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CAT teaching practices: an international survey

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ABSTRACT

This article analyses the way CAT teaching is carried out in higher education institutions, based on the findings of a survey distributed to CAT tool teachers from around the world. The survey was set up on *Typeform,* an online survey platform, and remained open from 15 December 2017 to 15 December 2018. We received 120 responses by 102 participants from 112 institutions in 33 countries and regions. The findings suggested that tutorials, where students are told how to operate a CAT tool, were the most prevalent teaching method, although some learning-by-doing activities were adopted. The survey results also indicated that CAT tool training should be linked more closely to practical translation sessions and could be more intellectually stimulating. These results call for a wider debate on the status of CAT in the translation curriculum and on how it should integrate with other subjects. More empirical research is also required to examine integrated teaching methods that make it easier to stimulate competent use of translation technologies as well as their broader conceptual implications.

KEYWORDS

Computer-assisted translation, CAT, translator training, translation pedagogy, CAT teaching, translation technology.

1. Introduction

Translation practice has grown to be a technology-dependent and increasingly technology-driven activity. It is widely believed that without knowledge of contemporary translation technology, graduates of university translation programmes will not meet the demands of the expanding language industry (Kenny 2019). The teaching of computer-assisted translation (CAT) has become a key element of translation pedagogy over the last decade. For example, the European Master's in Translation (EMT) Competence Framework recognises being able to use CAT tools as part of the skills expected of translators (European Commission 2017:9). Topics such as industry practices, instructor[1] profiles, teaching materials and curriculum design are often discussed in the CAT teaching literature (e.g. Doherty and Moorkens 2013; Bowker 2015; Chan (ed.) 2010, 2015; Kenny 1999; Pym *et al*. (eds) 2006; Austermühl 2013; Enríquez-Raído 2013; Kornacki 2018). However, to date, there has been less substantial international analysis of how CAT is taught. The purpose of this article is to document and analyse the way CAT teaching is carried out in higher education institutions. The findings are based on a survey distributed to CAT tool teachers from around the world. The survey was set up on *Typeform,*

an online survey platform. It remained open for a year, from 15 December 2017 to 15 December 2018. In total, we received 120 responses[2] by 102 participants from 112 institutions in 33 countries and regions[3]. While most responses were from Europe, the results reflected a wide international spread and are hoped to provide insight into how this subject is taught in different regions. We present findings on instructors' profiles and perceptions of CAT teaching, the mode of teaching delivery, the size of teaching groups, the tasks of the instructor, assessment methods, and teaching styles.

In the remainder of the article, we first provide a brief literature review. We then describe the survey methodology and present the results. The article concludes with a series of observations on the implications of different CAT teaching methods and directions for future research on the teaching of this subject.

2. Literature review

Much of the existing literature addressing CAT teaching concentrates on curriculum design. Previous work on this topic identifies teaching materials, learning outcomes, and assessment methods (e.g. Doherty and Moorkens 2013; Rodríguez-Castro 2018; Chan (ed.) 2010, 2015; Kenny 1999; Pym *et al*. (eds) 2006, Enríquez-Raído 2013). In terms of teaching methodologies, Secară *et al*. (2009) propose blended teaching and learning methods in translation technology training, bringing together selected features of online and face-to-face training. They consider the blended approach beneficial in improving the educational experience of both trainers and trainees. In addition, Alcina *et al*. (2007) promote a socio-constructive task-based approach to translation technology training, which has been implemented by Mileto and Muzil (2010) in teaching CAT tools to expose students to simulated real work conditions. Rodríguez-Castro (2018) also adopts task-based learning as a teaching methodology and experiments with virtual reality simulation. In addition, Killman (2018) advocates a context-based approach to introduce translation memory in translator training, while Starlander and Morado-Vazquez (2013) reflect on their experience of teaching students to evaluate CAT tools using the EAGLES 7-step recipe (1999), one of the deliverables of the Evaluation of Natural Language Processing Systems project.

Regarding teaching strategies and priorities, Sikora (2014) recommends introducing theoretical aspects first before shifting the focus to the practical application of technologies in translation projects to consolidate students' knowledge. Shuttleworth (2017:34) suggests that CAT teaching should ensure that the students obtain a comprehensive understanding of how the technology works through learning several different CAT tools. He considers this approach helpful for the students to grasp innovative features from

several tools, which facilities the development of the students' ability to master and evaluate a new tool promptly and competently. Austermühl (2013: 334), on the other hand, places less emphasis on teaching students how to use new types of CAT tools. His focus is, instead, on how technologies allow students to optimise meta competences, such as revision skills and documentary research skills. Enríquez-Raído (2013: 277) believes that training of translation technology should be "relegated neither to a specific course on the subject nor to translation practice courses alone," which echoes Pym (2013), who proposes using the various technologies available to translators wherever possible in training. Pym (2013: 494) argues that students should not learn just one tool step by step, but rather to develop the ability to learn how to learn, which includes the skills of:

1) reducing learning curves (i.e. learn fast) by locating and processing online resources
2) evaluating the suitability of a tool in relation to technical needs and price
3) working with peers to solve learning problems
4) critically evaluating the process or working with the tool.

The importance of these skills is emphasised by several other scholars (e.g. Alotaibi 2014; Austermühl 2013; Marshman and Bowker 2012).

In terms of overall patterns in CAT teaching practice, Rothwell and Svoboda (2019) report and compare the results of two surveys, namely the 2012 survey conducted in the EU-funded OPTIMALE project, and a re-run of the same survey by the EMT Network in 2017. The two surveys investigate which technological competences are delivered and in which way they are taught in European postgraduate translator training programmes. The OPTIMALE 2012 survey received 50 responses, and the EMT 2017 survey received 55 responses. These responses correspond to approximately three-quarters of EMT member programmes at the time. They reflected a European perspective on the subject. Rothwell and Svoboda's study suggests that CAT tool teaching became more closely integrated with the teaching of practical translation. In terms of teaching styles, learning through staff-led teaching (staff lecture/demonstration) was the most used pedagogical approach. This was considered essential or very important by 80% of the respondents (2019: 43).

Although the language industry is increasingly globalised and standardised — for example, with guidelines from several ISO standards[4] — educational conventions and degrees of access to CAT technology may vary across regions. The current literature covers CAT teaching practices in several countries, including the USA (e.g. Rodríguez-Castro 2018), the United Kingdom (e.g. Shuttleworth 2017), Poland (e.g. Sikora 2014), Russia (e.g. Ivleva and Melekhina 2018), Ukraine (e.g. Olkhovska 2017), Spain (e.g. Šanca 2018), Greece (e.g. Kalantzi 2002), Saudi Arabia (e.g. Alotaibi 2014), China (e.g. Yao 2017; Zhou and Gao 2016), Switzerland (e.g. Starlander and Morado-Vazquez 2013), Italy (e.g. Mileto and Muzil 2010), Ireland (e.g.

Doherty and Moorkens 2013) and Canada (e.g. Marshman and Bowker 2012). It is worth noting, however, that research with a European focus on the implementation of CAT teaching in translation programmes still predominates. Practices in other regions, especially Asia, Africa, and South America, are examined and debated less often. It is thus worthwhile to investigate how CAT tools are taught across countries and whether teaching practices differ depending on the context. We, therefore, adopted an international perspective in this study.

Furthermore, the existing scholarly discussion on this subject emphasises primarily *what* should be taught. It predominantly defines the skillsets and competences the students are required to obtain, course structures and assessments. However, to date, there has not been a systematic international analysis of *how* CAT tools are taught. This is, therefore, also part of the research desiderata the present survey is hoped to address, especially in relation to the instructor's perceptions of step-by-step instructions on how to use specific CAT tools. Survey questions on the use of this type of instructions were linked to a separate study by the authors that observed how students with no CAT experience coped with CAT activities that minimised instructions by the teacher on how to use a given tool (Vieira *et al*. 2021).

