentic work environments. In light of the latest industry-led translation technologies, it can be argued that cloud-based AVT systems are worthy of further examination.

3. Action research approaches in translator training scholarship

According to Costello (2003, p. 5–6), AR “[...] aims to improve educational practice [and] involves gathering and interpreting data, often on an aspect of teaching and learning”. It aims to inform teaching practices, and its subsequent validation is worthy of dissemination (McNiff, 1996).



AR methods can be instrumental in translator training practices, particularly AVT education, to evaluate teaching approaches, students' engagement and performance, and the tools used. There is a growing body of literature on the uses of AR in translation studies and particularly translator training (Kiraly, 2000; Cravo & Neves, 2007; Hubscher-Davidson, 2008; Boéri & De Jerez, 2014; Massey *et al.*, 2015; Haro-Soler & Kiraly, 2019; Zhong *et al.* 2021; Pavez, 2021), though less so in AVT (Bogucki, 2010; Neves, 2016).

AR can be “[...] an enjoyable way of helping us to reflect and act to improve our teaching and assessment activities” (Hubscher-Davidson, 2008, p. 90). AR approaches have been deemed pedagogically sound and thus hold many advantages for higher education, as previously reported by scholarly research (see, among others, Greenwood & Levin, 1998; Levin & Greenwood, 2008; Noffke, 2009; Gibbs *et al.*, 2017). Despite this, the spread of AR practices has faced criticism because of its (potentially) uncontrollable, subjective and contingent nature (Kock, 2004). As with any other research methodologies, AR has also attracted much interest in regard to ethical considerations, primarily because bias and (either personal or external) interests have been found to drive AR inquiries (Zeni, 2009). What is more, the position of AR within higher education is one of “[...] marginality and invisibility [which] makes AR teaching efforts fragile and short-lived within public universities and prevents the use of AR strategies to guide necessary reforms” (Greenwood, 2007, p. 258). It is for this very reason that AR practices are rarely supported or institutionally encouraged. This research acknowledges the limitations of AR but also endeavours to implement continuous cycles of inquiry while prioritising the immediate implementation of changes in cloud subtitling tools and their classroom applications.

4. Research methodology

This section underpins the specific methods followed in this research, which aims to ascertain whether cloud tools constitute salient alternatives for the teaching of AVT practices (specifically subtitling) in higher-education environments. The study also capitalises on the possibilities created by academy-industry collaboration. When this four-year project started in 2016, no cloud-based subtitling tools were being used for didactic purposes in any of the institutions surveyed (Bolaños García-Escribano, 2018). Drawing on Saldanha and O'Brien (2014), the research was conceived following a descriptive and empirical approach to first examine the status quo of cloud subtitling in translator training settings and then test its suitability for learning and teaching purposes.

A series of steps were followed to design the experiments following the principles of AR. Firstly, a collaboration was embarked upon with both a software developing company to gain access to an online subtitling editor (i.e., OONA Tools, [oona.oonatools.tv](https://www.oona.oonatools.tv)) and a non-profit film distribution company to use authentic materials (i.e., CinemaBioscoop, [cinemabioscoop.eu](https://www.cinemabioscoop.eu)). Secondly, a series of subtitling workshops (henceforth, the *experiments*) was designed to use the online subtitling tool in academic settings¹. Thirdly, data was gathered from experiment attendees to gauge their perceptions, which were subsequently analysed using statistical analysis software (R

¹ The questionnaires were anonymised on the UCL's cloud-based survey server (opinio.ucl.ac.uk) and thereafter did not require any informed consent as they did not compromise personal information. Risk of personal information leaks was deemed minimal as the respondents were not asked any personal information.

and SPSS). Finally, suggestions were shared with the relevant stakeholders, and the subsequent experiments were modified according to the participant-generated feedback and in-class observations.

To obtain quantitative and qualitative data, an anonymous questionnaire was distributed after the experiment. Information was also gleaned from the in-class observations made while the session was conducted. For findings to be “[...] sufficiently authentic (isomorphic to some reality, trustworthy, related to the way others construct their social worlds) that I may trust myself in acting on their implications” (Saldanha & O’Brien, 2014, p. 28), as well as to enhance validity and representation, the research was conducted across four academic years in different higher-education settings across Europe.

The first cycle of inquiry (i.e., the preliminary study) previously aimed to shed light on the teaching of subtitling online and with cloud-based platforms (Bolaños García-Escribano, 2018), or rather the lack thereof. The second cycle of inquiry (i.e., the pilot study) took the form of a face-to-face experiment, conducted with students who used a cloud-based subtitling editor in a real-life teaching scenario, to elicit subtitling trainees’ opinions on the pedagogical potential of cloud subtitling. The pilot study (N=77) was used to validate the research methodology and test the research objectives on which this paper reports. It facilitated the third cycle of inquiry (i.e., the subsequent case studies), conducted between 2017 and 2019 and consisted of another ten experiments that were continuously improved following AR ethos. This paper solely focuses on the pilot study of the AR cycles.

4.1 Experiment setup

The experiment was conceived as a situated learning experience (González-Davies & Enríquez-Raído, 2016), echoing project-based and socioconstructivist approaches. It therefore comprised semi-authentic tasks (Kiraly, 2000) in the form of a hands-on subtitling workshop run as part of the Dutch Student Days (alcs.ac.uk/student-days), held at University College London (UCL), UK, in late March 2017. This workshop, attended by over 77 undergraduate students of modern languages, was funded by the Association of Low Country Studies (ALCS) in partnership with four UK universities (Newcastle, Nottingham, Sheffield, and UCL) and the Embassy of the Netherlands in the UK. The non-response error also occurred in this survey, and the final number of valid surveys was lower than the number of participants, as illustrated in Table 1:

Table 1: Details of the pilot study

| STUDY | DATE | HOST INSTITUTION | LEARNING SETTING | PARTICIPANTS |
|--|---------------|------------------|---------------------|--------------|
| Pilot | 23 March 2017 | UCL, UK | Subtitling workshop | 77 |
| Total number of in-class participants (N) | | | | 77 |
| Total number of questionnaire responses received | | | | 54 |
| Incomplete or invalid questionnaire responses | | | | 8 |
| Final number of valid questionnaire responses (n) | | | | 46 |

Source: Author



The attendees subtitled 12 short films for a Dutch-language festival held shortly after the experiments. The participants, who had little experience in subtitling let alone professional translation, were given a theoretical introduction to (interlingual) subtitling, after which they had to produce subtitles from Dutch into English. The materials used were short films produced by independent Dutch filmmakers, which were then compiled and curated by the Dutch film association CinemaBioscoop. Their work was closely monitored by several subtitling trainers who assisted attendees throughout the experiments, and the subtitled short films were screened as part of a subsequent cinema festival held at the RADA Studios in London, UK.

