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Applications of technologies in T&I courses in Australia: Perceptions of T&I academics

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Abstract: The pervasive role of technology in T&I has seen unpreceded changes in teaching and learning, professional practice, and community engagement. As Neural Machine Translation and Artificial Intelligence continues to improve, so will these new technological methods and the way academics teach T&I programs. However, little is known about how and where these tools are taught in Australia. This research sets out to fill this gap. It does so by using publicly available data on university websites, as well as the perspectives of a broad range of academics obtained through an online survey, to answer these questions. While each technological approach has its limitations, there is a pressing need to understand the extent of teaching using technological tools in the Australian context, so that future translators and interpreters are better-informed in their educational choices, better equipped with the appropriate tools, and better prepared for their future as translators and interpreters in an increasingly digital age.

Keywords: T&I courses. Academic perceptions, T&I technologies, T&I courses

1. Introduction

In an increasingly techno-globalized world, the need to provide more relevant and industry applicable courses and programs in T&I is more pressing than ever. In response, educational providers have begun to include Machine Translation (MT) applications, Post-Editing (PE), Translation Memory (TM) and various other Computer Assisted Translation (CAT) tools in their T&I (T&I) programs. However, in Australia, there is currently little concrete understanding of T&I technology adoption in higher education, or of how academics perceive these technologies.

There is a paucity of papers on technological tools in T&I in the Australian context, and even fewer share information about their applications and the experiences of academics teaching in these courses. This project aims to identify the emerging trends in the use of technologies in T&I programs in Australian universities, with a view to promote further technological training in higher education. Using publicly available online information from higher education providers, we aim to outline how technologies are being implemented in T&I programs in Australia. An online survey of Translation and Interpretation (T&I) educators was also conducted to understand their views of, and attitudes towards, the effectiveness, usability, benefits, and shortcomings of these technologies.

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Surveying course offerings in Masters of T&I programs across Australia, it has become evident that the institutions reviewed all include some level of translation technology instruction in their programs. However, their offerings either a) are 'bolted on' to a curriculum as units of a course; or b) exist as a standalone course. Ideally, embedding such tools across multiple courses in the curriculum would provide a more holistic approach to T&I technologies, but this was rarely the case. The aims of this paper are twofold. The first is to determine the current applications of technologies in T&I courses in Australia, while the second is to evaluate academics' perceptions of these technologies in terms of ease of use and usefulness.

2. Background

2.1. A review of the literature

To provide a foundation for scholarly research on translation technologies in Australia, the current study first evaluates global trends, before examining the applications of T&I technologies by academics in Australia. A growing divide has emerged between the rapid developments in technology in industry practice and the scholarship and teaching on T&I in higher education institutions. The workforce is becoming ever more fragmented, with technology amplifying this effect (Moorkens, 2017). One of Moorkens' colleagues, Doherty (2016), makes a similar but perhaps a more pro-technology point when he states that "translation technologies will become even more integral in interlingual communication" (p. 947). The incremental developments in Neural Machine Translation (NMT) will slowly reduce the rate of error between the human and the machine (Johnson et al., 2017; Yamada, 2018).

In the meantime, Machine Translation devices and software are becoming commonplace, either as post-editing tools or as terminology pivot points; and while these tools are not always explicitly taught in higher education, graduates are often forced to learn to use them through collegial referral or at point of translation through the industry. As a by-product, new technologies have created new translation-related professional tasks, including localisation, post-editing, project management, and quality assessment, especially for MT output (Mellinger, 2017).

2.2. Australian emerging technology context

The first stage of our study aimed to evaluate a cross-section of Masters of T&I programs and courses in Australia. It should be stressed here that the survey was limited to a selective sample of the universities that offer T & I programs. While our examination cannot be described as exhaustive and only certain components of the syllabus that were publicly available were considered, our study provides a snapshot of current trends across various universities in Australia. The purpose was to gain an insight into the scope, style, and delivery methods of various technological courses in Australia. For instance, the University of NSW has two courses, one specifically entitled 'Translation Technology' and the other entitled 'Multimedia Translation', which have an emphasis on "cutting-edge technologies embedded in the language services in industry of today." The University of Melbourne has a broader course that encompasses various methodological approaches to T&I, including a range of technological approaches. Monash University has a course entitled 'Translation Trends in a Digital Age,' which provides deeper, workshop-based, hands-on use and application of CAT tools. The University of Western Australia has two courses, one entitled 'Corpus-based Translation Studies,' which focuses on corpus-based translation projects and uses computational software to identify new patterns in translation. The other course, entitled 'Translation Localisation,'

provides localization software practicals that cover the macro and micro cultural and social implications of technology. Others, such as the University of Queensland offer courses such as 'Technical Translation I,' which involves translation memory training.

Western Sydney University offers 'Translation Technologies', which covers Translation Memory, terminology management, Machine Translation, and CAT software applications. RMIT's 'Translation and Technology' course specifically focuses on technology for translation purposes by using translating, subtitling, editing, and formatting technologies (including MT and CAT systems). Macquarie University has a course entitled 'Technology for T&I' that focuses on the use of technologies in T&I settings, including corpora, terminology tools, and translation memories. The Australian National University's course on 'Translation across Languages' is a broad-brush course that covers a range of topics, including technical translation, machine translation, interpreting, and audio-visual translation.

2.3. Contextual factors in T&I technologies

Studies have identified an apparent disconnect between the use of Translation Memory (TM) technological tools (a database that stores segments previously translated) and Machine Translation tools (Moorkens & O'Brien, 2017). In response, some T&I higher education providers in the United States have started to use Machine Translation in their courses (Mellinger, 2017). However, greater integration across the curriculum is still needed to provide a more holistic approach to MT and TM. In the Australian context, very little is known about the current curriculum patterns of MT and their relationship to professional practice. To the best of the authors' knowledge, there has been little evaluation of current technological practices in higher education in T&I.

It is therefore important to examine which T&I technologies are currently being employed so that universities that adopt such technologies do so with an understanding of the use value for their student group (Carrió Pastor, 2016). However, the usability and adoption of these technologies in Australian universities are still relatively unexplored. A global survey of 438 freelance interpreters, translators, academics, trainers, and service providers found that there is a "strong need for an improvement in quality assessment methods, tools, and training, partly due to the large variance in approaches and combinations of methods, and to the lack of knowledge and resources" (Gaspari, Almaghout, & Doherty, 2015, p. 333). Doherty (2016) goes so far as to indicate that "translation technologies intersect and sometimes subsume the translation process entirely" (p. 963). For academics and institutions, being well equipped and aware of what is 'out there', helps to develop a more relevant syllabus and learning design. The extant literature reveals a significant gap in the understanding of the environment surrounding the use of translation technologies by academics in Australia. Hence, there is a need to understand what technologies are being used in the curriculum, and how academics perceive these technologies.

While MT is still developing and has inherent limitations, Groves & Mundt, (2015, p. 112) suggest we need to "work with, not against, such technologies". While we agree with Groves & Mundt on this point (2015), there is also a counteracting need to temper technological enthusiasm by first evaluating its usefulness and ease of use by better understanding how academics in Australia are using it. Koopenen (2016, p. 131) makes this point vividly clear by going so far as to note that some technologies are just not "worth the effort", as some errors in post-editing can be more frustrating than they are helpful. Hence, a more critical stance on CAT tools, such as TMs, is being called for in the literature, and while such tools may have increased productivity and consistency in translation, they have posed other risks to the translation process. These include, but are not limited to, reduced

autonomy, reduced remuneration, reduced control, and increased risks to the overall quality of translation outputs (Doherty, 2017).

Based on a survey of MT competencies conducted by a non-commercial and publicly funded European research project, Gaspari, Almaghout and Doherty (2015) illustrate that although the importance and value of translation technology competencies are clear, these competencies remain an underdeveloped skill set in translator education. Gaspari, Almaghout & Doherty (2015) conclude that "the impact that the familiarity with translation technology has on the employability of translation students cannot be underestimated." They emphasise the importance of "an awareness of the need for technological skills in translation and localisation professionals and their trainers." Hence, this study will evaluate the shortcomings and usability of the technologies currently adopted at Australian universities. This is the first research project in Australia to conduct such research. The findings aim to inform the current adoption of and trends in technological tools in T&I programs in Australia, and our reports on the experiences of academics using these tools will support the future development of technology courses in programs across Australia and globally.

3. Research Questions

Given the current debates around T & I technologies, the research questions underpinning our research are:

RQ1: What are the current applications of technologies in T&I courses in Australia?

RQ2: What are academics' perceptions about adopting technologies in their courses?