3. Methodology

In line with our objective of documenting CAT teaching practices, our survey design was intended to accommodate a wide range of circumstances. The survey had 19 questions (Q). Some of these were more directly concerned with the individual respondents (Q1-Q4, Q18-Q19), including questions on their prior experience (Q1), their perceptions of different teaching styles (Q2-Q4), their view on ideal CAT teaching styles (Q18), and comments on the survey (Q19). The survey also had questions for which responses could vary based on the institutions where the teaching took place (Q5-Q17). These included questions on information about their institutions (Q5-Q7), the teaching delivery mode (Q8), the size of teaching groups (Q9), the tasks of the instructor (Q10, Q11), the teaching activities (Q12), and assessment methods (Q13-Q17). Since the same instructor could work at more than one institution at the same time, respondents could complete institution-related questions up to two times based on two separate institutions where they were employed at the time of taking the survey. Institution-related questions, therefore, had more responses than questions that were more closely related to the instructor.

To ensure a consistent understanding of key terms used in the survey, we provided preliminary definitions that helped focus the scope of the survey. CAT tool teaching referred to "any teaching activities involving CAT tools taking place at an academic institution (e.g. a university or college)". CAT

tools were defined as "tools that allow translations to be produced/edited with the use of features such as translation memories, term bases and machine translation (e.g. SDL Trados Studio, MemoQ, Lilt, Memsource, Wordfast, among others)".

The link to the survey was shared online on academic translation mailing lists and social media channels. As previously mentioned, the survey remained open from 15 December 2017 until 15 December 2018. During this period, we also sent out calls for participation to CAT teachers who worked at institutions that participated in the academic programmes of SDL Trados Studio[5] and MemoQ[6], two major CAT tools on the market with extensive public directories of partner institutions. We report on the full survey below in the next section, where we present and discuss the findings[7].

4. Research findings

By the closing date, we received 120 responses by 102 participants from 112 institutions in 33 countries and regions. This section reports on and discusses all questions in the order they appeared in the survey.

In addition to reporting the full results for each question, we also group the responses according to teaching group sizes and instructors' level of teaching experience, namely those with more than five years' experience and those with five years' experience or less. We select these grouping factors because they are straightforward to measure with precision and because they are likely to be important determinants of different teaching practices. We note, however, that especially in relation to differences between subsets where the numbers are smaller, our results are exploratory. They are intended to generate hypotheses and document snapshot patterns that can be revisited in future surveys and research.

Q1 How long have you been involved in CAT tool teaching?
- Less than 1 year
- 1 year
- 2 years
- 3 years
- 4 years
- 5 years
- 6-10 years
- more than 10 years

Most of the participants had extensive experience in teaching CAT tools. As shown in Figure 1, of the 102 participants, 74 (72.55%) had five years'

experience or more in CAT tool teaching, of whom 31 (30.39%) had more than ten years of experience.

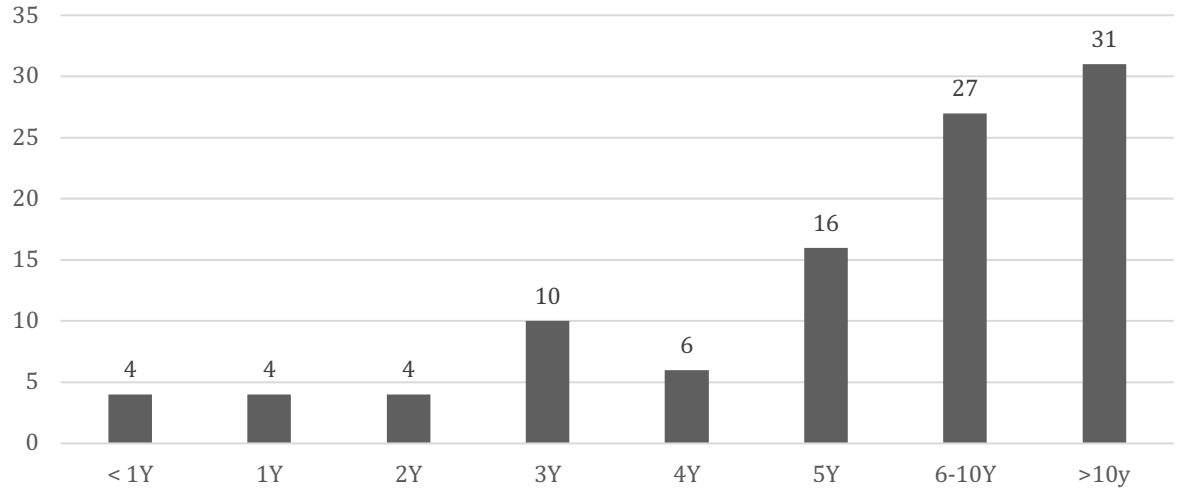

Figure 1. Instructors' teaching experience (Q1, N=102)

After the question on the level of CAT teaching experience, we asked the participants to share their views on three statements, which were presented as separate questions. We group these below as Questions 2-4.

> Questions 2-4: We are going to ask your opinion on a few statements. Please choose an alternative between 1-strongly disagree and 5-strongly agree.
>
> Q2: I feel that without tutorials where students are told how to perform specific tasks in CAT tools, they would not be able to use these tools effectively.
> Q3: I feel that CAT tool teaching could be more intellectually stimulating.
> Q4: I wish students could learn the basics of CAT tools independently to make room for more activities based on analysis and discussion.

We designed these statements to obtain information from instructors on how, in their view, CAT might differ from other subjects in the translation curriculum and on how they felt about approaches to the teaching of this subject that may be less reliant on step-by-step instructions. As mentioned previously, the statements stemmed from a separate study by the authors. In this other study, we provide an empirically informed discussion of the merits and feasibility of increasing student autonomy in the early stages of CAT teaching (Vieira *et al*. 2021).

The first statement was designed to gather participants' opinions on students' reliance on tutorials. By tutorials, we referred to a teaching approach where students receive direct instructions (e.g. where to click) from teachers on how to perform specific tasks in a CAT tool. The level of agreement with the first statement is presented in Figure 2. The answers show that 60.78% (62) of the participants agreed with that statement, of whom 25.49% (26) strongly agreed. This indicated that tutorials were perceived as a necessary method by many of the participants, who tended to be uncertain about the possibility that students could learn how to use a CAT tool effectively on their own. When looking at the data more closely, teachers with six years of teaching experience or more tended to disagree slightly more with this statement. Of teachers in this group, 6 out of 58 (10.35%) disagreed and 4 (6.9%) strongly disagreed.