The contents and materials consisted of 48 pre-timed subtitle templates produced from 12 short films by two Dutch-speaking professional subtitlers and a film distributor following standard industry practices (see e.g., Nikolic, 2015; Georgakopoulou, 2019). Each subtitle template was assigned to four groups (of 3–4 students each) to foster teamwork and arrange peer-review exercises. During the in-class time, which lasted for around five hours (including a break), a short theoretical introduction (1 hour) was followed by a step-by-step tutorial on cloud subtitling (1 hour) and two practical exercises. In the first exercise, students were prompted to perform an error-spotting exercise on the text-timing tool (30 minutes); in the second exercise, students completed a template-translation task on the translation tool (1 hour), followed by a peer-review activity (1 hour).

The first exercise prompted participants to identify errors in the pre-timed subtitle template. The clip lasted less than one minute and was extracted from Jens Rijdsdijk's (2014) *These Dirty Words*. The template contained ten subtitles that included a variety of errors: unconventional layout and position, inadequate reading speed values, poor segmentation and timing, and subtitle lines with too many characters, among others. The participants had to re-spot some parts of the clip to better accommodate the dialogue; for instance, by merging or dividing subtitles or altering the in or out timecodes so that subtitles followed utterances closely.

In the second exercise, participants translated one of the pre-timed subtitle templates from Dutch into English. Each template contained an average of 20 to 30 subtitles. Each team had previously received a copy of the short film they had to translate so that they could familiarise themselves with the clip in general and the dialogues in particular. Upon completing the translation task, a peer-review activity was arranged so that each team proofread another team's translation and provided feedback. Students were then instructed to send their subtitle files to the workshop organisers. The two Dutch-speaking professional subtitlers who had previously produced the subtitle templates were responsible for merging the files and subsequently burning the subtitles onto the corresponding clips in preparation for the screening.

Students were asked to complete an online questionnaire (32 questions), which proved fundamental to finetuning the experiment's contents and teaching methods for the following sessions. The results of the pilot study (see Section 5) informed the subsequent AR cycle (see Bolaños García-Escribano, 2023), which aimed to shed further light on the perceptions of cloud subtitling while devising actions to improve the tool in order to make it more pedagogically sound. The student feedback also concerned the logistics of the experiment (e.g., duration, theory-practice balance, printed materials, reasonable adjustments of difficulty level, length of clips and subtitle exercises, and teamwork). These elements were revisited accordingly.



4.2. Sample description

Experiment attendees were mainly female (32, 70%), with 24 (52%) respondents older than 21 years old. Almost half of the participants (22) were 20 or younger. This is significant since many would not have had significant hands-on translation experience. All participants were undergraduate students in modern (foreign) languages: 33 (72%) from Sheffield University, 6 (13%) from UCL, 4 (9%) from Nottingham University and 3 (7%) from Newcastle University. They all had Dutch as a common foreign language in their studies. As this research does not focus on language learning, respondents were not required to specify their proficiency in Dutch, nor were they tested in their production or reception abilities.

Over half of the respondents (24, 52%) had studied practical translation as part of their curricular studies at their home university, and a few participants (10, 22%) had received some kind of subtitling training. Since subtitling is often taught at postgraduate level, this eventuality had been previously conjectured. As over three-quarters of respondents (36, 78%) had not received any subtitling training, their responses were expected to be of great interest to ascertain whether cloud-based subtitling platforms can be valuable ecosystems for training beginners and inexperienced linguists.

5. Results

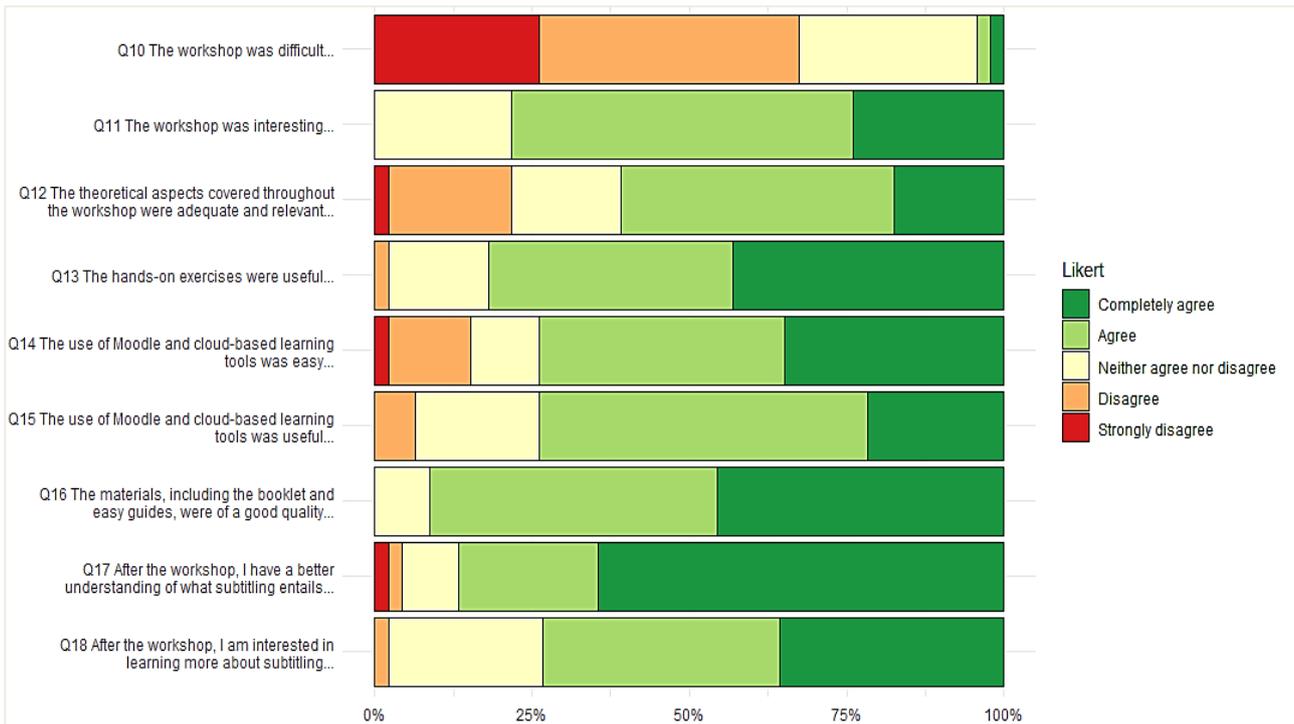
The pilot study aimed to gauge the participants' perceptions of cloud subtitling and set the stage for further case studies in AR cycles. The statistical analyses of the qualitative and quantitative data shed light on the respondents' ($n=46$) preferences and led to several action points being drawn up for the subsequent experimental cycles. The results presented in the below sections are relevant inasmuch as they confirm that participants and other stakeholders perceived this type of experiment as relevant, exciting and suitable for learning how to subtitle on the cloud. A Shapiro-Wilk test was performed on non-descriptive questions in SPSS, which revealed that the responses to all questions were non-parametric, with p -values systematically lower than 0.05.