4. Research Design

This study adopted a mixed-method approach to investigate emerging technology-enabled T&I and academics' perceptions about using such technologies. The research design was based on the premise that individual academics have various views on the adoption of technologies in their teaching, which are socially constructed and relate to their experiences and worldviews (Merriam, 2009). The research adopted flexible methods, allowing the researchers to capture the opinions of several university staff in a complex setting (Kember and Ginns, 2012). The research was conducted in accordance with ethical standards approved by the Australian National Statement on Ethical Conduct in Human Research (Approval number: 2019002663). This section determines the emerging technology context in Australia and outlines the survey instrument, recruitment of participants, and the data analysis procedures.

4.1. Instrument

An online survey consisting of two sections enabled systematic and relative data capture. Section 1 involved fixed response items regarding demographic information: affiliation, current appointment, levels of teaching, gender, years of teaching, previous experience in using translation technologies, areas of teaching, and technologies currently being used. Section 2 included questions developed based on previous studies concerning the Technologies Acceptance Model (TAM). These questions used standard scales (the sources used to develop survey questions). For instance, the TAM model comprised 32 items (see Table 5), which measured 'perceived usefulness' (7 items), 'perceived ease of use' (5 items), 'facilitation conditions' (5 items), 'social influences' (6 items), 'behavioural intention' (3 items), and 'attitude toward usage' (6 items). The scales for these items were either a five-point or a seven-point positively packed Linkert scale: Highest value (i.e., 7 or 5) to lowest

value (i.e., 1), denoting the range from strongly agree to strongly disagree. The questionnaires were constructed and administered using Microsoft Forms allowing the researchers to collect and export the responses from the participants into the appropriate software for data analysis.

4.2. Participants

Academic staff teaching in T&I programs at universities across Australia were invited via email through established networks. A link was attached to the email through which academics could voluntarily decide to participate in the study. Recruitment was actively conducted in the period 16 July 2019 to 22 December 2019, allowing as many academics as possible to complete the survey in a reasonable timeframe. Following the recruitment period, 22 university teachers accessed the survey, which was a lower response rate than expected. Of these, the 21 academics who completed the survey – 7 (33.33%) male and 14 (66.67%) female – were included in this study. The participants worked in universities in Queensland, New South Wales, Victoria, South Australia, and Western Australia.

4.3. Survey data analysis and results

The survey consisted of scales and open-response items to capture academic staff perceptions of their use of T&I technologies. After screening for consent and completion, scale responses were converted into numerical data and descriptive statistical analysis was performed. Inductive thematic analysis was applied to analyse the open-response items that gathered the qualitative data to provide insights for this study [item name in brackets]:

What area of technology enabled translation/interpreting do you teach and what is your involvement? [Areas of teaching]

What translation technology do you use? [Emerging translation technology]

What have been some aspects that you found difficult/challenging in adopting the translation technology? [Challenges of technology adoption]

Data screening was carried out to identify entry errors and determine whether data met assumptions for inferential statistical analysis. The preliminary descriptive analysis was conducted to examine statistics such as central tendency, variability, and normality. Correlation analysis was carried out on the data that satisfied the assumptions for parametric tests to determine the relationships between variables. SPSS was used for descriptive analysis and correlation analysis.

4.4. Demographics of the respondents

The participating academics from Australian universities were voluntarily recruited via email with a link to access the online survey. The backgrounds of the respondents are summarised in Figure 1.

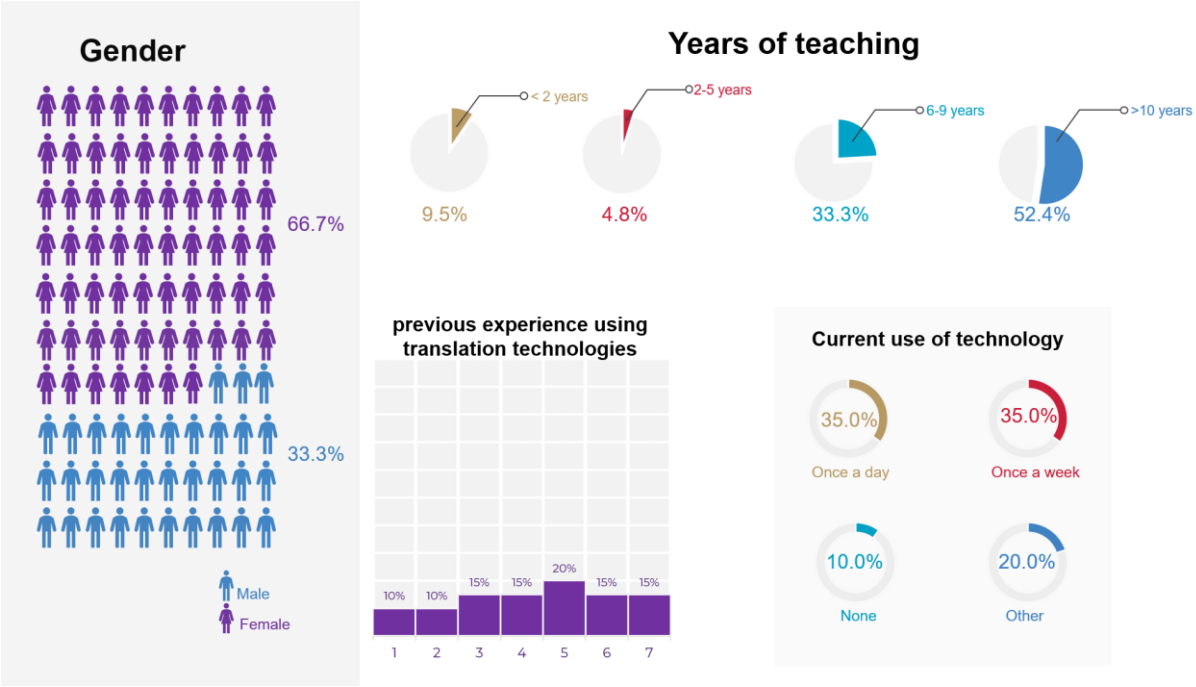

Figure 1. Summary of demographics of the respondents

While 11 of the academics in the study (52.38%) taught master's degree courses, 1 (4.76%) and 5 (23.81%) taught diploma and undergraduate courses respectively. Additionally, four participants (19.05%) taught both undergraduate and postgraduate courses. Most of the participants were considered experienced teachers: one-third had been teaching for 6-9 years and around half for more than 10 years. As noted in Figure 1, the participants' self-rated level of experience in using translation technologies (from no experience to the highest level of experience) was fairly evenly distributed, ranging from 1-7. In addition, 70% of the participants stated that they used the technology either once a day or once a week, while only 10% did not use any technology at all.

Figure 2 summarises the participants' teaching experience against their experience of using translation technologies, broken down by gender and current use of technologies (e.g., once a day, once a week, and so on). Figure 2 suggests that there was no correlation between gender and a participant's previous experience using technologies. In addition, as most participants were veteran teachers, it cannot be generalised that their years of teaching would have a positive correlation with their experience in using translation technologies. However, the participants who identified as experienced users (e.g., levels 6-7) tended to use translation technologies more often (e.g., once a day or once a week) than those who rated themselves as level 1 or 2 in terms of experience. Interestingly, the level of previous experience using technologies in the greater than 10 years category spanned the full range of technology experience from 1-7 and current use of technologies from none to once a day. Two of the three teachers, 1 male, and 1 female, who gave their levels of experience as 1 or 2 did not use any translation technologies at all. In comparison, two academics (1 male and 1 female) who identified as experienced users (levels 6 and 7) used technologies every day, as can be seen in Figure 2. One male teacher with more than 10 years teaching experience did not rate his previous experience or current use of translation technologies.