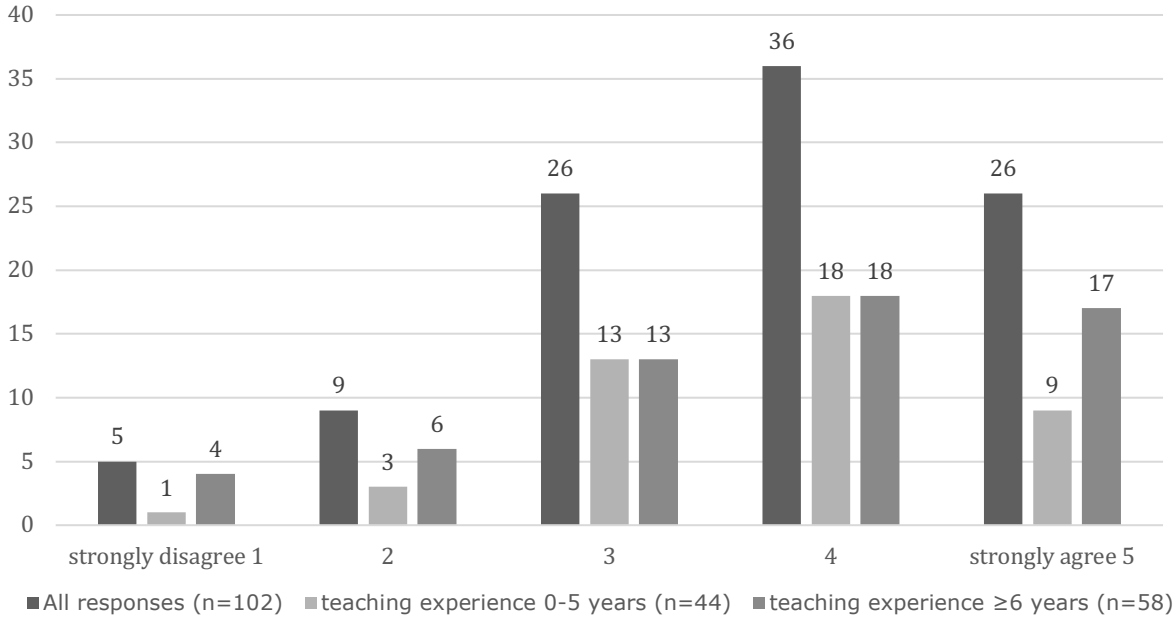

Figure 2. Results for the statement of Question 2: "I feel that without tutorials where students are told how to perform specific tasks in CAT tools, they would not be able to use these tools effectively." (Q2, N=102)

The statement in Question 3 was designed to gather data on whether the tutors believed CAT tool teaching differed from other subjects in the translation curriculum in relation to the intellectual stimulus. The statement was motivated by inherent differences between some subjects in the curriculum, on the one hand, and practical aspects of CAT, on the other. Translation theories, for example, is one of the typical modules in translator training where great emphasis is placed on critical thinking and analysis without necessarily involving procedural aspects of how to use specialised software or a specific tool. CAT modules, by contrast, may be perceived to have a stronger focus on technical skill. The results, as shown in Figure 3, demonstrated that 64.7% (66) of the participants agreed with that statement. Among them, 33.33% (34) strongly agreed that CAT tool

teaching could be more intellectually stimulating. Teachers with five years or less of teaching experience tended to agree slightly more with this statement than the average, with 68.18% (30) agreed, of whom 36.36% (16) strongly agreed.

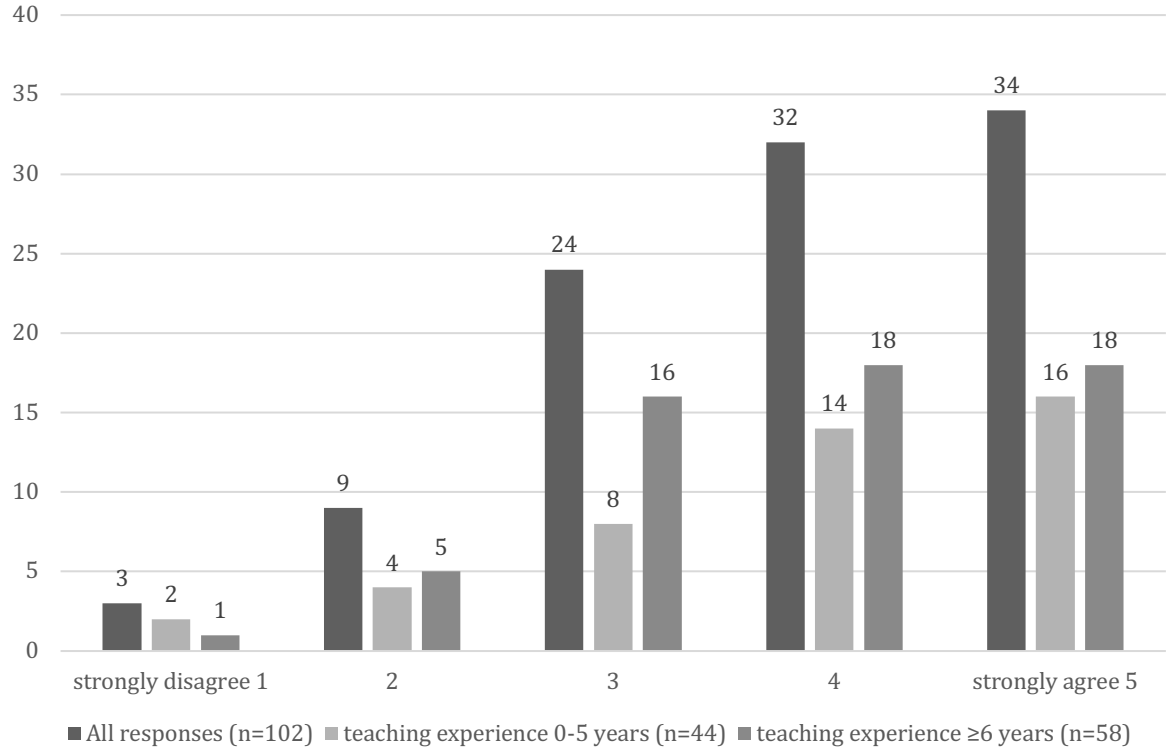

Figure 3. Results for the statement of Question 3: "I feel that CAT tool teaching could be more intellectually stimulating." (Q3, N=102)

The statement in Question 4 was intended as a follow-up question to the previous statements. It aimed at gathering the participants' viewpoints on whether they wished their teaching to be less tutor-centred (i.e. based on tutorials) and more student-centred (i.e. based on self-learning/exploration). The results, as presented in Figure 4, showed that 47.06 % (48) of the participants agreed, and among them, 23.52% (24) strongly wished that students could learn the basics of CAT tools independently to make room for more activities based on analysis and discussion. Of those who had five years or less of teaching experience, 61.36% (27) agreed with that statement, and among these, 29.55% (13) strongly agreed. The agreement percentage was lower among tutors who had six years' experience or more: 36.20% (21) agreed, of whom 18.97% (11) strongly agreed with the statement. These results echoed the results concerning the first statement, which indicated that tutor-led teaching approaches were perceived by many as crucial. More independent student-led activities were strongly desired, but most of the respondents were not confident that the students would manage to learn CAT effectively without receiving technical instructions on how to operate a CAT tool.