5.1. Perception of the experiment (teaching delivery and content management)

For the AR cycles to be consonant with the objectives of the research, participants were asked about their perception of the workshop in terms of content, delivery and materials. The Likert plot in Figure 1 below demonstrates that most respondents *agreed*, or *completely agreed*, with the statements presented in questions 11 to 18 on the questionnaire. This exemplifies the respondents' overall satisfaction with the workshop in terms of content and format.



Figure 1: Likert plot for questions 10 to 18



Source: Author

The high medians for questions 11 to 18 (see Table 2) correspond to the respondents' favourable agreement with each statement. Question 10 has a significantly lower median because participants disagreed that the workshop was challenging, so this is a positive outcome too. The standard deviation and variance values show a slight disparity among participants.

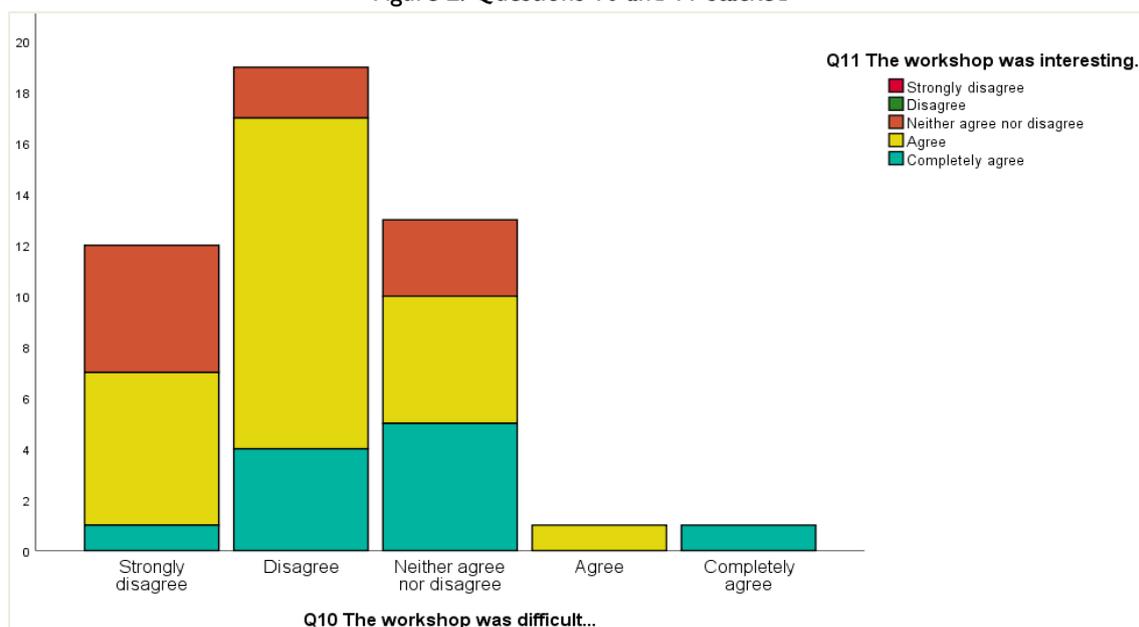
Table 2: Average, median, standard deviation and variance for questions 10 to 18

| QUESTION | MEAN μ | MEDIAN M | STANDARD DEVIATION σ | VARIANCE σ^2 |
|----------|------------|----------|-----------------------------|---------------------|
| Q10 | 2.13 | 2 | 0.91 | 0.83 |
| Q11 | 4.02 | 4 | 0.68 | 0.47 |
| Q12 | 3.54 | 4 | 1.07 | 1.14 |
| Q13 | 4.23 | 4 | 0.8 | 0.64 |
| Q14 | 3.91 | 4 | 1.09 | 1.19 |
| Q15 | 3.89 | 4 | 0.82 | 0.68 |
| Q16 | 4.37 | 4 | 0.64 | 0.42 |
| Q17 | 4.44 | 5 | 0.92 | 0.84 |
| Q18 | 4.07 | 4 | 0.84 | 0.70 |

Source: Author

The vast majority of respondents (31, 67%) did not perceive the workshop as being *difficult*, whereas 13 (28%) claimed it was *neither difficult nor easy*, and only 2 (4%) respondents found it *difficult*. None of the respondents considered the workshop uninteresting – 25 (54%) *agreed*, and 11 (24%) *strongly agreed* it was interesting. Yet, 10 (22%) respondents expressed a more cautious opinion by *neither agreeing nor disagreeing*. As outlined in Figure 2 below, most respondents (34, 74%) who found the workshop interesting *disagreed* or *strongly disagreed* that it was *difficult*. This outcome was somewhat expected inasmuch as students are believed to build up their learning on their interests and emotions (González-Davies, 2004).