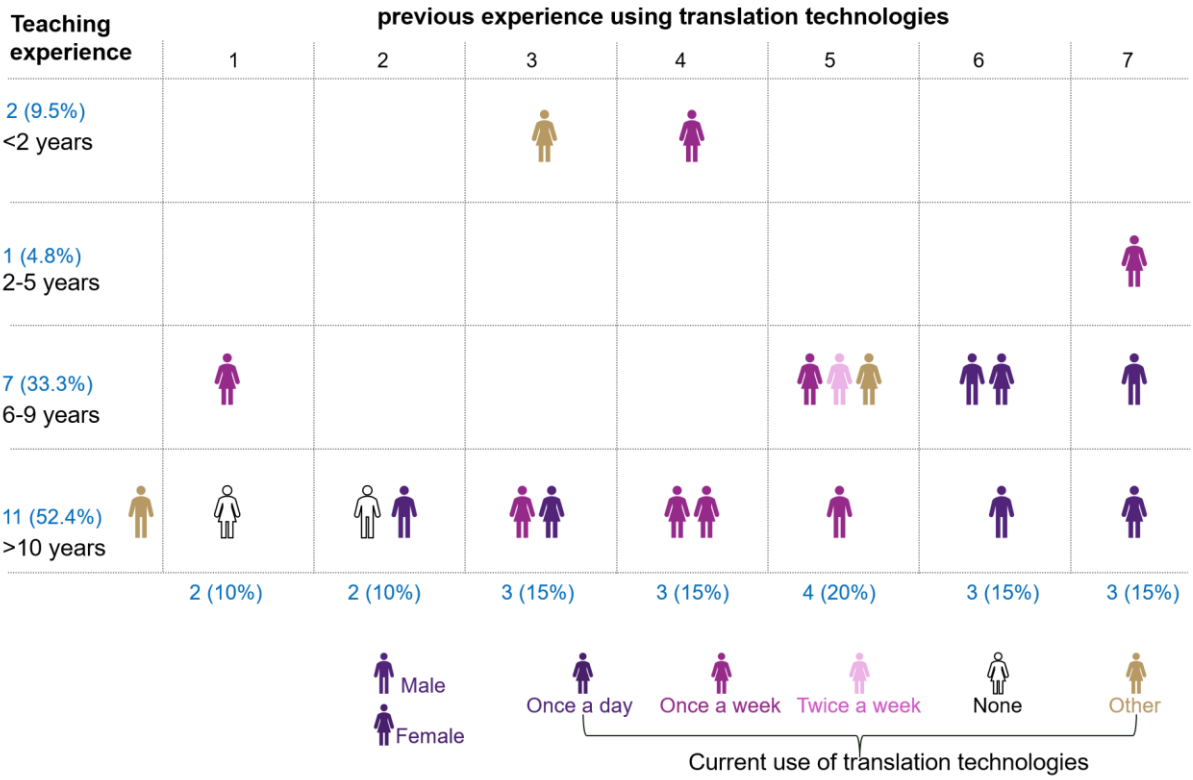

Figure 2: Participants' teaching experience against their experience using translation technologies, and by gender

In summary, most participants had been teaching in higher education for more than 6 years and used translation technologies either once a day or once a week. The experience in using technologies of the participating teachers was evenly distributed across the 7 levels.

5. Results: Areas of teaching and emerging translation technologies

This section presents information on participants' responses to two open-ended question items: areas of teaching and emerging technologies. When asked to rate their use of translation technologies on a 7-point scale (1= no experience and 7 = highest level of experience), 50% and 35% indicated that they had high (5-7) levels and low (3-5) levels respectively of experience with translation/interpreting technology. A further 20% rated themselves as having average experience. Overall, the average score for experience using technology was around the midpoint (M =4.3, SD= 1.92). The participants identified a wide range of fields of teaching in response to questions on the area of technology-enabled translation/interpreting in which they are involved. Despite the considerable diversity in their responses, three themes were identified: teaching technology enabled translation/interpreting courses, teaching translation/interpreting courses using technologies, and teaching translation/interpreting but not using technologies.[1] The translation-related technologies mentioned included Google Translate, SDL Trados, SDL Multiterm, and Memsource, as well as subtitling software such as WinCAPS and Aegisub.

Two participants mentioned that they taught undergraduate Chinese to English translation courses. The technologies identified included Google, Youdao online translation, MT, web dictionaries, web

[1] The tools listed may include some used for research purposes and/or professional practice, rather than specifically for teaching purposes.

thesauruses, web rhyme tools, web grammar sites, and bilingual internet news sites. One respondent specified using an online translation tool to teach undergraduate and postgraduate 'online translation tool' courses. Another participant teaching a master's course in the area of "TMs, MT, post-editing, subtitling" used Trados, WFA, MateCat, and a range of free TM suites in their class. Four participants mentioned that they taught Computer Assisted Translation (CAT) at a range of educational levels – that is, in BA, Diploma, Honours, and MA courses. The tools identified included CAT tools, Google, and MT, while one participant mentioned using "little beyond online dictionaries and translation software." Another respondent taught Corpus-based Translation, and Localisation using Corpus-based tools (AntConc, AntPConc, VoyantTools).

The interpreting technologies listed are mostly systems and applications to support interpreting delivery and teaching, such as Genesis language lab software and Televic Conference System, which includes AVIDAnet, Sonus, and Interpreter Q Media Player. Televic is used in tandem with Zoom to support online teaching, and WhatsApp groups/voice recording apps were also mentioned as a supporting tool. One participant mentioned teaching the use of digital pens for interpreters and bidule interpreting.

Another participant identified using the online, collaborative translation platform and also mentioned being involved in developing an online technology-enabled translation/interpreting platform. They also used this platform for teaching purposes. In relation to sign language interpreting, ELAN annotation software, GoReact capture, and feedback platform were mentioned.

In contrast, two self-identified low-level translation technology users (Levels 1 and 2) noted that they did not teach technology enabled translation/interpreting (TET) or use translation technology. The Level 1 user also stated that they did not teach translation but only used the language/conference interpreting labs and Zoom. One other participant (Level 2) suggested that they would be better able to answer the open-ended questions if the researchers specifically defined some key terms, such as T&I technologies. Further, one self-identified Level 5 user stated that they did not teach machine translation but specified that they used MemoQ. Similarly, one Level 6 user noted that they used SDL Trados but did not use the technology in their teaching.

In addition to the above-mentioned technologies, the other tools listed by participants included Baidu, for teaching, Collaborate Ultra (Online Lecture Tool), for delivering tutorials, and Microsoft Office 365 Online (PowerPoint, Word and Excel, One Drive), for student communication, sharing, and discussion.

Finally, the participants were asked to identify whether they adopted the technologies automatically (naturally, without thinking) or consciously (a conscious decision), on a 7-point scale (1 denoting very consciously to 7 denoting completely automatically). Around 10% and 29% rated themselves 3 and 4 respectively (i.e., using it consciously) whereas 24%, 19% and 19% rated their behaviours 5,6, and 7 respectively, suggesting unconscious (automatic) thought processes. The average score for habit was 5.1 (SD = 1.30), signifying that most participants used technology somewhat instinctively. On a 7-point scale (1= does not outweigh and 7 = completely outweighs), 9% rated themselves either 2 or 3 whereas 48% rated themselves as 4. Additionally, 9%, 14%, and 19% rated themselves 5, 6 and 7 respectively on this scale. The average score for intention to use technologies in the future was 4.81 (SD= 1.44), indicating that their opinions of the benefits of the technologies slightly outweighed the monetary cost to the university (< assuming academics are not paying) and/or their students of using them in the future.

5.1. Technology acceptance of T&I academics

Figure 3 summarises the participants' opinions (%) about how technologies might benefit their teaching and learning activities.

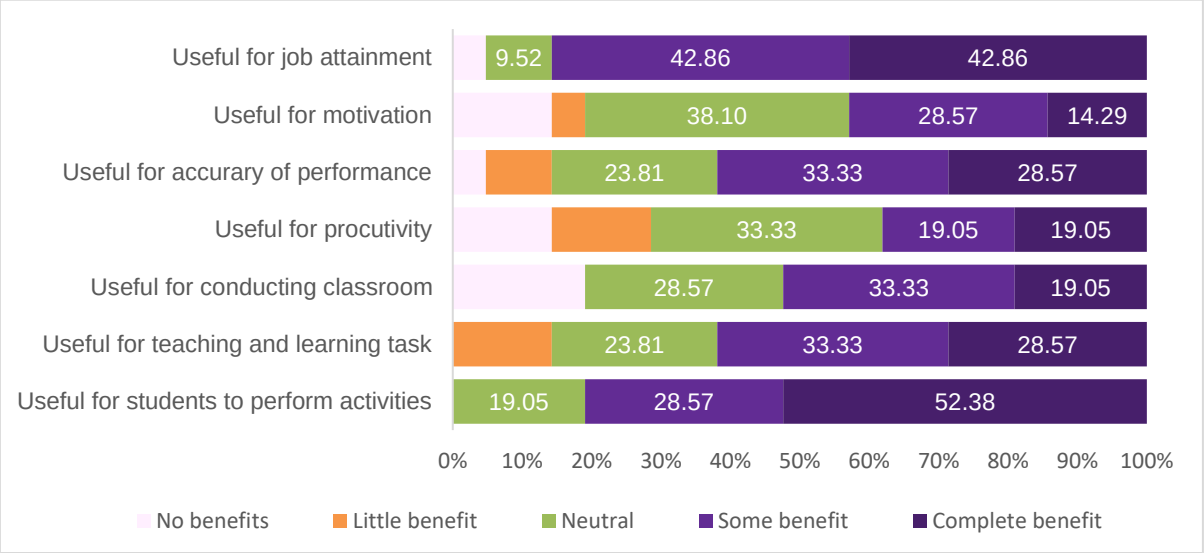

Figure 3: Participants' opinions in response to perceived usefulness questions

The data analysis aimed to examine the relationships between 6 variables on using translation technologies following the technology acceptance model (TAM). These variables involve perceived usefulness, perceived ease of use, facilitation conditions, social influences, behavioural intention, and attitude towards usage. The descriptive statistics of these variables are presented in Table 1. All average scores are above the midpoint of 2.5 (on a 5-point scale) and 3.5 (on a 7-point scale) whereas the standard deviations fall within the range of 0.98-1.65, suggesting minimal dispersion of data around the mean. Here, perceived usefulness, habit, behavioural intention, and motivation are moderately significantly correlated with the intention to use technologies. In comparison, social factors and trust did not have a significant influence on the participants' intention to use translation technologies.

