Real-Time Machine-Translated Instant Messaging: A Brief Overview with Implications for Translator Training

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Abstract Over the decades, machine translation (MT) systems have contributed to improving the quality of MT output. Consequently, MT has become increasingly popular and is currently applied in more domains and fields of studies than ever before. The integration of MT into mobile communication technology, especially into real-time instant messaging (IM), a global fast-growing, and highly researched communication medium, has partially led to the elimination of linguistic barriers. Users of IM translation, who speak various languages, can now converse with each other. This chapter examines the usefulness of MT, briefly outlines current IM translation clients, and examines the impact of IM translation particularly on foreign language (FL) learning, translation theory, and translation practice. The article lays the groundwork for future research that seeks to better comprehend the crucial role of machine-translated IM in our society.

Keywords Real-time IM translation · Machine-translated IM · Instant messaging (IM) · IM translation clients · Translator training programs · Foreign language teaching

1 Introduction

Unlike decades ago, communication technology has succeeded in transforming the world in a much smaller space. When Marshall McLuhan (1962), the famous Canadian scholar, first defined the world as a "global village," he may not have imagined, at the time, the extent to which his assertion would transform to reality over fifty years later. This may be partly because, back then, the Internet was a relatively new phenomenon, computer processing was at its infancy, and the pace of technological development was comparatively slower. That notwithstanding, the drive toward overcoming cultural and linguistic barriers among different communities had begun—and has been in full throttle ever since. The desire to exchange information appears to be

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an inherent feature of human existence that technology has greatly enhanced. Over the years, Internet speed has tremendously improved, computers have become gigantic data processing machines, multiple devices like smartphones have become efficient data storage and dissemination gadgets, and humans, who are at the center of this technological revolution, have increasingly become tech savvy. Computers, either in their fixed or mobile forms, are capable of offering users an endless array of features and options. Given all these possibilities, communication between humans via the intermediary of machines has undergone a complete revolution. The development of various communication applications such as *Skype, QQ, Wechat, Wochat, ChatLingual*, and *WhatsApp* have further eased communication between smartphone owners and considerably thinned linguistic frontiers. The integration of machine translation (MT) into mobile communication applications, especially into instant messaging (IM) platforms, seems to have expanded the reach of IM exchanges to users who do not share similar languages and cultures and has had far-reaching implications in various areas of study. While a substantial volume of research publications currently exists on IM, not enough attention appears to have been given to machine-translated IM. Hence a need for researchers to fill in this void.

In this chapter, I discuss the contribution of real-time machine-translated IM in three areas—foreign language (FL) learning, translation theory, and translation practice. Given that real-time machine-translated IM is a relatively new phenomenon compared with traditional IM, it is assumed that this chapter will serve as the foundation for future discussion underscoring, among others, IM translation quality, user perceptions, and relationships with other disciplines. This inaugural contribution assesses the usefulness of MT, defines real-time machine-translated IM, and outlines its impact in FL learning, translation practice, and theory.

2 Machine Translation: Summary of Uses

MT technology is currently applied to a variety of domains including businesses some of which have integrated MT into their workflow to reduce costs and to improve delivery times (Vieira and Alonso 2018). Similarly, MT has made it possible to translate emails and other correspondences and to access multiple website contents in various languages. For instance, the US government and other governments around the world have significantly invested in MT to facilitate their overseas operations in areas where mainstream languages such as English, Spanish, and French are not spoken. One such program, the DARPA Global Autonomous Language Exploitation (GALE) program, "has developed media-monitoring systems for foreign languages focusing on Arabic and Chinese" (Jones et al. 2009 p. 41). The systems have the capability of monitoring news items on Arabic and Chinese TV channels and automatically translating them into English. MT has also facilitated voice-to-voice and voice-to-text translation with companies such as Skype (Courtney 2015) actively utilizing this feature to improve user experiences.