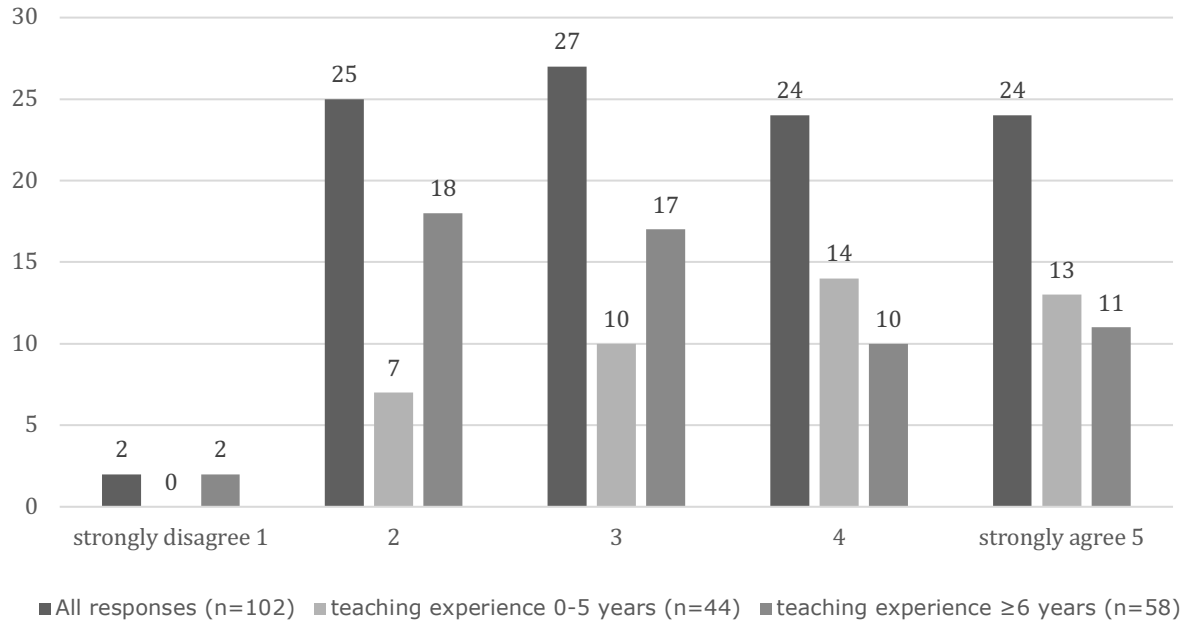

Figure 4. Results for the statement of Question 4: "I wish students could learn the basics of CAT tools independently to make room for more activities based on analysis and discussion." (Q4, N=102)

Q5 Are you currently involved in CAT tool teaching in more than one institution?

- Yes
- No

As mentioned in the Methodology, the survey allowed participants to report on teaching practices pertaining to up to two separate institutions. This addressed the fact that teaching practices may need to be adapted depending on institutional factors such as class size, curriculum design and teaching facilities. Question 5 checked if a second set of institutional questions was required. Of the 102 participants, 84 (82.35%) taught in one institution only, while 18 participants (17.64%) were employed by more than one institution. Of these 18 instructors, three taught in two countries. There was an instructor who taught in both Germany and France. Another one taught in Antigua and Barbuda as well as Burma, and another one taught in both Saudi Arabia and the United Kingdom. This type of cross-border teaching was a clear indication of how the higher education workforce is globalised.

Overall, there were 120 institution-level responses, which corresponded to 112 different institutions. Below we present results for all such responses, including the double answers from those who worked at more than one institution as well as answers from different respondents who worked at the same institution.

Q6 In what country/region is the academic institution where you teach?

As explained earlier, we set out to obtain an international account of different CAT teaching approaches. Despite our attempts to distribute the survey as widely as possible, some countries and regions were more represented in the sample than others. This may simply reflect a lower response rate in some parts of the world. To some extent, it may also reflect actual regional differences in the amount of CAT teaching provision – with fewer translation programmes in North America compared to Europe, for instance – though based on this survey alone, this cannot be confirmed. The top ten countries with the most responses are presented in Table 1.

Country/Region	**Responses**	**Percentage**
China	21	17.5%
Spain	12	10%
United Kingdom	11	9.17%
Germany	10	8.33%
Poland	6	5%
Belgium	5	4.17%
France	5	4.17%
Turkey	5	4.17%
Austria	4	3.33%
United States	4	3.33%

Table 1. Top ten countries with the most responses (Q6, N=120)

Q7 What is the name of the academic institution where you teach?

As mentioned above, we had responses from different teachers who worked at the same institution, which is one of the reasons why we deemed it important to ask participants to identify their institutions. While participants were aware, the survey asked for institution names, and while they had a chance to anonymise their response to Question 7, because of length restrictions and to avoid indirectly identifying participants, we do not provide the full list of academic institutions here.

Q8 What is the delivery mode of your CAT tool teaching?
- Campus-based
- Distance-learning
- Other

As information and communication technologies advance, higher education translation programmes can nowadays be undertaken by distance learning. There may also be distance-learning CAT courses provided to higher education institutions by CAT tool companies or other industry organisations. We, therefore, designed Question 8 to investigate CAT teaching delivery modes, with a particular interest in the degree of prevalence of distance learning as an official mode of delivery. The Question may not have been interpreted as strictly as intended, however, as participants from institutions that at the time the data was collected did not offer distance-learning programmes selected both 'campus-based' and 'distance-learning' in their response. The results in this respect, therefore, reflect the nature of the teaching, which for a campus-based programme may also have included distance-learning activities. Across all responses, 115 (95.83%) included campus-based teaching, among which 15 (13.04%) also included distance learning[8], and five responses suggested that they taught CAT tools by distance-learning only. Our survey findings echo results presented by Rothwell and Svoboda (2019), which suggested a modest shift towards e-learning among EMT programmes.

Q9 What is the usual size of your CAT tool teaching groups?
- 26 or more
- 21-25
- 16-20
- 11-15
- 5-10
- Fewer than 5

Teaching group size can be an essential factor in the pedagogical approaches adopted. Question 9 was designed to provide insight into typical group sizes. The results suggested that the number of students in CAT tool teaching groups varied considerably, as shown in Figure 5. Of all responses, 34 (28.33%) mentioned group sizes between 16 and 20 students, and 45 (37.5%) mentioned sizes greater than 20 students. There were also smaller groups: 25 (20.83%) responses mentioned sizes of between 11 and 15 students, and 13 (10.83%) mentioned sizes of between 5 and 10. Sizes may be determined by classroom capacity and the number of available computers and CAT tool licences, which might differ across countries and institutions. In some institutions, there may also be a cap on the size of a group due to pedagogical considerations. Another potential determining factor in the size of groups is the overall number of students on the programme.

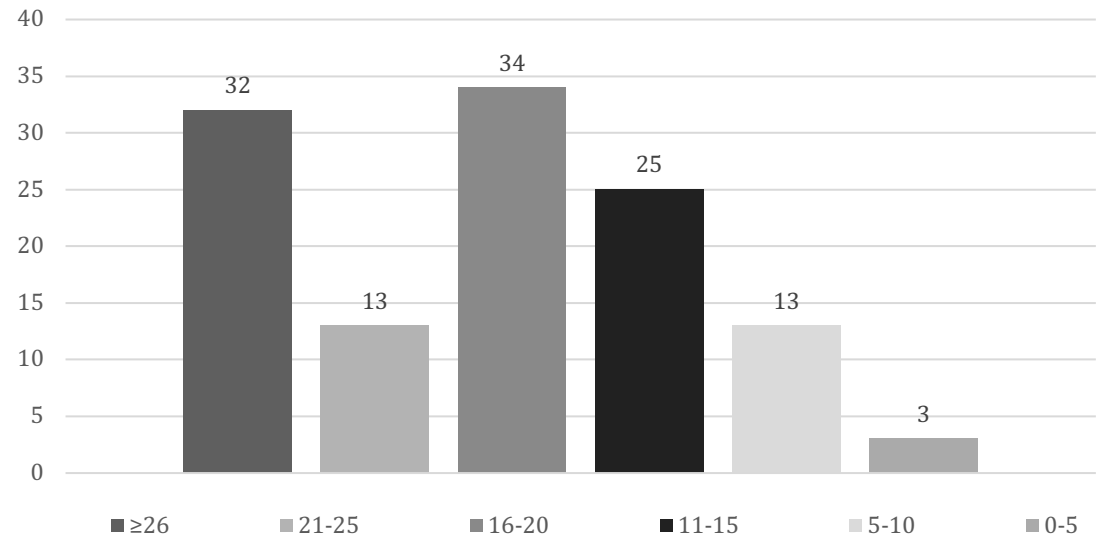

Figure 5. Sizes of CAT tool teaching groups (Q9, N=120)

Q10 Please choose the alternative that best describes you.
- I am employed by an academic institution
- I am employed by a translation company and provide training to students at academic institutions
- I am employed by a CAT tool developer and provide training to students at academic institutions
- Other

Question 10 was designed to enquire about the nature of the institutions that employed the CAT tool instructors. The results, as shown in Figure 6, showed that 86.67% of the responses (104) indicated that instructors were directly employed by an academic institution. This figure was higher among the instructors who worked for one institution only (92.85%, 78 out of 84). Additionally, three responses indicated that instructors were employed by a translation company, and one instructor was hired by a CAT tool developer. Notably, eleven responses chose the option "Other", where they did not consider themselves to fall into any of the first three scenarios. Among them, ten suggested that they taught CAT tools on a self-employed basis, including five freelance translators and five part-time instructors. Two implied that they worked for companies that had language services departments rather than translation companies. Although most of the CAT instructors were directly employed by academic institutions, their profile was therefore diverse. These results also suggest some degree of collaboration between industry and academia in CAT tool teaching.