Table 1: Descriptive statistics concerning different variables

Variables	Number of questions	*M*	*SD*	Correlation with intention to use
Perceived usefulness (PU)	7	3.67	1.19	.43*
Perceived ease of use (PEU)	5	3.06	1.01	.37*
Facilitation conditions (FC)	5	3.55	0.98	.31*
Social influences (SI)	6	2.83	1.16	.22
Behavioural intention (BI)	3	4.05	1.06	.50*
Attitude toward usage (ATU)	6	3.21	1.10	.31

* Statistically significant at *a*.= 05

The items that met the parametric tests were analysed to examine their correlation using the Pearson r correlation method. It was found that 54, 31 and 40 pairs of items were statistically

significantly correlated at .05, .01 and .001. It should be noted that although almost all strong relationships occurred in items categorized in the same construct (i.e., perceived usefulness, perceived ease of use, facilitation conditions, and so on), the researchers chose most items from different constructs to facilitate further constructive discussion. For example, items in the same construct such as the construct Perceived Ease of Use (PEU) are commonly highly correlated with one another: Easy to use – Easy to be skilful ($r = .88$, $p < .001$), Easy to use – Easy to apply in practice ($r = .89$, $p < .001$), Useful for carrying out teaching and learning tasks – Allow conduct activities more quickly ($r = .84$, $p < .001$), and Allow conduct activities more quickly – Improve teaching productivity ($r = .90$, $p < .001$), Individual in environment – thoughts of using ($r = .91$, $p < .001$), Individual in environment – High profile user ($r = .85$, $p < .001$). The correlation matrix of selected pairs (out of 53 pairs) from different constructs that had a strong relationship (r values > .60) according to Plonsky and Oswald (2014) is presented in Table 2.

Table 2: Correlation matrix of TAM items

Variables	*r*	*p*
Improve accuracy of performance – Intention to recommend to friends and family	.80	< .001
Useful for job attainment – Intention to use in the future	.75	< .001
Easy to use – Students' perception of enough resources	.73	< .001
Effortless regarding student use of it – Students' perception of enough resources	.73	< .001
Improve productivity in teaching methods – Worry-free for students	.73	< .001
Improve productivity in teaching methods – Effortless regarding student's use of it	.72	< .001
Allow conduct activities more quickly – Worry-free for students	.70	< .001
Useful for job attainment – Intention to recommend to friends and family	.70	< .001
Easy to be skilful – Students' perception of enough resources	.69	< .001
Motivate and provide reward and recognition – Intention to recommend to friends and family	.69	< .001
Improve accuracy of performance – Intention to use technology in the future	.68	< .001
Intention to recommend to friends and family – Perceptions of benefits outweighs the cost	.66	.001
Improve accuracy of performance – Perceptions of benefits outweigh the cost	.63	.002
Useful for carrying out teaching and learning tasks – Intention to recommend to friends	.63	.002
Easy to apply – Students' perception of enough resources	.62	.003
Trust the technology in term of its longevity – Perceptions of benefits outweighs the cost	.62	.003
Useful for carrying out teaching and learning tasks – Worry-free for students	.62	.003
Have the knowledge needed to use – Perceptions of benefits outweigh the cost	.61	.003
Resource available – Receive enjoyment in using technologies	.61	.004
Worry-free for students – Trust technology tools in terms of their longevity	.60	.004

As Table 2 shows, these pairs have a significant positive correlation with a large effect size. That is to say, their relationships are statistically meaningful. For example, the correlation between the participants' perceptions of 'T&I technologies improve the accuracy of performance' (PU) and their 'intention to recommend the technology tools to friends and family is high ($r = .80$, $p < .001$).

The descriptive statistics suggest that the participants had moderately to highly positive opinions regarding T&I technologies in terms of their usefulness, ease of use, facilitation conditions, social influences, behavioural intention, and attitude toward usage. The participating academics also tended to adopt translation and interpretation technologies somewhat automatically ($M = 5.10$, $SD = 1.30$). However, social factors did not appear to greatly influence the participants' use of these technologies. For example, participants average scores on the influence of high-profile users or family and friends on their use of technologies were 2.71 ($SD = 1.10$) and 2.43 ($SD = 1.03$) out of 5. As Table 4 shows (in Appendix), 42.86% and 52.38% of the participants believed that the technologies had a significant benefit in their current and future work and for their students in performing tasks, respectively.

5.2. Challenges of the adoption of technologies

In response to the final question, "What have been some aspects that you found difficult/challenging in adopting the translation technology?", the participants identified several challenges they faced. While four respondents thought that the prices of technologies were very high, two others expressed the view that it was not easy to use technologies. Some participants also stated that mastering the technologies required considerable time and effort. On the other hand, another participant observed that even though mastering translation technology may involve a steep learning curve at first, once a user is accustomed to using the technology, it gets easier to become proficient in using new tools.

The constraints of the software and hardware were another factor raised by the participants, who mentioned malware issues, quickly becoming outdated, translation accuracy, internet connections, software design, low-quality terminology management, and integration issues with ML/AI. Lack of resources, such as training in how to use the software, was another challenge, while one participant also mentioned that IT support staff were sometimes unable to solve issues with the technology that arose during classes. Other participants indicated that they did not have any issues with the use of technologies in class.

The challenging/difficult aspects of adopting translation technologies are summarised in Table 3.

Table 3: Challenges and difficulties of adopting translation technology

Challenges	Tally related to theme	Example of open responses
Software issues including reliability and accuracy	8	· Malware in the software · The technology becomes out of date too quickly and is too expensive to upgrade · Software design · Terminology management is not good/intelligent enough.

		· Little integration with ML (machine learning) and/or AI (artificial intelligence) · It does not translate accurately · Proofreading can be very time-consuming · Not always reliable and accurate
High cost	4	· Price too high
Issues relating to class activities	3	· When the technology doesn't work, but the tech people can't work out why and class time is lost. Also, that a problem with the lab in one class suddenly disappears and another one arises (not consistent so hard to follow up). Uni tech people don't know how we use the technology, so we have to explain it or ask for what we need. · Students who are Luddites struggle and can waste class time. · In the current environment (teaching online) internet problems can cause issues.
Learning curve	3	· Learning required to master the technology · Unaware of tools existence -- I often just stumble across them · Translation technology may have a steep learning curve at the beginning, however, once you are accustomed to using technology, it gets easier to get proficient with new tools.
Resource problems	3	· The tech people can't work out why… Uni tech people don't know how we use the technology, so we have to explain it or ask for what we need. · Lack of people to teach us how to use the available resources · I teach a range of younger to older students, with different resources, so not all students have the aptitude, confidence, or quality of equipment (computers) to make the most use of technology without extra assistance or expenditure
Difficulty of use	2	· Not easy to use

6. Discussion

This study has aimed to understand how academics in Australian universities viewed and adopted T&I technologies. The proposed model was determined by empirical research, including teaching staff at selected universities across Australia.

6.1. RQ1: What are the current applications of technologies in T&I courses in Australia?

The descriptive analysis suggests participants' self-identified level of experience in using technologies was diverse. At the same time, all were experienced teachers, who may reflect the fact that most course coordinators at Australian universities have generally been teaching for many years. Additionally, some participants taught only translation or interpreting, while others taught both fields. Around 70% of the participating academics used T&I technologies fairly regularly (either once a day or once a week), while only 10% did not use such technologies at all. As many of the participants are female and have substantial teaching experience, it would not be reasonable to draw

any general conclusions about the academic use of technology based on gender or years of teaching. However, the participants who identified themselves as high-level users tended to use technologies more frequently and rated them more highly on the questions concerning usefulness, ease of use, and attitude towards usage of technologies.