Another area where MT has made a significant incursion is in the domain of real-time IM. Real-time IM can be defined as "a way of communicating with one or multiple people real time using a device such as a computer or mobile phone" (Maximo and Edney 2007, p. 7). Generally, real time exchanges are assured via "an Internet protocol (IP)-based application that provides convenient communication between people using a variety of different device types" (Rittinghouse and Ransome 2005, p. 3). Due to the popularity of MT, many scholars have investigated its effects in today's society and on people of all walks of life. Based on empirical evidence from a considerable body of research, IM has been found to be popular among adolescents and young adults, and, to a lesser extent, adults (Church and de Oliveira 2013; Dolev-Cohen and Barak 2013; Iversen et al. 2013). Some of the most outstanding reasons for its popularity are synchronicity (the fact that conversations among users take place almost instantly); dyadic relationships (the ability for two or more users to communicate "privately"); and the multiplicity of options including instant or real-time file transfer, voice messaging, instantaneous photo sharing, video chat, and location sharing.

The integration of MT into IM applications has boosted the possibility to translate IM across multiple languages thereby offering users the option to exchange information irrespective of the languages they speak. The advent of MT in the social media sphere is viewed by some as the future of global communication (Alufa 2012) and has warranted further investigation by researchers (Aiken and Ghosh 2009; Calefato et al. 2010; Tekwa 2018; Yang 2011).

3 Definition, Uses, and Evolution of Real-Time Machine-Translated IM

Real-time machine-translated IM can simply be defined as the ability for computer applications to instantly translate IM from one language into one or multiple languages during a chat session between two or multiple interlocutors. Practically speaking, it is the possibility for an IM user who speaks, say English, to simultaneously engage in real-time IM exchanges with a fellow user who speak Spanish, for instance, or several users who speak Spanish, German, and Italian, respectively. It is worthy to note that it is such a speedy way to communicate by bringing together multiple users and multiple languages that underscores the ubiquity of mobile communication in a globalized world. Interest in developing cross-language translation applications may have been spurred by the increasing number of IM users around the world. As a matter of fact, according to the Geneva-based International Telecommunication Union (ITU), the UN's specialized agency for Information and Communication Technologies (ICTs), the number of global Internet users by the end of the year 2019 was approximately 4.1 billion[1] up from 1.1 billion reported in the

[1]Information obtained on Feb. 10, 2020 from https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx.

year 2005. Secondly, the availability of smartphones and other mobile devices with IM capabilities has made it possible to communicate instantly and from virtually any location where Internet access is available. Thirdly, the availability of WIFI in public spaces such as airports, restaurants, libraries, supermarkets and schools has multiplied the chances to exchange instant messages even in the absence of a duly subscribed mobile data package. Fourthly, as communities, institutions, and countries deepen collaboration ties in response to global challenges, the need to collaborate by overcoming linguistic barriers has become urgent. For example, in the area of education, there is greater collaboration among higher institutions of learning today than there was a decade ago (Bozeman et al. 2013; Fantino et al. 2015). Furthermore, in a globalized world where outsourcing has become the norm and market competition has intensified, it is important, for companies and financial institutions, to ensure that information exchange among various branches and offices located in different parts of the world is smooth and rapid. Language barriers could impose far-reaching problems to companies especially patterning to the buying and selling of goods and to their ability to provide services (Valarezo et al. 2018). To partially resolve this issue, companies could employ real-time machine-translated IM to foster internal communication and to overcome linguistic barriers. Real-time machine-translated IM could also enable companies to (1) cut the high cost of translation services often provided by specialized translation companies; (2) save time as human translators and interpreters may lack adequate terminological competence in certain areas and, consequently, need more time to familiarize themselves with specialized terminology and phraseology; (3) restrict the sharing of internal confidential company information with outsiders even when they happen to be translators and/or interpreters (Feely and Anne-Wil 2003; Marschan-Piekkari et al. 1999).

Finally, real-time machine-translated IM is growing in popularity partially due to the fact that some users are simply intrigued by other cultures and languages. As a result, they actively seek to make new friends in different parts of the world and to learn foreign languages. Therefore, the translation of sentences or chunks of sentences may enable learners to improve vocabulary, sentence structures, and foreign language (FL) willingness to communicate (Tekwa 2018; Wu and Kawamura 2011).