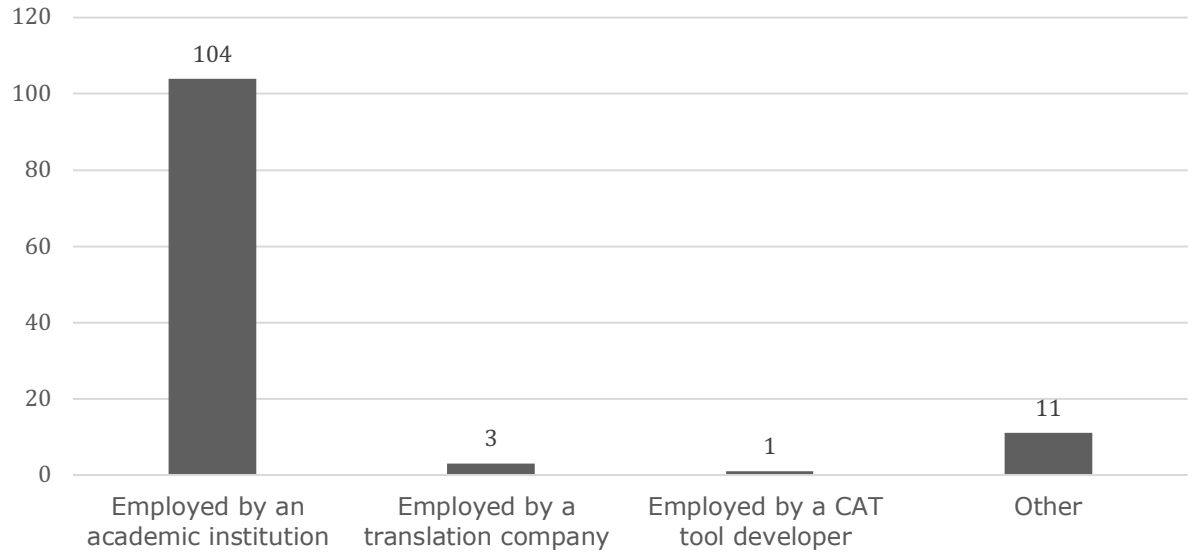

Figure 6. Employment status of CAT tool instructors (Q10, N=120)

Q11 Please choose all tasks comprised by your role
- Assessment
- Course design
- Practical sessions
- Lectures without hands-on activities
- Other

Question 11 explored the tasks comprised by the role of a CAT tool instructor. The results are presented in Figure 7. Assessment (110, 91.67%), course design (110, 91.67%), and practical sessions (109, 90.83%) were selected more than 90% of the time. By contrast, participants selected lectures without hands-on activities 73.98% (91) of the time. This suggested that most of the respondents were in charge of course design, as well as teaching and assessment. We note, however, that this does not necessarily reflect the totality of activities carried out at the institution since the question was designed to capture the role of the teachers. For example, some of those who gave lectures without hands-on activities might not have been involved in assessment, course design, and practical sessions. In addition to the alternatives provided, seven respondents selected "Other" and mentioned that their roles could also include internship supervision, administrative tasks, research, external examining, and coordination of independent and group work.

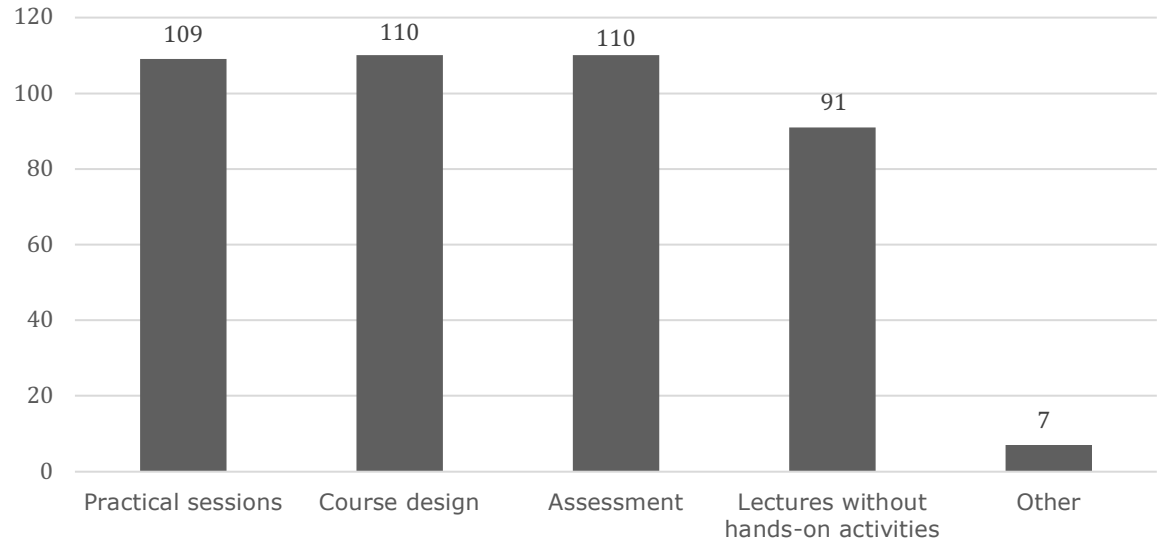

Figure 7. Tasks comprised by the role of CAT tool instructors (Q11, N=120)

Question 12: Of the CAT tool teaching activities in which you are involved, how much is based on... (the participants are given four options: much, some, little, none).

1) Tutorials where students are told how to perform specific tasks in a CAT tool (e.g. by being told where to click)?
2) Activities where students learn by doing and do not receive direct instructions on how to perform specific tasks?
3) Group discussions, but only after students have followed tutorials or been told how to use specific CAT tools?

Question 12 was designed to capture the nature of teaching activities used in CAT tool classes. As illustrated in Figure 8, 43.33% (52) of all participants reported that *much* of the teaching was based on tutorials where students receive direct instructions on how to operate a specific tool, while 40% (48) of them suggested that *some* of their teaching was based on this type of instructions. We note that those who reported smaller group sizes tended to make more use of tutorials of this nature. Of tutors who taught groups with fewer than 15 students, 48.78% (20) reported that much of their teaching involved tutorials, while this figure was 37.5% (12) among those who taught groups with more than 26 students. Furthermore, instructors with five years or less of teaching experience also reported more significant reliance on tutorials: 48.94% (23 out of 47) reported *much* use. By contrast, 39.73% (29 out of 73) of those who had more than 5 years of teaching experience selected *much* in response to this question. Notably, three instructors reported that *none* of their teaching was based on this type of tutorials.