Some participants provided information on the specific tools they used, while others mentioned general names (e.g., CAT tools, online dictionaries). On the other hand, some respondents said they did not teach a translation course (they only taught interpreting), so the question was irrelevant to them. For those who used technology, the types of technologies they used are depended on the specific courses and on the participants' roles and foci. For example, if they focused on students' participation and collaboration, they used an online translation platform with the view to facilitate student collaboration and feedback. One participant who focused on sign language interpreting used video capture and analysis as the core technology, whereby they mainly used NB Interpreting, including ELAN annotation software, GoReact capture and feedback platform rather than translation.

Lecturers who teach interpreting seem to utilize technologies and tools that support the delivery and teaching of interpreting (e.g., Televic Conference system and Lang Lab software). On the other hand, those who teach translation listed a wide range of tools that facilitate the translation process. However, online dictionaries are widely used in both fields. In summary, the technologies used in translation are often different from those used in interpreting, even though there is some overlap. Participants identified a range of tools used in translation, including Google Translate, Youdao Online Translate, Baidu, WFA, MateCat, and other online translation tools and platforms. Corpus tools (AntConc, AntPConc, VoyantTools), SDL Trados, SDL Multiterm, Memsource, MemoQ, WinnCAPS, and Aegisub were also mentioned. A variety of interpreting tools were also mentioned, including the Televic Conference system, Lang Lab software, and NB interpreting. Due to COVID-19 restrictions, several tools that facilitated online interactions, such as Zoom, WhatsApp, and other unspecified online platforms, were also used. Collaborate Ultra and internet search was also mentioned.

In summary, whether or not the participants used technology did not seem to be solely dependent on their self-identified level of experience. Most used the technologies automatically, whereas a few made a conscious decision to use them. However, staff with a low level of experience with technology did not seem to use the technologies and gave low ratings in response to most questions across various constructs: perceived usefulness, ease of use, and attitudes toward usage.

6.2. RQ2: What are the academics' perceptions of adopting technologies in their courses?

The participating academics tended to have a high level of appreciation of the technologies, in terms of their usefulness, facilitation conditions and behaviour intentions. This resonates with Teo's study (2011) which found a good model of fit for these facilitating conditions, except for subjective norms. More than 80% of participants thought technologies had "some" to "complete" benefits for their job performance and for students in performing tasks. Similarly, more than 60% believed technologies were "somewhat" to "completely" useful for accuracy in performance and teaching and learning. Participants' high regard for technologies in terms of their usefulness for teaching, learning, and performance reflects the findings of other practical studies such as Maican et al. (2019), Oye et al. (2014), and Rienties et al. (2016).

Additionally, participants valued T&I technologies moderately, in terms of ease of use and attitudes towards usage such as trust and hedonistic motivation. This is consistent with the findings

of Park et al. (2007) that motivation played a significant role in university academics' intention to use technologies. By comparison, social factors did not have a strong influence on their use of technologies. In particular, the participants rated the influence of friends and family below the midpoint (M= 2.43, SD = 1.03), in comparison to the influences of other individuals in their environment (M= 3.5, SD = 1.24). These findings are similar to those of Ndubisi (2006), who found that subjective norms and social influences did not effect on students' intention to use technology.

The correlation analysis revealed that 125 pairs of items had statistically significant positive relationships. However, most of these relationships were between items belonging to the same construct (e.g., PEU, PU, ATU). For example, the participants who believed that T&I technologies enabled them to conduct classroom activities more quickly tended to also believe that such technologies allowed them to be more productive in their teaching methods ($r = .90$, $p < .001$). In comparison, those who thought that individuals in their environment who used such translation/interpreting technologies had more prestige and influence than those who didn't, tended to also believe that those around them thought they should use such technologies ($r = .91$, $p < .001$). This was also found consistently in the systematic literature review by Liu et al. (2020).

As Table 2 shows, those academics who tended to recommend technology tools to their friends and family thought that technologies improved the accuracy of their performance ($r = .80$, $p < .001$); were useful for job attainment ($r = .70$, $p < .001$); motivated and provided reward and recognition ($r = .69$, $p < .001$); and were useful for carrying out teaching and learning tasks ($r = .63$, $p < .001$). This finding resonates with the celebrated studies by Deci & Ryan (1985), which observed the importance of extrinsic rewards on individuals' behaviours during learning. In addition, the participants who stated that they would use technologies in the future appeared to be those who believed that technology tools were useful for their work performance ($r = .75$, $p < .001$) and improved their accuracy of performance ($r = .68$, $p < .001$). This finding is similar to Cerasoli et al. (2014, p. 980), whose paper entitled "Intrinsic motivation and extrinsic incentives jointly predict performance: a 40-year meta-analysis" outlines the link between these variables. In addition, the participants who believed that the benefits of technologies outweighed their cost tended to believe that these technologies improved the accuracy of their performance ($r = .63$, $p = .002$), trust the longevity of the technology ($r = .62$, $p = .003$) and have the required knowledge ($r = .61$, $p = .003$). This finding echoes Hu et al.'s (2019) study, which found that users' trust had a compelling influence on their attitudes to technology adoption.

The challenges identified by the participants were classified into five themes: software issues, cost, learning curve, class activity issues, scarcity of resources, and difficulty of use. The software problems included malware, software design, the reliability and accuracy of the software. The participants also mentioned that technologies become outdated quickly and are costly to keep up to date. While these views are somewhat similar to those expressed in Jafari & Soltani's (2016) study on the effect of cost on technology acceptance in the case of e-customer management systems, it is questionable whether costs are the greatest barrier to adoption in the higher education context. Additionally, issues with technologies can disrupt class activities. One mentioned that when they experienced problems with the technologies and called for help from IT support staff, they were unable to resolve the issues because they did not have specific knowledge of the particular software. This issue also reflects a concern raised by other participants, who mentioned the lack of technical support to teach them about the technologies. This suggests that using T&I technologies requires knowledge and skills specific to those technologies. Prior knowledge of other technologies might not be transferrable to many T&I tools. This point echoes Alenezi, Karim, & Veloo's (2011) finding that technical support was an underpinning variable affecting user adoption of e-library services.

Although participants appeared to appreciate, for example, the usefulness of the technologies, they tended not to be highly motivated to use them in the future, especially when the cost was factored into the equation (M= 4.81 out of 7, SD=1.44), in addition to the challenges discussed above. This differs from previous research in this space, in particular Liu, Geertshuis and Grainger's (2020) recent systematic literature review of 131 papers on academics' adoption of learning technologies, which found that none of these studies mentioned cost.

7. Conclusion

This study set out first to gather publicly available data on T&I technology courses in Australian universities, and then to selectively sample universities to obtain further information through an online survey, with two-clear objectives. The first pertained to the current applications of these tools, to understand the various tools being used in the academy; and the second was to better understand how academics perceive these technologies. In short, this research found that academics' perceptions and use of technologies in the field were consistent with previous findings regarding ease of use and usefulness.

The implications for pedagogical practice focus on two groups of university teacher practitioners: those concerned with translation and those involved with interpreting. This section first discusses which technologies are currently available and their application in the classrooms, and then goes on to elaborate on the implications for administrators and policymakers. It concerns T&I academics and the perceptions and proficiency of educators in T&I technologies in terms of:

1. Emerging technologies that can be used in teaching T&I
2. The challenges of technology adoption and ways to address them

In recent years, the use of technologies in supporting education has been the focus of several studies. This has led to recommendations for how educators can make the most of the available technologies to facilitate student learning. For instance, the 2020 Horizon Report observes that a leading future technological trend is likely to be the use of artificial intelligence for applications for refining language translations (Brown et al., 2020). However, little is known about how academics perceive technological tools and how these can specifically enhance their teaching and learning. Our study suggests that the adoption of technology depends to some extent on how technologically savvy, or habituated to its use, the instructors are, while usability and lack of user-friendliness remain key issues in determining how people use and adopt educational technologies.

While this study did not pay attention to this, a broader question for future studies concerns the ethics of translation technology and for whom, where, why, and in whose interests, it is being funded (Koskinen & Pokorn 2020, p.262). This study has shown that there is potential in surveying emerging T&I technologies and analysing educators' perceptions about adopting such technologies following the TAM model. First, it will be interesting to discover the extent to which the results of this study apply in other settings, such as those with different participants, different countries, different disciplines, as well as different cultures. Additionally, this study only focused on educators' perceptions; future studies may include other stakeholders, including students and professional staff (Alotaibi, 2014; Halim, 2019; Man et al., 2020; Odacıoglu, & Kokturk 2015). Conducting research with large sample sizes (e.g., 200 - 300 participants) tends to provide more constructive insights into

emerging technologies and the TAM model. This would also include developing a model to explain and predict participants' perceptions regarding the TAM model.