Figure 2: Questions 10 and 11 stacked

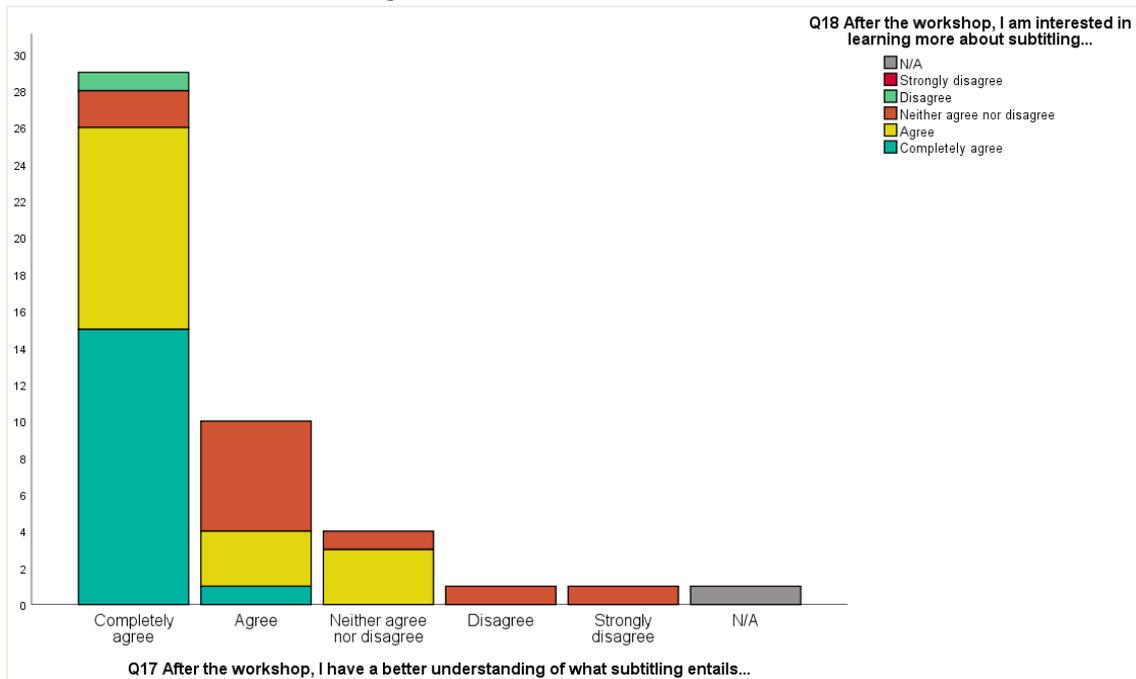


Source: Author

As for the hands-on exercises, most respondents found the hands-on exercises *very useful* (19, 41%) or *useful* (17, 37%), whereas only one (2%) respondent did not find them of use, and another 7 (15%) *neither agreed nor disagreed* that the exercises were useful. There were some comments that template translation was not considered a subtitling-specific activity since it only involved text translation in the subtitle editor. Interestingly, the materials and instructions distributed among the participants were considered to be of *good quality* by 42 (91%) respondents, whereas 4 (9%) respondents *neither agreed nor disagreed* with their quality. This finding was also crucial as the decision was taken to maintain the general layout and content of the materials. The booklet and easy guides, which included step-by-step instructions with screenshots, text-timing tips, and segmentation and line breaks examples, were deemed appropriate and useful. However, the overall duration of the theoretical introduction elicited criticism, as argued by one respondent: “The lecture part was far too long. I would have instead spent more time doing stuff rather than listening for so long. A lot of it wasn’t really relevant even though it was interesting”.

Another ten respondents included similar comments, arguing that “the theoretical section was a bit too long” or that it “included too much unnecessary information [...] in comparison to the practical side”. This input triggered changes in designing subsequent workshops, in which theory was significantly shortened and adjusted. As shown in Figure 1, most respondents (39, 85%) *completely agreed* or *agreed* to have achieved a better understanding of subtitling at the end of the workshop, whereas 4 (9%) *neither agreed nor disagreed*, 2 (4%) *disagreed*, and 1 (2%) did not answer the question. Furthermore, 33 (72%) respondents *completely agreed* or *agreed* they were interested in learning more about subtitling, whereas only 1 (2%) respondent explicitly *disagreed* that they would like to learn more, and 11 (24%) claimed that they would *neither agree nor disagree*, but one respondent failed to answer this question. When compared, these figures offer interesting insights because 30 (65%) participants reported having gained a better understanding of subtitling and being more interested in this discipline, as shown in Figure 3.

Figure 3: Questions 17 and 18 stacked



Source: Author

It could be argued that the better the understanding participants gained, the more likely they were to pursue further subtitling training. Having said that, a small proportion of respondents who were not sure they had attained a better understanding of subtitling also expressed a will to continue learning more about it. However, Likert-type questions offer little room for qualitative analysis, so respondents were given the opportunity to elaborate further in an open-ended question. As revealed by the respondents' input, the session was perhaps too focused on theoretical and professional aspects of subtitling, which were considered irrelevant and of little use to some attendants. For instance, a participant argued:

The workshop was very interesting and I now have a better idea of what subtitling entails and the limitations which can challenge subtitlers. Perhaps the initial presentations could have been shorter with regard to subtitling info that was less specifically relevant to the task so that some more time could be dedicated to explaining the software so the session could run a bit smoother.

With regards to the videos, most participants found the short films to be *very suitable* (20, 44%) or *suitable* (22, 48%), with a very small proportion of participants claiming that they would not consider them *either suitable or unsuitable* (4, 9%). Previous research has already reported on the didactic benefits of using short films as teaching materials in the foreign-language classroom (López-Cirugeda & Sánchez-Ruiz, 2013), whereas the use of edited short film scenes seems to prevail in AVT training (Dorado & Orero, 2007; Bartoll & Orero, 2008; Matamala, 2008). Whether short films

or film excerpts, videos shorter than ten minutes are often preferred to longer videos, especially at an early stage, as claimed by Talaván (2010, 2011).

Responses were more heterogeneous vis-à-vis the organisation and logistics of the workshop. While 8 (17%) participants *completely agreed* and 24 (52%) *agreed* that the contents were well organised, a small proportion of participants (4, 9%) did not consider these to be satisfactory enough. As several respondents reported their discontent with the amount of time devoted to theory to the detriment of the practical exercises, satisfaction is understandably lower than expected. Students did not comment on the films in the open-ended questions.