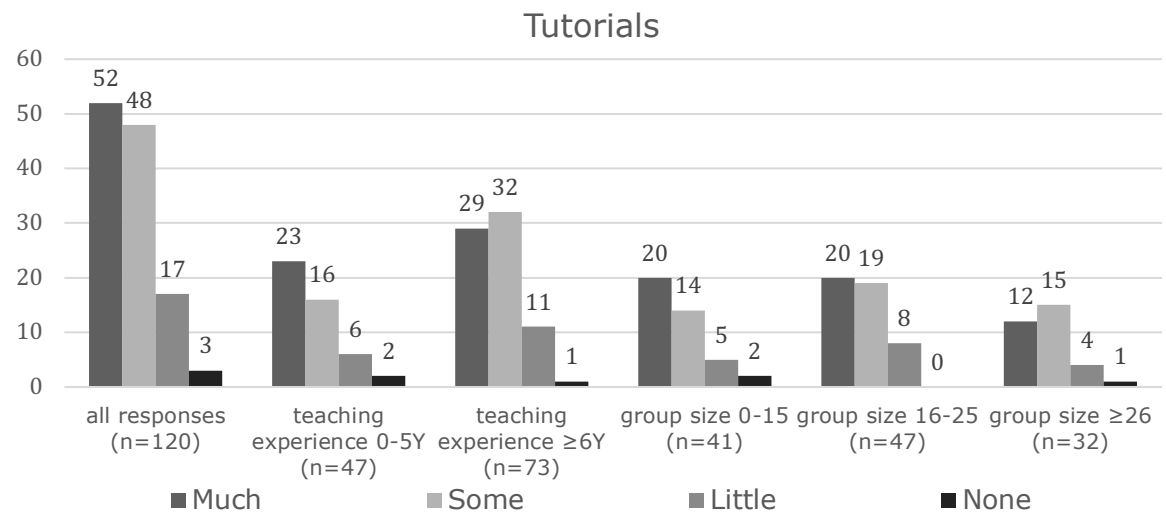

Figure 8. Teaching activities based on tutorials (Q12-1, N=120)

As illustrated in Figure 9, 53.33% (64) of the responses reported that the teaching involved *some* activities where students learn by doing and do not receive direct instructions on how to perform specific tasks, while 20% (24) suggested *much* of their teaching was based on this approach. This indicated that some learning-by-doing activities described in Question 12 were adopted three-quarters of the time, showing some level of emphasis on student autonomy (see Lesgold 2001). The results also suggested that this approach was *much* used in 28.13% (9) of cases where instructors reported teaching groups with 26 students or more. Teaching experience was not a prominent factor in these responses, except that 8.22% (6) of teachers with six years or more of teaching experience reported that *none* of their teaching was based on this approach. These results demonstrate that 'learning-by-doing' activities have been widely applied in CAT teaching.

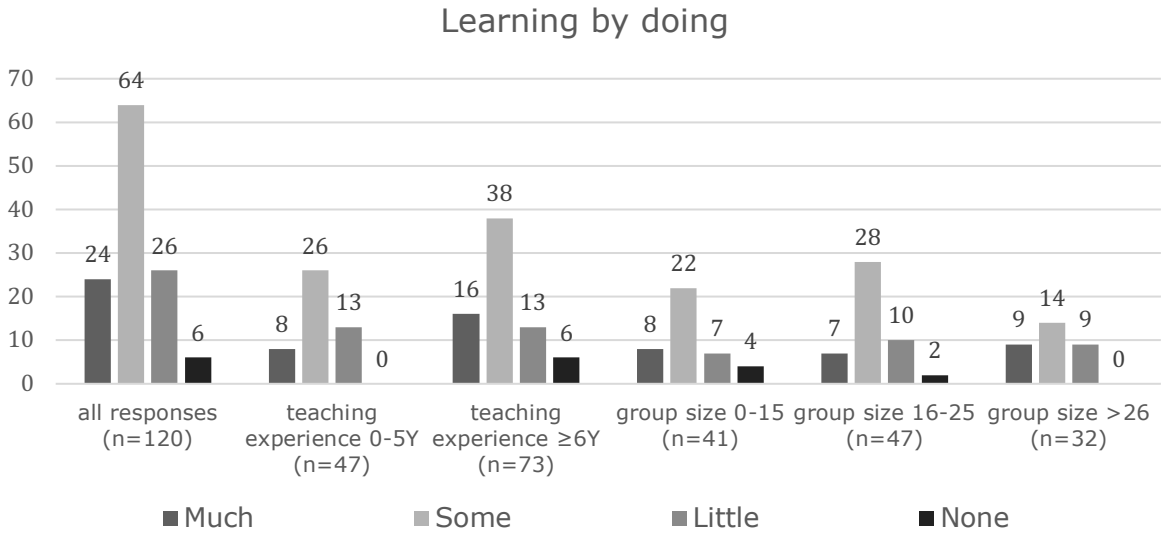

Figure 9. Teaching activities based on 'learning by doing' (Q12-2, N=120)

Regarding group discussions, as illustrated in Figure 10, 44.17% (53) of the responses reported *some* use of this format*,* and 26.67% (30) reported *much* use. Based on these results, group discussion was used the most in the teaching of groups of 16 to 25 students, which corresponded to 29.78% (14) of responses that reported *much* use and 42.55% (20) of responses that reported *some* use. Among those who have five years or less teaching experience, 53.19% (25) declared that they included *some* group discussion, while the figure among those who have six years of experience or more was a little lower at 38.36% (28). This suggested that group discussions were preferred by newer instructors.

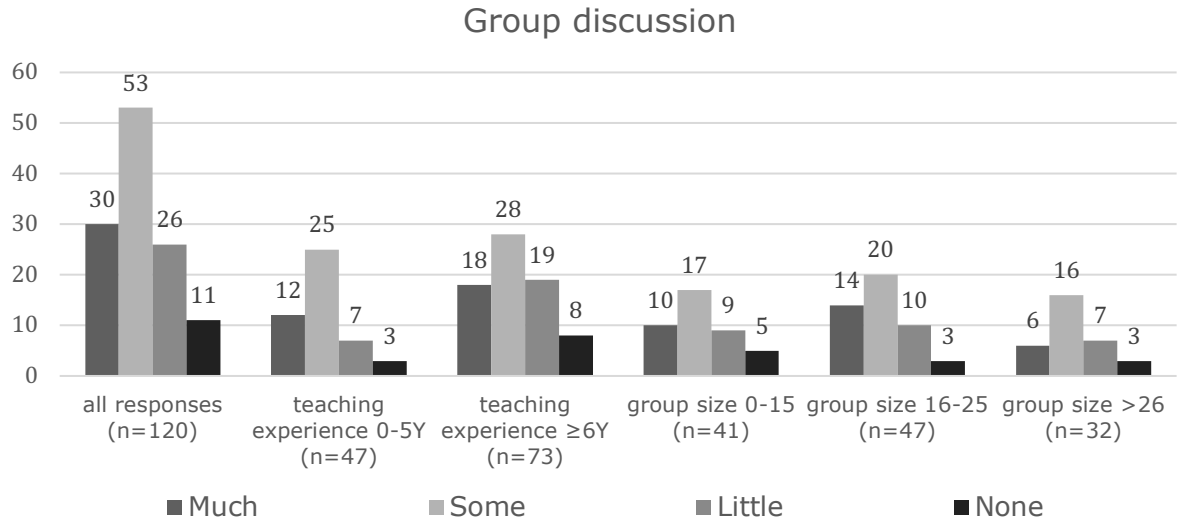

Figure 10. Teaching activities based on group discussion (Q12-3, N=120)

Of the three methods mentioned in Question 12, as shown in Figure 11, tutorials were the most popular one among *much* used methods, followed by group discussion. Meanwhile, three-fourths (64) of the responses mentioned adopting *some* learning-by-doing activities.