Real-time IM translation has evolved significantly over the years. Early users had to communicate by cutting and pasting IM from an IM tool or text field unto a separate translation program which translated the message into the target language. The translated message was then cut and pasted back on the IM tool before it was sent to the recipient. This phase was followed by the integration of servers in the IM network. Servers were responsible for translating messages—words, chunks, or entire sentences—from sender to recipient. The procedure was fairly simple-the sender keyed in the message, specified the destination language, then sent the message to the server. For its part, the server translated the message into the specified language, sent it back to the sender who then forwarded it to the recipient. As Jonas Seme (2001, p. 1), author of U.S. Patent Application No. 10/035,085 noted in 2003:

> … the time required to perform this process makes this implementation impractical for "real time" (instant) communication. This is because the procedure requires more processing and network resources to be expended, and also introduces extra hops between the client and destination device. Moreover, such systems limit the ability for a user to send messages to multiple users of different languages simultaneously. (Seme 2001, p. 1)

Current real-time IM translation applications have been designed to instantly translate messages from one sender to one or multiple recipients in one or more target languages. The fundamental difference between regular IM and real-time IM translation lies in the use of a content translation module which can be located at the source device (desktop, laptop, mobile, personal data assistants) or at the destination device. The content translation module can be defined as:

> A computer-executable module (e.g., DLL, exe), and contains instructions for translating messages from a language familiar to the user of the source device (source language), to a language familiar to a user of the destination device (destination language). (Seme 2001, p. 1).

During the IM session, user profiles are exchanged between the source and destination devices including information such as language preferences. Messages sent from the source device are then translated by the content translation module as per the information and settings of the destination device before they are forwarded to the recipient. This way, the communication process is faster and it occurs real-time (Seme 2001). Alternatively, the content translation module could be located anywhere along the IM network. Once the source and destination user profiles have been exchanged and set within the translation module, it is possible to instantly translate any message and to forward it to the desired recipient in the language of their choice.

4 An Overview of Some IM Translation Clients

The list of companies that provide IM translation services has been on the increase over the years. As more individuals and organizations tend to use IM for various purposes, companies have realized the need to provide IM translation services and to diversify the features offered on various IM platforms. This section examines the main characteristics of some of the most popular real-time IM translation applications currently available in the market based on the following features: price, device compatibility, languages offered, group conversation options including group sizes and the suitability of the IM translation application in enhancing scholarly research.

Price and number of users: The price is the monetary amount required to obtain both the IM translation application and related services (premium services for some clients, for example). Amounts could be one-time payments or monthly subscriptions. Clients that provide free and open-source IM translation applications such as WeChat, QQ International and Skype Translate may, arguably, be more popular among registered users than clients whose applications are expensive to acquire or

those, like Sendboo, that charge a fee for upgraded services. The number of IM users refers to subscribers who actively use the IM translation application.

Device compatibility: Mobile devices are among the most widely used communication tools today (Duggan 2015). This explains why it is relevant for a provider of IM services to make it possible for users to download and install the application on multiple devices. For research purposes, interoperable IM translation applications that work with multiple operating systems such as WeChat, QQ International, Skype, Wochat, Chatlingual, and Sendboo could be preferred over applications like Lringo that are only available on Android operating systems.

Language combination: This refers to the number of source and target language combos offered by IM translation clients. Based on the assumption that more languages could translate into potential users, the number of languages offered becomes relevant given its potential to reflect the popularity of the IM translation application. Furthermore, the languages offered may, arguably, explain the popularity of certain IM translation applications in different parts of the world. This is definitely important, but the language combination (which languages can be translated into which) appears to be paramount. For researchers interested in this area, the translation process, per se, could be of considerable importance. Questions like: At what point in the communication process are messages translated? Are they translated before they are sent, or after they are sent? Do senders view translated messages? Can messages be modified prior to sending? Does the platform store the chat history? How long can conversations be stored? Can the chat history be downloaded or exported? If yes, in what formats? For researchers, the choice of any machine-translated IM application may well hinge on answers to these questions. There is little doubt that for research purposes, the possibility to visualize both the source and target IMs and the capability of downloading and storing data for analysis are capital.