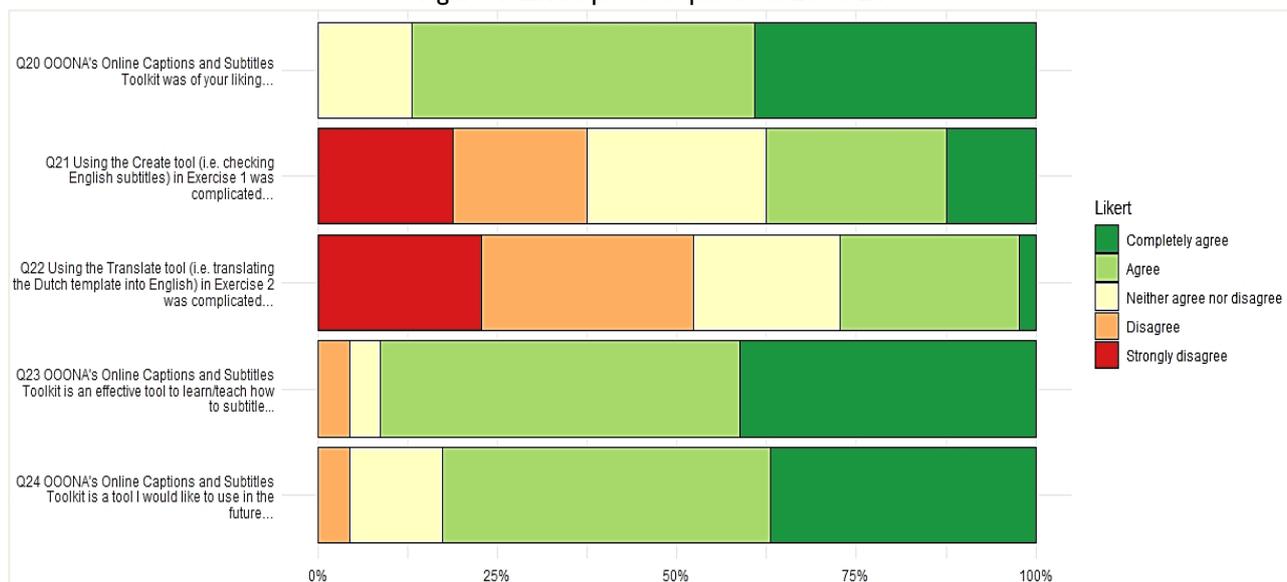
Unfortunately, no post-screening questionnaires were distributed, so this is another avenue worth pursuing in future. Indeed, would-be subtitlers' satisfaction may understandably increase once they have been exposed to the tangible outcome of their work (i.e., the translated short films on the screen).

5.2. Perception of cloud subtitling

Respondents were asked to complete five Likert-type questions to elicit their perception of the cloud-based subtitling platform and its pedagogical potential. Although there are standardised tests available for research on software usability – see e.g., Brooke's (1996) system usability scale – the nature of the sample and the context of the experiment were taken into account when producing an ad-hoc questionnaire. The questions were therefore simplified and placed greater emphasis on whether the tool was suitable for learning purposes.

The responses to questions 20 to 24 revealed higher standard deviation and variance values (Figure 4).

Figure 4: Likert plot for questions 20 to 24



Source: Author

The values shown in Table 3 show that overall mean and median values remain steadily high, except for question 22, because the low values assigned to it were *easy* and *very easy*, which ought to be considered equivalently positive in this context.

Table 3: Average, median, standard deviation and variance for questions 20 to 24

| QUESTION | MEAN μ | MEDIAN M | STANDARD DEVIATION σ | VARIANCE σ^2 |
|----------|------------|----------|-----------------------------|---------------------|
| Q20 | 4.26 | 4 | 0.68 | 0.46 |
| Q22 | 2.43 | 2 | 1.259 | 1.58 |
| Q23 | 4.28 | 4 | 0.75 | 0.56 |
| Q24 | 4.15 | 4 | 0.82 | 0.66 |

Source: Author

Respondents seemed to like the cloud-based subtitling platform *very much* (18, 39%) or *a little* (22, 48%), with only 6 (13%) respondents showing *neither like nor dislike*. The template-translation tool used by all respondents during the translation exercise was considered *very easy* by 10 (22%), whereas 1 (2%) person claimed it was *very difficult*. Almost half of the respondents found the tool *easy* (13, 28%) or *neither easy nor difficult* (9, 20%), but 11 (24%) considered it to be *difficult*.

Several respondents (16, 35%) commented that the tool was *very easy to use*. Some also claimed that its simple interface and the fact that it is browser-based were two main advantages. Other answers, however, help elucidate why some respondents could have found the tool cumbersome:

Sometimes it was difficult to find your place in the video.

It's a little bit difficult to use if I was picking it up without any help.

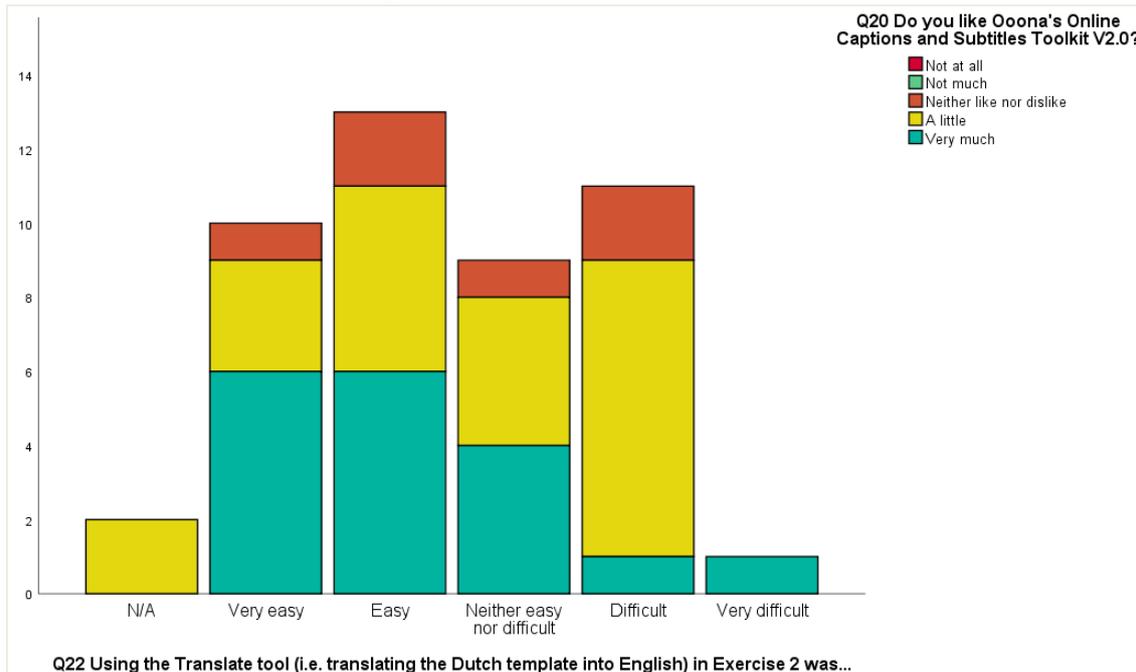
[It] was quite hard to log onto it at the beginning, but once it had loaded, all was fine.

[It was] difficult to know how to export.

[It was] complicated saving/sending.