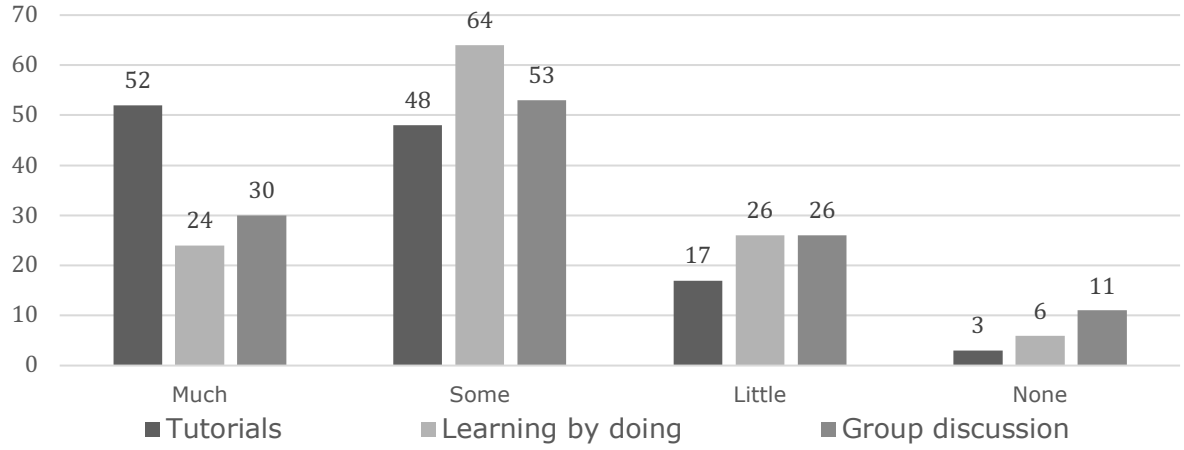

Figure 11. A comparison of the three teaching activities (Q12, N=120)

Q13 Is students' learning of CAT tools assessed?
- Yes
- No

We then moved on to enquire about issues related to assessment. Results for Question 13 (N=120) showed that 81.67% (98) of responses indicated that students' learning of CAT tools was assessed. This constituted the majority. Among the 18.33% (22) of responses indicating students were not assessed, ten responses were provided by five participants who worked at two institutions and who were either self-employed or directly employed by a company rather than an academic institution. This suggested that external instructors were less involved in assessment practices.

Q14 How do you assess students' learning of CAT tools?
- Translation project in a CAT tool
- Essay
- Exam
- Other

Among the responses reporting that students' learning of CAT tools was assessed (N=98), as shown in Figure 12, 92.86% (91) indicated assessments based on a translation project in a CAT tool, which was the most prominent assessment method. Essays and exams were reported in 36.73% (36) and 38.78% (38) of the responses, respectively. Other assessment methods included learning progress diaries or reports, a compilation of term bases, self-analysis of work methods and assessment practices based on simulated translation bureaus.

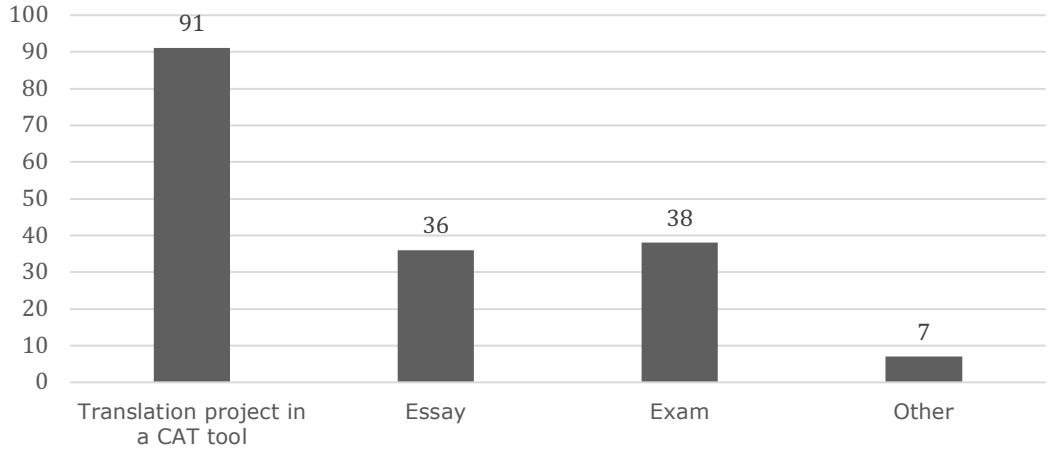

Figure 12. Assessment methods (Q14, N=98)

Q15 Are translated documents produced by students in a CAT tool evaluated at any point?
- Yes
- No

Question 15 examined how translations produced by students in CAT classes were treated in relation to assessment. Responses to this question (N=120) suggested that in almost one-third of cases (39, 32.5%), the quality of students' translations was not assessed in CAT tool teaching. In terms of CAT teaching and learning, this indicated a potential disconnect between the procedure of using a CAT tool and the translation output produced in it.

Q16 What does this evaluation take into account?
- Translation accuracy, linguistic quality or adherence to a translation brief
- The satisfaction of a client (e.g. company or NGO) who collaborates in the teaching
- Desktop publishing and formatting consistency
- Other

Among those who evaluated target documents (N=81), as shown in Figure 13, translation accuracy, linguistic quality or adherence to a translation brief were selected as criteria 91.35% (74) of the time. Desktop publishing and formatting consistency were slightly less common criteria, selected by 69.14% (56) of the participants. The satisfaction of a client (e.g. a company or an NGO) who collaborates in the teaching was selected in 38.27% (31) of responses. Among assessment criteria mentioned in Other responses were the use of the tool itself (creating usable and error-free TMs and term bases), interoperability, invoicing (including leveraged word counts), reflection on the use of the tool, appropriate application of tools and utilities, independent problem solving, capacity to work in a team, looking for potential clients, use and production of adequate terminology, and peer assessment of group work. While these assessment criteria do not necessarily concern the assessment of translation quality, they are relevant in evaluating the expected learning outcomes of CAT tool teaching.

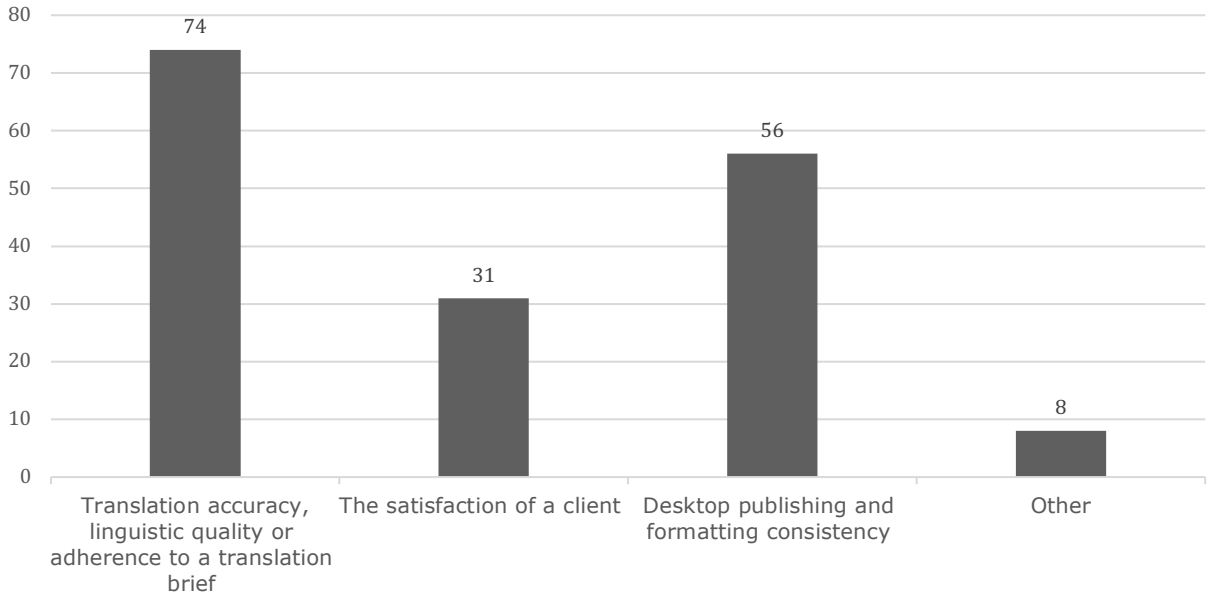

Figure 13. Evaluation criteria (Q16, N=81)

Q17 Does this evaluation count towards a mark or grade?
- Yes
- No

When the target document was evaluated, this counted toward a mark or grade in 87.65% (71) of responses (N=81).