Group chat option: This refers to the IM feature that brings multiple users together so they can communicate in a threaded conversation. Group chat enables members to exchange IM, leave voicemails and share photos, files, videos on the same chat window. It is an essential feature for users who have common interests, share common values, belong to the same association, company, or institution, and take the same courses in school because they can easily and quickly share vital information. For example, a simple message about a change of schedule could simultaneously be sent all 500 members on a Wechat group or to all 200 members on a QQ chat group.

Some of the most popular IM translation providers include WeChat and QQ International, both China-based IM applications that serve millions of predominantly Chinese users, Skype Translator that is popular world-wide especially for its capability to transmit voice-to-voice translations, Sendboo, Chatlingual, Wochat and Lringo. Majority of these are free open-source IM translation applications though some, including Chatlingual, are essentially designed for businesses as outlined in Table 1 below.

Table 1 Summary of IM translation applications

Clients (in millions, as per Feb. 16, 17)	Languages	Price	Device compatibility	Incoming/outgoing translation	Group IM function
WeChat (1.2 + billion)[a]	21	Free	Computer/mobile/applications	Long press on received message to have it translated Messages can be stored but cannot be downloaded to a computer, for instance	Group option available for up to 500 members
QQ International (1 + billion users[b])	50	Free	Computer/mobile devices + apps	Translate then send/Inline translation Possibility to back up messages, download, and save	Yes Maximum of 200 users
Skype translator (300 million[c])	51	Free Skype to Skype	Computer	Translate then send—can only see one message at a time. Capable of storing and retrieving messages	Available unlimited numbers from contact
Lringo+	27	Free	Computer/mobile/app	Translation done after message is sent. Messages cannot be stored	Yes
Chatlingual	50+	Free 14-day trial	Mobile/computer	Incoming message translation. Sender does not see their messages and translation. Messages can be stored and retrieved	Yes
VoxOx	50	Calling/Texts IM, etc., are free	Mobile app/computer	Only one person uses the IM translation option	Unavailable

(continued)

Table 1 (continued)

Clients (in millions, as per Feb. 16, 17)	Languages	Price	Device compatibility	Incoming/outgoing translation	Group IM function
Sendboo	30	Premium account costs USD$3.99 a year	Computer/mobile app	Messages are sent, then translated prior to reception	Yes

[a]*Source* Statista https://www.statista.com/statistics/255778/number-of-active-wechat-messenger-accounts/ (Accessed on Aug. 20, 2020)
Source: https://www.imqq.com/English1033.html (Accessed on Aug. 20, 2020)
Source: https://techcrunch.com/2016/03/30/microsoft-is-bringing-bots-to-skype-and-everywhere-else/ (Accessed in March 2018)

5 Instant Messaging and Foreign Language Learning

IM is currently one of the most widely used methods of keeping in contact among friends, family, colleagues and classmates. Some of the largest groups of users are students who depend on IM for curricular and extra-curricular activities (Jones 2008). Marianne Foley (2011)[2] who has investigated the curricular use of IM to provide library referencing material to college students maintains:

> Statistics show that two of the target populations, young people and students in cybraries, used the service heavily. Although the majority of patrons were on-campus, comments indicated that off-campus users included distance education students, another group the project had hoped to reach (p. 44).

As far as the level of satisfaction with the service is concerned, Foley (2011, p. 41) maintains, "in fact, 71% declared themselves satisfied or better compared to 10% who registered some level of dissatisfaction." She further clarifies that most of the unhappy users had, in fact, attempted to access the service late at night when it was closed.