In addition, the study of emerging technologies and perceptions about using technologies in T&I is relatively new in Australian education. As a result, there is a need for a range of studies on emerging technologies, stakeholders' perceptions and perhaps their real-life practices to provide insights into how T&I education in Australian higher education can be improved to benefit all students, regardless of their backgrounds and challenges. Indeed, the findings of this study are fruitful and serve as a preliminary basis for future research.

7.1. Limitations

This study has several limitations. Firstly, the sample size is relatively small, as there are only a small number of academics who teach technology enabled T&I. Secondly, our study only focused on the use of technologies in T&I teaching in Australian universities. Thirdly, the study involved investigating the perceptions of participants who have unique characteristics, working in a particular institute with a specific culture. The courses taught by the participating academics were also exceptionally diverse. Hence, caution must be exercised when generalizing the findings of this study to other groups. There are a number of ways the survey used in this study could be improved for future use. For example, to enable more reliable analysis, each item should be rated according to the same scale, such as 1-5 or 1-7, and each construct should have a similar number of items. Furthermore, some participants suggested that a glossary of key terms should be provided, while others suggested that a distinction between T&I should be made when considering the design of future studies.

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Appendix

Table 4 Descriptive statistics of the constructs

items	**1**	**2**	**3**	**4**	**5**	**6**	***7***	***M***	***SD***
Perceived usefulness	***No benefit***				***® Complete benefit***	-	-	**3.67**	**1.19**
1. Benefits students in performing activities	0.00	0.00	19.05	28.57	52.38	-	-	4.33	0.80
2. Is useful to carry out my teaching and learning tasks	0.00	14.29	23.81	33.33	28.57	-	-	3.76	1.04

3. Allows me to conduct classroom practices more quickly	19.05	0.00	28.57	33.33	19.05	-	-	3.33	1.35
4. Improves my productivity in my teaching methods	14.29	14.29	33.33	19.05	19.05	-	-	3.14	1.31
5. Improves the accuracy of performance	4.76	9.52	23.81	33.33	28.57	-	-	3.71	1.15
6. Motivates me and provides reward and recognition	14.29	4.76	38.10	28.57	14.29	-	-	3.24	1.22
7. Is useful in current and future job attainment	4.76	0.00	9.52	42.86	42.86	-	-	4.19	0.98
Perceived ease of use	***Comp disagree ® Completely agree***					-	-	**3.06**	**1.01**
1. Easy to use	0.00	19.05	47.62	23.81	9.52	-	-	3.24	0.89
2. Easy to become skilful in	0.00	23.81	38.10	28.57	9.52	-	-	3.24	0.94
3. Easy to apply in practice	0.00	14.29	33.33	42.86	9.52	-	-	3.48	0.87
4. Are worry-free and understandable for students	14.29	19.05	42.86	19.05	4.76	-	-	2.81	1.08
5. Effortless regarding student use of it	19.05	23.81	47.62	4.76	4.76	-	-	2.52	1.03
Facilitation conditions	***Strongly disagree ® Strongly agree***					-	-	**3.55**	**0.98**
1. Have the resources available to me to use translation/interpreting technologies	0.00	4.76	33.33	42.86	19.05	-	-	3.76	0.83
2. Get help from others when I have difficulties using the technologies	4.76	9.52	47.62	23.81	14.29	-	-	3.33	1.02
3. Have the knowledge needed to use translation/interpreting technologies effectively	0.00	14.29	23.81	23.81	38.10	-	-	3.86	1.11
4. Use translation/ interpreting technologies that are compatible with other technologies you use	0.00	9.52	38.10	33.33	19.05	-	-	3.62	0.92
5. Students perceive that there are enough resources and support available to perform the translation/ interpreting technology	0.00	23.81	42.86	23.81	9.52	-	-	3.19	0.93
Social influences	***Strongly disagree ® Strongly agree***					-	-	**2.83**	**1.16**
1. Individuals who influence my behaviour think I should use	9.52	14.29	57.14	9.52	9.52	-	-	2.95	1.02

translation/ interpreting technology									
2. (Social Factors) Influences around me think (I? they?) should use translation/ interpreting technology	14.29	14.29	38.10	19.05	14.29	-	-	3.05	1.24
3. (Image) Individuals in my environment who use translation/ interpreting technology have more prestige and influence than those who don't	14.29	14.29	38.10	19.05	14.29	-	-	3.05	1.24
4. People in my environment who use translation/interpreting technology have a high academic profile	14.29	28.57	33.33	19.05	4.76	-	-	2.71	1.10
5. Having skills in translation/interpreting technology increases status at my institution	23.81	14.29	33.33	19.05	9.52	-	-	2.76	1.30
6. Family and friends believe that I should adopt a particular technology	23.81	23.81	38.10	14.29	0.00	-	-	2.43	1.03
Behavioural intention	***Very unlikely***		***® Very likely***			-	-	**4.05**	**1.06**
1. Using technology tools in the future	0.00	4.76	14.29	19.05	61.90	-	-	4.38	0.92
2. Your intentions to recommend to friends and family	4.76	9.52	19.05	42.86	23.81	-	-	3.71	1.10
3. What are your cognitive perceptions in terms of whether the perceived benefits of the technology outweigh the monetary cost of yourself and/or your students using them in the future	***Do not outweigh***			***Completely outweigh***				**4.81**	**1.44**
	0.00	4.76	4.76	47.62	9.52	14.29	19.05	4.81	1.44
Attitude towards usage									
Trust:	***Not at all***		***®***		***A lot***	-	-	3.21	1.10
1. Trust the technology you are using in respect to its longevity	9.52	14.29	19.05	42.86	14.29	-	-	3.38	1.20
2. Have ethical concerns regarding the technology	14.29	14.29	33.33	33.33	4.76	-	-	3.00	1.14
3. Have any security or privacy concerns regarding the technology	4.76	33.33	19.05	33.33	9.52	-	-	3.10	1.14

4. That they are reliable	0.00	19.05	33.33	38.10	9.52	-	-	3.38	0.92
5. *Hedonistic motivation*: Do you receive any enjoyment or satisfaction in using the translation or interpreting technology?	***No enjoyment***			®	***Complete enjoyment***			**4.71**	**1.65**
	9.52	0.00	4.76	23.81	33.33	14.29	14.29	4.71	1.65
6.*Habit*: Would you consider yourself someone that adopts technology automatically or through habit?	***Very critical***			®	***Automatically***			**5.10**	**1.30**
	0.00	0.00	9.52	28.57	23.81	19.05	19.05	5.10	1.30

Table 5 Codebook

No	Questions	Code
1	Which university are you affiliated with?	1 = University of Queensland 2= University of Adelaide 3 = Western Sydney University 4 = University of Western Australia 5 = UNSW 6 = RMIT university 7 = Macquarie University 8 = University of Melbourne 9 = affiliated with more than one university
2	What is your current work appointment	1= Full time/ fractional appointment (continuing) 2 = Casual/ fixed term
3	At which level do you teach translation and/or interpreting?	1 = Bachelor's/ undergraduate 2 = Master's/ postgraduate 3 = Diploma/ Graduate Certificate 4 = Teach more than one level
4	What is your gender	1 = Male 2 = Female
UB		
5	How many years have you been teaching translation/ interpreting at university?	1 = < 2 years 2 = 2-5 years 3 = 6-9 years 4 = > 10 years
6	What is your previous experience using translation technologies before?	Scale from 1-7 1= No experience 7= Highest level of experience
7	What area of technology enabled translation/interpreting do you teach and what is your involvement?	Free text entry
8	What translation technology do you use?	Free text entry
9	What is your current use of the technology?	1= Once a day 2= Once a week 3= Once a month 4 = Once per semester 5= Few times per year