Q18 Please describe in your own words what in your view would be the ideal teaching style for CAT tools.

In addition to the structured questions presented above, we invited the participants to write freely about their thoughts on CAT tool teaching in an open question. This question received 88 answers. Hands-on practice was the teaching method mentioned most frequently in 61 (69.32%) of the open responses. Among these, 27 responses mentioned project-based learning; 11 suggested that the practical sessions should be real-life tasks or projects, ideally commissioned by a client in the industry; and seven believed that hands-on practice should involve group work.

Tutorials were the second most frequently mentioned method. This method appeared in 35 open responses, of which 24 supported teaching styles involving both tutorials led by the instructors and hands-on practice led by the students. Additionally, 17 participants suggested self-learning approaches in which the students explore how to use CAT tools without

direct instructions from the instructors. One participant commented that "[w]ith the advance of new technologies for translators, students can easily learn how to manage them by themselves" and another one suggested that CAT tool teaching should involve "[l]ess instruction by the teacher, more hands-on discovery by students".

Four participants mentioned a flipped classroom model, which, in the case of CAT tool teaching, was explained by a participant as "[s]tudents do practical practice at home and discuss the results and theoretical aspects in the class". This model has been applied in translator training (e.g. Shu 2015, Lou *et al*. 2017). To our knowledge, its application to CAT tool training has not, however, been systematically examined or discussed to date. Other comments included the use of free software or free licences, allowing students to bring their own laptops to the class, the need for a dedicated technician, and a dedicated computer lab.

At the end of the survey, we also asked the participants to comment on the survey itself (Q19). Most of the participants expressed positive opinions on the study and the questions. Many were interested in getting to know more about the research findings. We also received useful suggestions on some aspects of the survey design. Importantly, one comment suggested that the background of the students may be an important factor to consider, including age, IT proficiency, and level of study (e.g. graduate or postgraduate). While we attempted to keep the survey as short as possible for clarity and to increase response rates, these are factors that future research on this subject should take into count.

5. Discussion and Conclusion

This study surveyed how CAT tools are taught at higher education institutions in different countries. The research findings provide insights into several issues concerning CAT teaching practices.

First, tutorials, where students are told how to operate a CAT tool, are still the most prevalent method of teaching this subject, as demonstrated by the results of Questions 2, 12 and 18. Most of the instructors were not confident that the students could manage without receiving direct instructions, even though some learning-by-doing activities are already adopted. These results call for a wider debate on the status of CAT in the translation curriculum and on how it should integrate with other subjects. Arguably, CAT is increasingly not just about an instrumental set of skills, but importantly also about issues that pervade professional translation practice, from the impact of translation on commercial translation workflows to how it might affect translators' professional standing. More empirical research is thus required to examine integrated teaching methods that

make it easier to stimulate competent use of translation technologies as well as their broader conceptual implications.

As expected, the teaching methods adopted varied to some extent for different class sizes, even though, as previously mentioned, we deem differences of this nature to be exploratory. The results of Question 12 suggest that tutorials are preferred by those teaching groups of 15 students or less, whilst those teaching groups with more than 26 students tended to leave the students to explore the tools independently. Group discussions were mostly used by instructors who have 16 to 25 students in a group. One participant suggested in the comments that the "total number of students should not exceed 20". In some cases, class size may be outside of instructors' control. However, the instructors need to adopt appropriate teaching methods according to the class size and student backgrounds. There may be room for future empirical research to study the impact of class sizes on students' learning outcomes to suggest ideal or recommended class sizes for different CAT teaching activities.

Another important issue raised by the results was that CAT tool training should be linked more closely to practical translation sessions, which echoes Austermühl (2013). One participant noted that "[t]eaching CAT-tools only specifically in technology classes is not enough, those tools should also be used in translation classes to increase the proficiency of the tools but also in order to receive feedback on the final quality of the produced translations". This is a practical way of making CAT teaching more interactive and of integrating it with other contents in the translation curriculum. Bearing in mind the results of our separate study on the use of direct instructions in CAT teaching (Vieira *et al*. 2021), as well as the results from the present survey regarding instructors' perception that there is room for CAT teaching to be more intellectually stimulating, we argue that integrating CAT into different parts of the curriculum as mentioned in this open response should be strongly considered by translation programmes in case this is not already implemented.

Moreover, instructors' teaching experiences and backgrounds may affect their choice of teaching styles. As indicated by the outcomes of this survey, in comparison to instructors with more than five years of teaching experience, instructors who have taught CAT tools for five years or less tended to prefer the students to learn the basics of CAT tools independently to include more teaching activities based on critical analysis. Instructors with fewer years of experience also tended to include more group discussions in their teaching. Further research could follow up on these results to investigate whether instructors who are newer to CAT prefer different teaching styles compared to those who are more experienced.

Generally, the responses reflected diverse opinions on the ideal teaching styles for CAT. One participant rightly mentioned: "I don't think there is an ideal style. The best way to approach [this] depends on a number of factors such as 1) size of the group, 2) students' background, 3) L1-L2 combination, etc." It is true that there is no standard CAT teaching method that is suitable for all scenarios. It is nevertheless useful to revisit and adjust teaching methods based on specific situations. It is our hope that this survey generates further discussion on CAT tool teaching to improve pedagogical practices surrounding this subject.

Acknowledgements

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Notes

[1] In this article, teacher, tutor, and instructor are used interchangeably without presupposing different roles.
[2] These figures exclude a response from the authors' own institution, which seemed to have been submitted in error by a student.

[3] The 33 countries and regions are United Kingdom, Spain, Belgium, Poland, Austria, France, Finland, Italy, Russia, Germany, Ireland, Lithuania, Switzerland, Croatia, Czech Republic, Hungary, Malta, Netherlands, Portugal, Romania, Slovakia, Slovenia, Ukraine, China, Turkey, Taiwan, Brazil, United States, Puerto Rico, Saudi Arabia, Antigua and Barbuda, Burma, and Australia.

[4] For example, the ISO 17100:2015 Translation services — Requirements for translation services, the ISO 21720:2017 XLIFF (XML Localisation interchange file format), and the ISO 20771:2020 Legal translation — Requirements.

[5] For more information, please see https://www.sdltrados.com/education/partners/list.html (consulted 27.5.2021).

[6] For more information, please see https://www.google.com/maps/d/viewer?mid=12c5mWL_8HzHyhK33HkLZyspD4hs&ll=20.7170137951794%2C14.457170900000051&z=2 (consulted 27.5.2021).

[7] The study was approved by the Faculty of Arts Research Ethics Committee at the authors' institution.

[8] When answering Question 8, one participant chose the option "Other" and stated that "Distance-learning, Campus-based, Synchronous chat while students explore, compare and generalise functions and possibilities of different CAT tools". This response was provided for two institutions. We counted the two responses as both Distance-learning and Campus-based.