These statements prove that more detailed instructions ought to be included in the booklet. Yet, in sharp contrast, eight respondents explicitly wrote that there was nothing that they did not like. The respondents' experience in translation and subtitling might have played a decisive role in the open-ended responses. Besides, there seems to be a slight proportional correlation between participants' level of satisfaction with OOONA Tools and perceived difficulty. Out of the 18 (39%) respondents who liked the tool *very much*, 16 (35%) found the Translate tool to be *very easy*, *easy*, or *neither easy nor difficult*, and out of the 22 (48%) who liked OOONA Tools *a little*, 14 (30%) answered in a similar vein (Figure 5). Yet, 8 (17%) respondents considered the Translate tool *difficult*, constituting a marked difference from the previous answers, which called for further attention when restructuring the subsequent AR cycles.

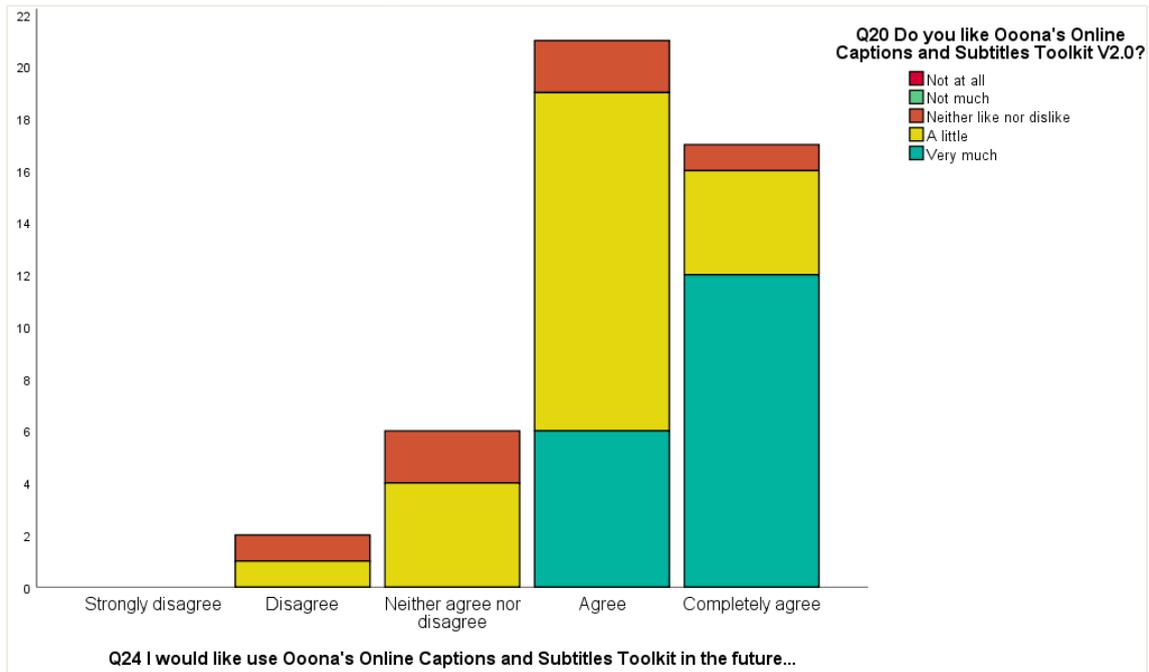
Figure 5: Questions 20 and 22 stacked



Source: Author

When asked whether or not they would consider subtitling in cloud platforms in the future, 38 (83%) answered that they would (Figure 6). In fact, only 2 (4%) respondents reported that they would not use it in the future, while another 6 (13%) remained doubtful. This result shows the respondents' positive disposition to use the tool in future. Having said that, respondents were not asked to specify whether this would be for professional or educational purposes. As seen in Figure 6, 35 (76%), participants liked the tool *a little* or *very much* while claiming that they were *likely*, or *very likely* to use it in the future. Again, participants who liked the tool *a little* (13, 28%) tended to agree that they would use it in the future, while those who liked it *very much* (12, 26%) were equally prone to agree with such a statement completely. As obvious as this may seem, the results are a testament to the overall satisfaction as regards the online subtitling tool.