		6= Once a year 7= Other 8 = None
	PE	
10	To what degree do you think using translation/interpreting technology: 1. Benefits students in performing activities 2. (Job-Fit) Is useful to carry out my teaching and learning tasks 3. (Relative Advantage) Allows me to conduct classroom practices more quickly 4. Improves my productivity in my teaching methods 5. Improves the accuracy of performance 6. Extrinsic motivation) motivates me and provides reward and recognition 7. (Received usefulness) Is useful in current and future job attainment	1= No benefit 2= Little benefit 3= Neutral 4 = Some benefit 5 = Complete benefit
	EE	
11	I think translation technology/interpreting technologies are: 1. (PEOU) Easy to use 2. Easy to become skilful in 3. Easy to apply in practice 4. Worry-free and understandable for students 5. (complexity) Effortless regarding student use of it	1 = Completely disagree 2= Disagree 3= Neutral 4 = Agree 5 = Completely agree
	Facilitation Condition	
12	In relation to conditions needed to facilitate the adoption of translation/interpreting technology, do you think you have the facilitating conditions to 1. Have the resources available to me to use translation/interpreting technologies 2. Get help from others when I have difficulties using the technologies 3. Have the knowledge needed to use translation/interpreting technologies effectively 4. (Compatibility) Use translation/ interpreting technologies that are compatible with other technologies you use 5. Students perceive that there are enough resources and support available to use the translation/ interpreting technology	1 = Strongly disagree 2= Disagree 3= Neutral 4 = Agree 5 = Strongly agree
	Social Influences	

13	Regarding Social influences, do you think 1. (Image) Individuals who influence my behaviour think I should use translation/ interpreting technology 2. (Social Factors) Influences around me think I should use translation/interpreting technology 3. (Image) Individuals in my environment who use translation/interpreting technology have more prestige and influence than those who don't 4. People in my environment who use translation/interpreting technology have a high academic profile 5. Having skills in translation/interpreting technology increases status at my institution 6. Family and friends believe that I should adopt a particular technology	1 = Strongly disagree 2= Disagree 3= Neutral 4 = Agree 5 = Strongly agree
	Habit	
14	Would you consider yourself someone that adopts technology automatically (habit) or consciously (conscious thought)?	Scale 1-7 1= Very critical 7= Automatically
	Behavioural Intention	
15	What is your behavioural intention towards 1. Using technology tools in the future 2. Your intentions to recommend to friends and family	1 = Very unlikely 2 = Somewhat unlikely 3 = Neither likely nor unlikely 4 = Somewhat likely 5 = Very likely
	Trust	
16	With respect to trust, do you 1. Trust the technology you are using with respect to its longevity 2. Have ethical concerns regarding the technology 3. Have any security or privacy concerns regarding the technology 4. Consider that it is reliable	1 = Not at all 2 = A little 3 = Neutral 4 = Somewhat 5 = A lot
	Hedonistic motivation	
17	Do you receive any enjoyment or satisfaction in using the translation or interpreting technology?	Scale 1-7 1= No enjoyment 7= Complete enjoyment
	Intention to use	
18	What are your cognitive perceptions in terms of whether the perceived benefits of the technology outweigh the monetary cost of yourself and/or your students using them in the future	Scale 1-7 1= Does not outweigh 7= Completely outweigh
19	What have been some aspects that you found difficult/challenging in adopting the translation technology	Free-text entry

Table 6 Normality test

items	*z* of skewness	*z* of kurtosis	*KS*test	Shapiro-Wilk	histogram	Q-Q plot	*M*	*SD*	normality assumption
10.1Benefits students in performing activities	-1.41	-1.03	0.00	0.00	left-skewed	no	4.33	0.80	no
10.2 (Job-Fit) Is useful to carry out my teaching and learning tasks	-0.69	-1.00	0.02	0.01	slightly left-skewed	yes	3.76	1.04	yes
10.3 (Relative Advantage) Allows me to conduct classroom practices more quickly	-1.35	-0.49	0.01	0.00	slightly left-skewed	yes	3.33	1.35	no
10.4 Improves my productivity in my teaching methods	-0.29	-0.86	0.11	0.06	ok	yes	3.14	1.31	yes
10.5 Improves the accuracy of performance	-1.39	-0.02	0.01	0.02	left-skewed	yes	3.71	1.15	no
10.6 Extrinsic motivation) motivates me and provides reward and recognition	-1	-0.21	0.00	0.02	ok	yes	3.24	1.22	yes
10.7 (Received usefulness) Is useful in current and future job attainment	-3.64	4.77	0.00	0.00	left-skewed	no	4.19	0.98	no
11.1 (PEOU) Easy to use	0.85	-0.23	0.00	0.01	ok	yes	3.24	0.89	yes
11.2 Easy to become skillful in	0.52	-0.71	0.01	0.02	ok	yes	3.24	0.94	yes
11.3 Easy to apply in practice	-0.34	-0.49	0.00	0.01	ok	yes	3.48	0.87	yes
11.4 Is worry-free and understandable for students	-0.23	-0.27	0.00	0.06	ok	yes	2.81	1.08	yes
11.5 (complexity) Effortless regarding student use of it	0.46	0.38	0.00	0.01	slightly right-skewed	yes	2.52	1.03	no
12.1 Have the resources available to me to use translation/interpreting technologies	-0.16	-0.49	0.00	0.01	ok	yes	3.76	0.83	yes
12.2 Get help from others when I have difficulties using the technologies	-0.26	0.31	0.00	0.03	slightly left-skewed	yes	3.33	1.02	yes

12.3 Have the knowledge needed to use translation/interpreting technologies effectively	-0.84	-1.21	0.01	0.00	left-skewed	no	3.86	1.11	no
12.4 (Compatibility) Use translation/ interpreting technologies that are compatible with other technologies you use	0.08	-0.75	0.01	0.02	ok	yes	3.62	0.92	yes
12.5 Students perceive that there are enough resources and support available to perform the translation/ interpreting technology	0.83	-0.46	0.00	0.01	ok	yes	3.19	0.93	yes
13.1 (Image) Individuals who influence my behaviour think I should use translation/ interpreting technology	0.21	0.77	0.00	0.01	ok	yes	2.95	1.02	yes
13.2 (Social Factors) Influences around me think (I? they?) should use translation/ interpreting technology	-0.2	-0.61	0.03	0.07	ok	yes	3.05	1.24	yes
13.3 (Image) Individuals in my environment who use translation/ interpreting technology have more prestige and influence than those who don't	-0.2	-0.61	0.03	0.07	ok	yes	3.05	1.24	yes
13.4 People in my environment who use translation/interpreting technology have a high academic profile	0.27	-0.51	0.10	0.10	ok	yes	2.71	1.10	yes

13.5 Having skills in translation/interpreting technology increases status at my institution	0.07	-0.96	0.04	0.04	ok	yes	2.76	1.30	yes
13.6 Family and friends believe that I should adopt a particular technology	-0.19	-1.11	0.00	0.01	slightly right-skewed	yes	2.43	1.03	yes
14. Would you consider yourself someone that adopts technology automatically or through habit?	0.22	-1.12	0.07	0.05	ok	yes	5.10	1.30	yes
15.1 Using technology tools in the future	-2.62	0.75	0.00	0.00	left-skewed	no	4.38	0.92	no
15.2 Your intentions to recommend to friends and family	-1.71	0.46	0.00	0.01	slightly left-skewed	no	3.71	1.10	no
16.1 Trust the technology you are using in with respect to its longevity	-1.28	-0.39	0.00	0.02	slightly left-skewed	yes	3.38	1.20	yes
16.2 Have ethical concerns regarding the technology	-0.89	-0.57	0.01	0.03	ok	yes	3.00	1.14	yes
16.3 Have any security or privacy concerns regarding the technology	0.05	-1.09	0.01	0.03	ok	yes	3.10	1.14	yes
16.4 Consider that they are reliable	-0.08	-0.75	0.01	0.02	slightly right-skewed	yes	3.38	0.92	yes
17. Do you receive any enjoyment or satisfaction in using the translation or interpreting technology?	-1.65	0.92	0.05	0.03	slightly left-skewed	yes	4.71	1.65	yes
18. What are your cognitive perceptions in terms of the perceived benefits of the technology outweigh the monetary cost of yourself and/or	0.51	-0.74	0.00	0.01	ok	yes	4.81	1.44	yes

your students using them in the future

Description of technology courses

UNSW	MODL5107 Translation	In this course, you will develop the necessary skills to work effectively with cutting-edge translation technologies, including computer-assisted translation tools and machine translation. You will learn how to use contemporary translation technologies in complex professional projects to meet client needs. You will acquire the necessary contextual knowledge and skills to critically employ translation technologies to a range of real-world individual and group-based scenarios in the language services industry. You will also develop problem-solving and intercultural communication skills in the context of authentic translation project management.
	MODL5103 Multimedia Translation	This course provides you with both theoretical knowledge and practical experience in multimedia translation at a professional level. This includes: 1. online texts (business, politics, culture, and social affairs). 2. audio-visual translation (captioning and subtitling). 3. multimedia content (video game localisation and software localisation). The course frames multimedia translation within an international perspective with emphasis on the cutting-edge technologies embedded in the language services industry of today.
The University of Melbourne	TRAN90011 Translation Studies Workshop	In this subject student will be introduced to the major theoretical and methodological approaches for analysing and evaluating translations. Through seminars, class discussions and readings, students will gain insight into the central issues in translation studies. The focus is on building the knowledge and analytical skills required for conducting a research project in translation studies. On completion of this subject students should : • have a sound understanding of the methods and aims of translation research • have a comprehensive understanding of the theories underpinning the practice of translation • have a critical understanding of the cultural and intellectual foundations of the cultural embedding of translation tasks • have a sound understanding of the range of technologies used in translation • have advanced skills in negotiating the cultural and intellectual boundaries of the cultures involved.