Other curricular uses of IM include online learning where "students can stay in touch with their tutors and with each other while they are away from the classroom" (Kadirire 2007, p. 2.). Some teachers have created online forums where interactions in the classroom are often continued online in a chatroom-type environment where students can share assignments, exchange ideas, ask and answer questions either among peers or interact with their teachers. Communication within these online groups is often real time with members posting messages in turns in a single thread. Documents of various forms and sizes and pictures are also often shared among group members. The size of each group depends on the number of students taking the course but also on the IM client capacity. The popular method of communication in these online classrooms is IM since most clients can host scores of users in a single chat forum. Students also use IM to "communicate or locate other people while in indoor environments, for instance, in a meeting room, lecture theatre, or inside a large building" (Kadirere 2007, p. 2).

As Flanagin (2005) argues, IM is used in a variety of extra-curricular situations besides maintaining contact with families and friends. For instance, students sometimes use it for entertainment purposes including sharing music, jokes, recorded humorous actions, funny pictures, and stories. Besides serving as a platform through which users meet and even develop friendship, IM also plays a large social gratification function (Ramirez et al. 2008). Social gratification is the deliberate use of different forms of social media to achieve specific goals and to satisfy specific needs. Users acquire satisfaction when they take initiative and when they develop affinities with specific media. Subsequently, they become aware of their media use and can fairly detail their online activities (West and Turner 2010).

[2]Marianne Foley is the systems librarian at SUNY College in Buffalo, USA.

The impact of IM on FL teaching and learning has continued to be of interest to researchers (Quan-Haase and Young 2010). Researchers suggest that the ubiquitous nature of IM partially accounts for its popularity among students. It is also popular "because it is a synchronous medium … simulates face-to-face conversation, particularly in its informality" (Godwin-Jones 2005, p. 17). The informal nature of IM exchanges could help learners to improve FL skills. Guerra (2014) affirms that with IM communication, "messages are typed, sent, and received instantaneously, bringing the electronic communication exchanges from the static to the more dynamic, and thus more closely resembling oral interaction (p.1)" Consequently, some language teachers are increasingly aware of the need to integrate IM technology into the classroom. Among others, researchers now agree that IM,

> …provides the opportunity to interact and learn with and from people from different cultures and different native languages. On the other hand, while using these means of communication, students get prepared for the use of web tools, which is an added value for their future as professionals in any area (Gonzalez 2003, p. 57).

The importance of IM exchanges is so crucial that "…some language instructors are sending their students out to find IM partners, recognizing that this is a tool students know and like to use," (Godwin-Jones 2005, p. 17).

Synchronous IM could also contribute to developing language skills because learners interact with real audiences as they simultaneously receive input and produce output (Gonzalez 2003). These exchanges may expose learners to FL vocabulary and sentence structures and positively influence their oral linguistic abilities. Learners equally have the opportunity to receive instant feedback from interlocutors who, unlike in traditional classroom settings, may be located in different countries and could also be native speakers of the language.

There is little doubt why researchers are becoming increasingly interested in examining the impact of IM on the FL classroom and in its effectiveness as a communication tool. Research on the relationship between IM, FL and culture have particularly focused on the development of linguistic skills, intercultural relationships, and behavioral patterns within the FL learning environment. Several scholars including Luis Guerra (2014) and Fernandez and Yuldashev (2011) have investigated the impact of IM on various aspects of FL learners' identity formation and writing skills while Thorne et al. (2009) and O'Dowd (2007) have focused on the relationship between IM and behavioral tendencies as well as sociocultural interactions among FL learners.

In 1995, research conducted by Kern (1995) on the impact of synchronous CMC on language learning revealed that learners were quite capable of improving their language skills. As Kern (1995, p. 470) states, "students' language output was at an overall greater level of sophistication in terms of the range of the morphosyntactic features and in terms of the variety of discourse functions expressed." Sotillo (2013), for her part, evaluated the use of the text-based chat and audio features of IM to provide corrective feedback to EFL learners and found that:

> corrective feedback made available to L2 learners by their NS or NNS partners using Internet IM tools allows learners to detect a deviant use of a certain lexical, grammatical, or semantic form in their second language output, and research has shown that this may facilitate second language development.