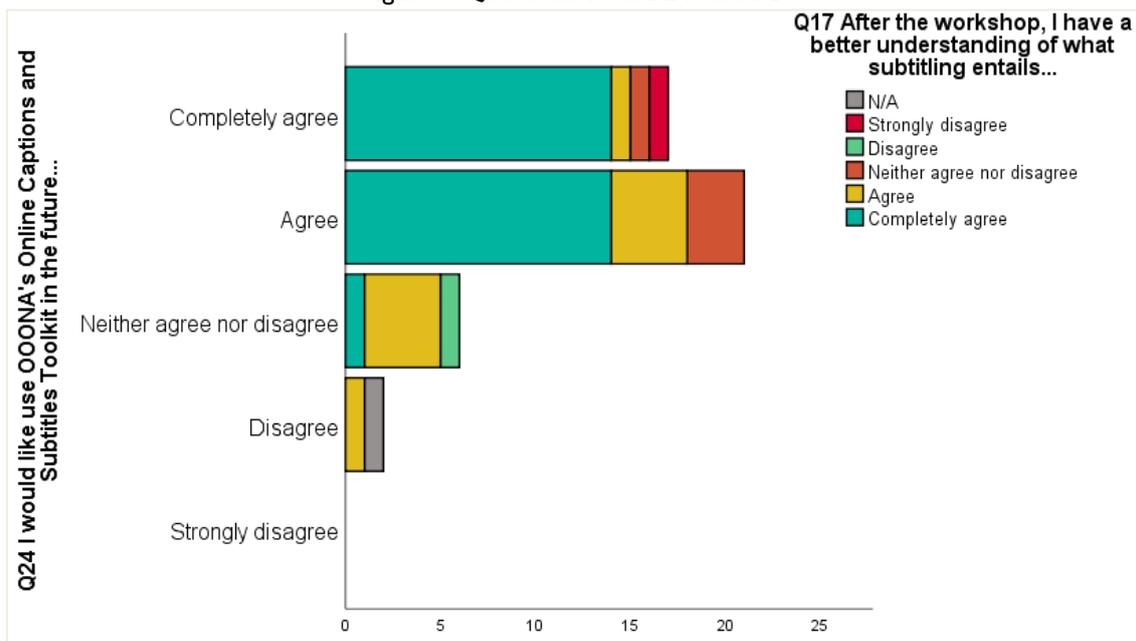
Figure 6: Questions 20 and 24 stacked



Source: Author

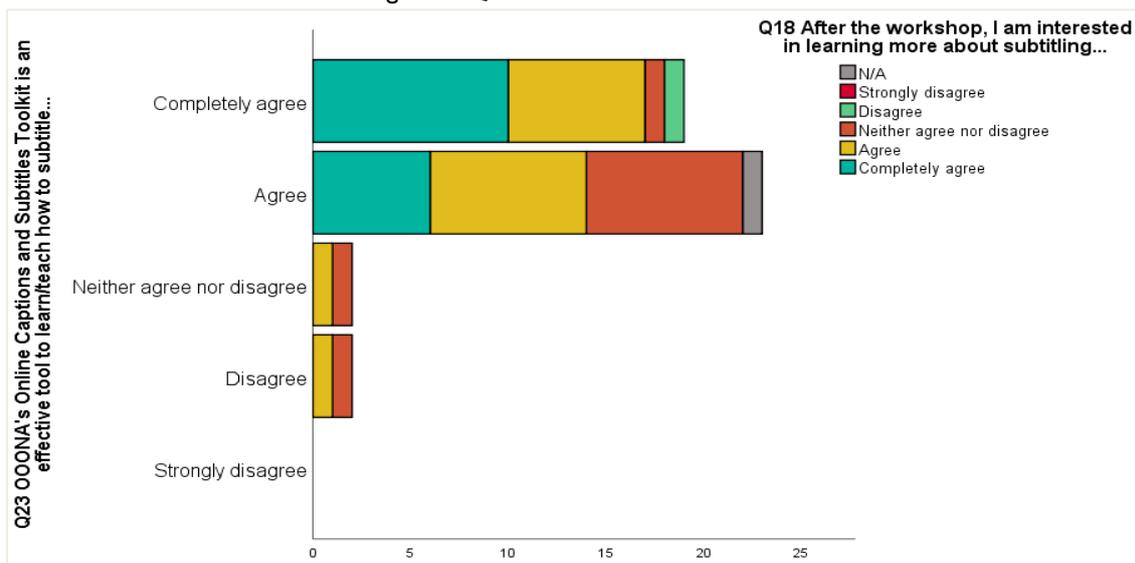
There is a visible correlation between the questions on the future use of cloud subtitling and the post-workshop understanding of interlingual subtitling practices. Indeed, 33 (72%) respondents who had gained a better understanding of subtitling in the workshop also expressed their willingness to use cloud-based subtitling platforms in the future (Figure 7). Similarly, the vast majority of participants (42, 91%) claimed that the online subtitling tool was useful for training purposes. Among these, 31 (i.e., 67% of all respondents) also showed an interest in learning more about subtitling (Figure 8).

Figure 7: Questions 17 and 24 stacked



Source: Author

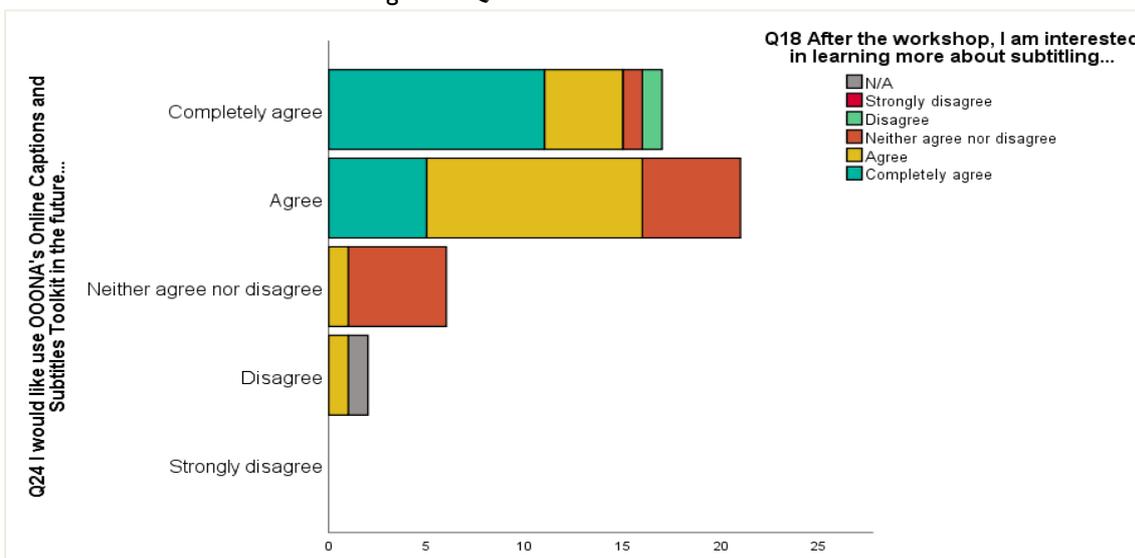
Figure 8: Questions 18 and 23 stacked



Source: Author

Along with the previous finding, Figure 9 confirms that participants interested in learning more about subtitling not only liked the tool but also found it pedagogically sound. What is more, the same number of participants (31, 67%) who expressed their willingness to learn more about subtitling also wanted to use cloud subtitling tools in the future.

Figure 9: Questions 18 and 24 stacked



Source: Author

Students were asked to express their views on cloud subtitling openly. The most prominent characteristic was the user-friendliness and overall ease of use of the online subtitling platform: 16 (35%) responses included the word *easy*. Indeed, only 3 (7%) respondents claimed that the software was *difficult to use*. Several respondents found the whole experience enjoyable and fun; some even pointed out that beginners would benefit from learning to time text in cloud ecosystems. However, the respondents also reported on problems, among which were:

It was a little restricted in its features. Also [sic] sometimes frustrating because it is browser based so misclicks etc were dangerous.

Inability to edit time in and time out.

Couldn't change timings.

When you click on the box and you go accidentally to the bottom line of the subtitle but there's no way of telling "sometimes it didn't synchronise.

Sometimes it was difficult to find your place in the video.

Difficult to know how to export.

Complicated saving/sending.

Lagging before every subtitle makes it difficult to check timing.

It is not easy to ascertain whether the above-mentioned issues were caused by the tool's deficiencies or the participants' lack of sufficient training. When it comes to timing text (also known as spotting), adjusting in and out timings and checking them against the video player is a bottleneck frequently experienced by trainees and early-career subtitlers alike. It transpired, however, that the subsequent workshops and easy guides had to place greater emphasis on the use of shortcuts for text-timing purposes.