Monash University	APG5876 Translation trends in a digital age	The aim of the unit is to familiarize its participants with the challenges a translator faces when translating multimodal discourse. The unit examines the ways in which textual multimodality affects the translator's work and discusses the impacts of image, word, and sound in different contexts of translation. The unit covers various types of multimodal translation, such as audio-visual translation, audio description, and the translation of different types of illustrated texts. The unit provides students with practical experience of Computer Assisted Translation (CAT) tools and other computational resources (such as corpora and terminology tools). The focus on the international and technological framework for translation in a digital age will provide essential introductory knowledge about the localization industry and help students develop expertise in multimodal translation and the associated requirements, sensitivities, and opportunities. Some of the seminars may be taught by guest lecturers. Upon successful completion of this unit, students will be able to: 1. know and understand of the nature of multimodal translation. 2. analyse and solve theoretical and practical translation problems related to the use of technological tools and digital media in professional practice. 3. apply one's knowledge of translation theories and ethics in translating multimodal texts.
The University of Western Australia	TRNS5033 Corpus-based Translation Studies	The introduction of empirical databases and methodologies to the disciplines of Linguistics and Translation Studies has given rise to a rapidly growing discipline known as corpus-based translation studies. This theoretical and practical unit explores important concepts in Corpus Linguistics (CL) and Corpus-Based Translation Studies (CBTS). The methodology used in CL and CBTS entails the construction of translation databases, linguistic annotation of translation databases, quantitative exploration, and qualitative analysis of translation corpora, which lie at the heart of the development of empirical translation research. Students develop useful analytical skills for the study of translational language and learn to apply relevant analytical frameworks in the study of translation such as translation stylistics, translation universal laws and norms. The insights gained into translational language help students to develop appropriate translation strategies in practical translation. Students are able to : (1) be conversant with key concepts and methodologies used in corpus-based translation studies, the historical development of the discipline and its relationship with other branches of translation studies. (2) acquire essential skills of the construction and annotation of translation and parallel corpora. (3) develop essential quantitative and qualitative skills in the analysis of translation databases. (4) develop a corpus-based translation project and use computational software to identify new patterns in translations; and (5) apply relevant translation theories to critically analyse textual/linguistic patterns detected in translation and parallel corpora.

	TRNS5004 Translation Localisation	Translation localisation represents a rapidly growing knowledge-based industry in a large part of the world. It grew out of the intensified cross-cultural and cross-language communication in the twentieth-first century, which gave rise to new patterns of global business in terms of the design, promotion, and consumption of products, especially websites and software. Translation globalisation refers to the preparation of product that is designed for global markets, and localisation refers to the adaptation of the product for a specific market which often involves important linguistic, cultural, and technical issues. The main purpose of this unit is to help students develop understanding and practical skills in the design of websites and software for specific markets amidst the growing globalisation. The unit introduces key language and cultural issues involved in the effective design of websites. It also introduces the use of latest localisation software and encourages students to have practical hands-on experience. This is a highly practical unit and illustrative case studies are used throughout the unit. Students are asked to form teams to complete a group project which entails the investigation or pilot study of specific national markets and the consumption habits of web/media products of specific social cultural groups. Students are able to: (1) be conversant with the development of translation localisation as an emerging knowledge-based industry and its impact on people's everyday life. (2) develop awareness of the importance of language, social and cultural issues involved in localisation business. (3) develop practical skills in the design, delivery, and promotion of localised or globalised products to different national/regional markets; and (4) develop a strong sense of teamwork which is essential for their future career development in corporate settings.
	COMM5702 Digital Media: Theory and Practice	Digital Media: Theory and Practice offers students the opportunity to familiarise themselves with the technical aspects of digital technologies in order to consider how they shape communications strategies. Finding the right platform and the right tools is central to a successful communications campaign. This unit therefore considers the different technologies and social media platforms available to organisational communicators including websites, Facebook, YouTube, Twitter, and Instagram and reflects on how each of these tools shapes content and information sharing in distinctive ways. Students are also introduced to the importance of web analytics and search engine optimisation in monitoring and analysing trends in contemporary media audiences. This is a hands-on unit that will see students learn how to use a wide range of digital tools as part of developing a communications campaign. Students are able to (1) understand the theoretical, historical, and cultural frameworks in which digital communications and creative production are produced. (2) develop, use, and refine skills in a chosen area of creative production; and (3) understand contemporary processes for digital production used in industry, government and/or community settings.

	COMM5704 Global Media and Cross-cultural Communication	Effective communications strategists today need to be globally oriented, culturally aware, and capable of working in an internationalised and transnational environment. This unit provides students with a background on contemporary global media and communications environments, approaches to globalisation as a driving concept in contemporary strategy, and methods for ensuring ethical, inclusive, and effective intercultural communication. The unit may involve rehearsing collaborative engagement with students from overseas institutions and programs, and projects that are tailored for a range of communicative situations and professional contexts. Students are able to (1) understand and be aware of the global processes governing contemporary communications work. (2) develop, use, and refine skills in best-practice intercultural communication; and (3) understand and be aware of ethical, cultural, and social issues in global media and cross-cultural communication.
Western Sydney University	101750.2 Translation Technologies	This unit aims to equip students with the theoretical and practical knowledge needed to effectively apply information and communication technologies to translation and other language related tasks. It focuses on translation memory and terminology management systems, and on the workflow involved in the handling of multilingual content. Emphasis is also put on uses of the Internet as a resource tool, and to the principles of controlled language for text to be processed by machine translation (MT). Tutorials will be conducted in a computer lab where students will familiarize themselves with leading computer-assisted translation (CAT) software applications.
	101827.3 Audiovisual Translation:	This unit aims to introduce students to the framework of audio-visual translation in the form of subtitling for films, documentaries and other screen programs and captioning for hearing impaired viewers. The content of the unit will cover the principles, constraints, guiding rules, translation strategies that specifically govern subtitling and captioning. It will also introduce students to related translation theories and the application in practice. The class will be non-language specific, but students will be expected to work from and into their language other than English.

RMIT	LANG1227 Translation and Technology	This course is designed to introduce you to the technology available to assist translating practice and to familiarise you with Computer Assisted Translation (CAT) systems. You will learn how translation memory software and terminology management software can support your translation process, and will explore and practice related topics, skills and knowledge including machine translation, subtitling, and formatting. This course introduces you to tools that can support common translation tasks as required in the industry locally and globally. Upon successful completion of this course, you will be able to: • Use innovative applications in a range of technologies including computer assisted translation software • Analyse and reflect on the potential impact that technology may have on translation practice, and on the broader context of a multilingual communication environment • Apply your knowledge of the functions available for translation purposes by using translating, subtitling, editing, and formatting technology (including Machine Translation and Computer Assisted Translation systems) in order to produce industry standard translations and associated products such as subtitled videos You will be provided with the essential material and software for learning and practice in this course through our online systems and lab facilities. A list of recommended learning resources will be provided including books, journal articles and web resources. Our curriculum includes a practice of the Wordfast Translation Studio suite of tools, courtesy of Wordfast LLC and Yves Champollion. You will have access to translation memory programs and other tools that reflect current industry standards.
Macquarie University	TRAN8071 Technology for Translating	This unit is concerned with the use of technologies in the context of T&I. It introduces a wide range of techniques and skills that are relevant to using computational tools as translation aids and explores how various computational resources (such as corpora, terminology tools and translation memories) can be used to help increase translation efficiency and productivity.
ANU	LANG6002 Translation across Languages: Specialised Materials	This course investigates the problems regularly encountered in the process of cross-language and cross-cultural transfer as found in texts not classifiable as literary, and in material other than the written word. We begin by exploring genres of translation and establishing our focus on vocational, specialised, or practical forms. Upon successful completion, students will have the knowledge and skills to: On successful completion of this course, students will be able to: • Demonstrate their skills as translators of non-literary material at a high level. • Evaluate specialised texts which have been translated. • Demonstrate sophisticated understanding of the complex linguistic and cultural problems which form part of the process; and • Apply analytical and research skills at an advanced level.