Sotillo (2013) added that when corrective feedback is provided to learners, most learners tend to quickly integrate the feedback in their exchanges making language development arguably more effective than in traditional language classrooms where learners do not always have the opportunity to practice new language elements. Other researchers including Salaberry (2000) have, likewise, underscored the fact that communication via synchronous IM on IM platforms has tended to be more productive than in-class face-to-face communication.

Another area where the impact of IM is especially felt is long-distance virtual FL learning. Globalization has contributed to facilitating communication in the world. Consequently, the ability to find language partners to learn and practice a foreign language or to enrol in various courses is more feasible today than it was several decades ago. Those interested in studying the Jewish religion, for instance, are able to learn the Torah in a variety of ways. They can ask "a 'rabbi' a question through e-mail or instant messaging, participate in a real-time Torah chat with a virtual learning partner…" (Goodman and Katz 2004, p. 213).

As far as collaborative FL learning through virtual classrooms is concerned, it suffices to mention that several projects have been created within universities and colleges (Cziko 2013; Kessler et al. 2012) to facilitate such an endeavour. Telecollaboration projects, as they have come to be known (Helm 2015), fundamentally utilize synchronous and asynchronous communication platforms to develop language skills among learners spatially dispersed around the globe. As Kern (2015) remarks, despite shortcomings such as the movement of students within the context of student-exchange programs and the inability of some universities to offer reliable telecollaboration tools, telecollaboration has led to "increased motivation and linguistic output, gains in language development, accuracy and fluency, intercultural communicative competence, pragmatic competence, learner autonomy, online literacies, and multimodal communicative competence" (p. 198).

Some companies, for commercial reasons, have designed platforms that bring together learners, teachers, and language partners with IM serving as the core data exchange component. Two examples are the Livemocha project (Islam 2011), Tandem,[3] and Mylanguageexchange,[4] the Montreal-based virtual communication platform. Tandem and Mylanguageexchange bring together FL language learners and tutors worldwide in virtual classrooms to communicate via IM or face-to-face. The online multilingual platforms provide a curriculum with specifically developed learning goals and objectives. Learners are free to subscribe, search for partners and/or instructors and begin exchanging information. The integrated real-time IM translation tool (for Tandem) enables users to arrange chat sessions, store and retrieve the chat history, and easily insert accented characters. Tandem claims to have brought together millions of foreign language enthusiasts from over 150 countries who communicate in over about 160 different languages.

Besides a general discussion on grammar and use, researchers have also focused on IM and specific FL and culture-bound concepts. For instance, Pin-hsiang Natalie

[3] https://www.tandem.net/ (Accessed on Feb. 10, 2020).

[4] https://www.mylanguageexchange.com/Default.asp: Accessed: Feb. 09, 2020.

Wu[5] and Michelle Kawamura[6] have evaluated the use of IM to improve WTC, intercultural communication and cultural awareness. In their study, they found that IM use "successfully increased students' willingness to communicate cross culturally…" (Wu and Kawamura 2011). Similarly, Lily Compton (2004) of Iowa State University has analyzed how IM could help students to improve willingness to engage in FL oral interaction. She concludes that "online chatting … could be used to promote oral proficiency by increasing EFL learners' willingness to take risks through visual preparation, i.e. seeing and organizing their ideas in print and reducing their anxiety level…" (p. 49). These studies both reveal the importance of integrating IM into the FL classroom as a way of improving learner WTC.

6 Real-Time Machine-Translated IM and the Translation Profession

This section examines the impact of real-time machine-translated IM on translation practice and translator training. First, the relationship between IM translation and job gains and losses is examined followed by how translator training programs may align curriculum objectives with IM translation within the current fast-evolving communication landscape.