6. Discussion: integrating action into the ongoing research

The reflections elicited by the participants' experiences led to multiple reconfigurations and customisations of the subsequent instances of cloud subtitling training. From an AR-led teaching perspective, this process provided learning opportunities and food for thought to further finetune the didactic applications of cloud subtitling. Specifically, the results informed the next AR cycle as follows:

- (1) Cloud subtitling workshops were extended but contained less theoretical content. The longer the experiments were, the more pre-subtitling content and complex text-timing exercises they could accommodate. In the subsequent workshops, either theory or text-timing activities were curtailed depending on duration and specific needs.
- (2) Despite the complexity of the exercises, participants could produce template translations for screening purposes in the pilot study. As this is a motivating learning outcome, situated learning experiences with authentic materials were continued when possible.
- (3) Cross-referencing between real-life case scenarios and subtitling theory were improved. The materials contained a new section on best subtitling practices and case scenarios with authentic examples.



- (4) Satisfaction is not always directly proportional to the participants' perception of how difficult or easy cloud subtitling is. Subtitle template creation and translation tools had to be explained in further detail depending on their background knowledge and experience. Some of the participants who enjoyed the experiment also wanted to learn more about subtitling and reported a higher appreciation of the tool both in pedagogical terms and for future personal use. Therefore, it follows that a learning tool can be a powerful means to enhance interest and stimulate knowledge building.
- (5) The duration of the video clips that participants are expected to subtitle has to be proportionally equivalent to the time devoted to the hands-on exercises in class. Although AVT educators often prioritise shorter videos, the open-ended answers revealed that some advanced participants considered that translating templates of approximately 20 subtitles was not challenging enough. Activities ought to be more easily customisable (e.g., ready-made or empty templates) depending on the participants' background knowledge and the in-class time allotted to each task.
- (6) Teamwork was deemed appropriate by the participants. Following a project-based, situated approach, situated assignments comprising semi-authentic subtitling tasks continued to be encouraged.

Additionally, the correlations discussed in Section 5.3 provide evidence that subtitling trainees are often eager to continue working on a tool already used in the classroom, especially when this is the tool to which they are first exposed. The affective link between the student's learning experience and software exposure suggests an enthralling field of research in the psychological aspects of translator training.

After student-generated feedback was provided to the industry partner, several changes were introduced, including the default set of shortcuts being replaced with those used in legacy desktop-based software such as Screen Systems' Wincaps Qu4ntum. A new interface was also developed, integrating innovative features (e.g., interactive audio waveform). The swift changes introduced by the software developers meant that the materials and subtitling tasks had to be updated accordingly for each of the subsequent experiments. These changes, however, legitimise the nature of this AR study, whose ultimate aim is to embrace research-led translator education and keep up with industry innovation.

The analyses discussed in this paper helped to draw conclusions that informed the reshaping of the subsequent experiments in terms of content, configuration, format and teaching delivery to address the bottlenecks experienced by most respondents and action tool-specific improvements. Such changes proved pivotal in the subsequent cycles of inquiry, which lasted for two more years, between May 2017 and June 2019, and involved a total of 347 participants from different higher-education institutions across Europe. During this time, each experiment was nurtured by the results of its predecessor; what is more, each learning experience was adapted to each higher-education institution and student cohort to better meet the needs of the participants undertaking subtitling training. Amendments were made to data-collection methods and materials in the subsequent experiments. The study experiments' questionnaire was edited to reflect the changes triggered by this AR cycle. Among the main changes were more qualitative questions, which were deemed helpful to better gauge the participants' opinions beyond the limitations of Likert-scale questions, as well as



a significant reduction in the number of quantitative questions, which were halved. There were two open-ended questions that prompted respondents to write an account of the use and applications of cloud subtitling.

These results, as well as those discussed in Bolaños García-Escribano (2023), are exemplary of how AR methods can be used to inform classroom practice and stimulate trainer-trainee collaboration as well as to promote reflection on the uses of cloud technologies in subtitler training environments.

7. Concluding remarks

In a technologically driven AVT industry, cloud (eco)systems have acted as catalysts for groundbreaking changes in how audiovisual content is localised. In 2016, prior to the start of this exploratory research, there were no records of (published) research being conducted on cloud subtitling training among AVT scholars, and nor were there any studies that utilised AR methodologies for this purpose (see Bolaños García-Escribano, 2020). In this paper, it is argued that cloud subtitling is becoming a common practice in the industry and ought to feature more prominently in subtitler training environments.

This article has reported on a pilot study involving over 75 participants who were exposed to cloud subtitling during a situated learning experience. Participants were shown semi-authentic, professional subtitling practice using a web-based subtitling tool, thereby situating the learning and echoing industry trends. They thereafter produced a tangible output, that is, the translations of the short films that were screened at a local cinema festival hosted by the Association for Low Country Studies and CinemaBioscoop at the RADA Studios. High levels of satisfaction and an apparent fondness for cloud subtitling were reported in the post-experiment questionnaires. Most respondents ($n=46$) remained positive about the pedagogical potential of cloud subtitling and its future use outside the classroom. According to their responses (discussed in further detail in Section 5), the performance of the selected online subtitling tool was deemed very good overall by the respondents, who systematically remained optimistic about its potential use in the subtitling classroom. This suggests cloud subtitling holds enormous potential to teach subtitle translation among inexperienced subtitlers. A clear link has also been established between the classroom use of particular tool and the trainees' willingness to continue using said tool in future.

The experiment elicited constructive criticism among participants, and it soon became clear that the cloud subtitling tool offered room for improvement. The industry partner seemingly employed the user-generated feedback to finetune certain functions of the professional tool. Soon after the conclusion of this study, an educational version of the cloud subtitling tool was launched, which has been adopted by other higher-education institutions (see oona.net/clients), meaning that other subtitling instructors are visibly keen to foster academia-industry collaborations. Many other software developers and media localisation companies, arguably driven by the assumption that future professionals are eager to stick to the software with which they were trained during their studies, now offer free use of their online revoicing and subtitling editors to AVT trainers and trainees (see, e.g., XTRF, YellaUmbrella and ZOO Digital's ZOO Academy). The nature and effects of this (now commoner) business practice remain to be further explored, nonetheless.



The eagerness shown by industry partners to collaborate with trainers is paramount to continue fostering AR studies in AVT education. This type of methodology, based on cycles of experimentation, produces enriching learning opportunities for trainees and trainers. AR projects, however, do not often have a conclusive end. For instance, cloud ecosystems still call for a leaner integration of learning-specific components and applications to make them more pedagogically satisfying. In future, cloud-based subtitling tools could be integrated into dedicated educational platforms by finetuning certain aspects such as access, interface and work modes. As argued in this paper, maintaining close collaborations between translator training centres and industry partners has the potential to address the latest teaching needs effectively.

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