6.1 Job Losses and Gains

The singular most important aspiration of real-time machine-translated IM clients is to provide instant translation services across numerous languages at an affordable rate. The haste to eliminate translators and interpreters, in part because they are costly and slow, remains a core marketing strategy. Therefore, for language service providers including ChatLingual that view time as money, IM translation is the natural pathway to providing fast, effective multilingual services to multiple businesses at a fraction of the cost (Calimlim 2013; Broida 2013). In a February 2013 article on PCWorld, Erick Broida, author of dozens of publications on technology, emphasized Sendboo's ability to replace human translators:

> So you're looking to work with an overseas supplier for parts. Or you need to hire a programmer whose English is fractured at best. Now what? Do you really need to hire a translator just so you can communicate with these folks? Nope: Hire an app instead. Sendboo … translates text messages in real-time, effectively turning the language barrier into a language floodgate. Now you can communicate with pretty much anyone, anywhere, as long as they have a smartphone or tablet. (Broida 2013, paras 2–3)

[5]Pin-hsiang Natalie teaches at Chien-kuo Technology University, Taiwan.

[6]Michelle Kawamura teaches at Ritsumeikan University, Japan.

Furthermore, IM client developers seem to direct their publicity at companies and institutions that hire human translators and interpreters. They intend to take advantage of the increasing number of companies that, with globalization and outsourcing, have set up overseas offices and branches and now require translators and interpreters for in-house communication, B2B communication, and B2C communication.

Besides appealing to multinational companies, real-time IM translation clients hope to attract organizations that rely on translators and interpreters for their day-to-day operations such as doctors without borders. As a matter of fact, Justin Custer, ChatLingual founder, has underscored the necessity to use real-time IM translation to improve global business, improve the services provided by multinational NGOs and by the travel industry. In an interview, he maintained:

> Organizations with more than one voice, like Médecins Sans Frontières, Rotary Club and the United Nations have millions of people all over the world working together for one cause. The challenge now is that communication is limited to those who speak the same languages (Chau 2013).

The argument to be made is, in the short term, there could be a reduction in the number of translators hired if businesses, international, and regional organizations were to turn to IM translation clients to meet their immediate and basic communication needs. Similarly, companies in the tourism business may need fewer translators and interpreters at an age where machine-translated IM applications have inundated the industry and where tourists can effectively communicate via the intermediary of real-time translation applications (iTranslate, SayHi, WayGo, Microsoft Translator, Google Translate, Viber, Skype, etc.). Given the versatile and multifunctional nature of these applications as well as their cost, reliability, and output quality, it is fair to conjecture that as real-time machine-translated IM output quality improves, the demand for human translators and interpreters may tend to decline particularly in certain areas (tourism and emergency relief operations). At the same time, turning to machines rather than humans to translate could, in the long term, have negative effects on the profession. Given that many IM translation applications are free and open source, companies and institutions could be tempted to reduce translation budgets and reduce the number of translators and interpreters they hire. They may also tend to reduce the rate at which they use the services of translation agencies. Furthermore, as real-time machine-translated IM produces instant results, companies that require translation services may tend to expect the same quick turnover from human translators. The high client expectations could lead to the tightening of deadlines thereby increasing the existing pressure on today's translators and interpreters (Johnson 2017; Moorkens 2017; Vieira 2018).

The translation profession, in the age of fast-evolving technology, needs to constantly reach beyond its traditionally defined confines. That means program designers need to consistently search for technology-driven opportunities and to systematically redefine training goals and objectives to optimize employment opportunities for young graduates. While it appears fair to argue that some translation and interpretation jobs will be lost, it is equally relevant to emphasize that real-time IM

translation clients do offset the losses by offering exciting opportunities for translators and interpreters with the right skill sets. The true extent of these losses and gains, or their exact impact on the translation industry, remains to be determined but it suffices, at this juncture, to highlight potential job openings for translators and interpreters within multiple departments of real-time IM translation clients (Tencent for QQ International, Viber, Chatlingual, Microsoft for Skype). The ability to understand two or more languages is a competitive edge translation schools need to capitalize on while designing programs that enable students to acquire knowledge in specialized areas including engineering, content writing, technical writing, programming, human relations, sales, and public relations.

6.2 Rethinking Translator Training Programs

The adequate training of translators and interpreters is essential to the very existence of the profession. The establishment of the first translation schools in the 1940s, at a time translation studies, as a discipline, began to take shape, testifies that, besides the knowledge of two or more languages, certain skills and competences were required in order to translate (Pym, 2013; Schäffner and Adab 2000). However, the literature on translation training courses points to a lack of uniformity in the design and teaching of translation programs across the globe (Bowker 2014; Pym 2011). Admittedly, national and regional factors affect the way people translate, negotiate translation contracts and receive payment for work done. Therefore, current and future translators need to be aware of these professional and market-oriented challenges. That notwithstanding, the translation process per se, i.e., the actual transfer of meaning from one language to another, requires a more harmonized curriculum than training institutions currently offer. While different scholars advocate for different approaches to translator training, translation teachers seem to have no consensus on the selection of texts and on the grading of students' translation tasks. Furthermore, it is virtually up to training schools to determine at what level of training certain courses is taught (Chan 2014; Lei 1999).

Current developments in technology require a shift of focus in translator training programs toward areas where future demand lies (Bowker et al. 2008). This requires translation schools to periodically re-evaluate their programs and to make changes that reflect current market trends. For instance, training schools may need to adopt a flexible approach in designing translation courses by eliminating unnecessary bureaucracy which occasionally slows down reform implementation. Course-design flexibility needs to align with constantly evolving technology as a way to pre-empt future trends and practices. Real-time machine-translated IM may be relatively novel, but it has the potential to evolve into the communication norm given that technology redefines trends and changes habits. Hence, the integration of IM translation into the curriculum, as part of machine translation training, is a way to ensure the profession advances at the same pace with technological development and societal changes.

How can real-time machine-translated IM be integrated into translator training programs? Possible ways would include training students to understand how real-time IM translation works and preparing them to work with/for IM translation clients that are consistently searching for new talent. With the increasing number of machine-translated instant messaging applications, particularly those intended for tourists (iTranslate, TripLingo, SayHi, Papago, Speak and Translate, etc.), there are numerous collaboration opportunities between translation programs and companies that provide IM translation-based software and hardware. These companies definitely require language experts at the design and testing phases and would continuously want to improve the quality of their translations by working with language professionals.

Besides, translation programs certainly need to introduce more technology-based courses. Currently, most programs appear to be focused on the teaching of CAT tools and, to a certain extent, localization. While not downplaying the crucial importance of CAT tool and localization training, it is worthy to emphasize the need for training institutions to realize that IM translation (voice and text) represents the future of travel and that IM translation clients certainly need employees with a wide-ranging skills set besides the knowledge of two or more languages. Therefore, knowledge of basic programming could be included in the translation curriculum. Students could be taught programming software including Python, JavaScript, Java, C++, etc. that are important to all IM translation clients. Knowledge of programming language and knowledge of several languages will certainly give graduates a high competitive edge over other job seekers in this area.

Furthermore, knowledge of database systems, as well as technical writing, would be instrumental for graduates wishing to work with companies that design IM translation software. Database system courses naturally include artificial intelligence, Big Data and database (including SQL database, Oracle, MongoDB) systems. Besides database system courses, trainees require knowledge in technical writing in a variety of areas. Generally, IM translation clients are in need of content writers and copywriters for the purpose of marketing their products. Courses in technical writing could focus on developing trainee skills in writing advertising content, user guides, frequently asked questions (FAQs), and providing technical descriptions of devices. It is essential to emphasize that even though trainees do not have expert knowledge upon graduation, they would certainly be capable of building on the knowledge they obtain in the training schools however rudimentary it may be.

In today's world, translator training would be incomplete if institutions focus solely on the teaching of hard skills. As a matter of fact, there is an ever-increasing need to assist trainee translators and interpreters in developing soft skills or employability skills that have become obligatory in an ever-evolving, technology-based, and dynamic marketplace. Training institutions of today are obliged to develop the communication and media skills of trainees and, at the same time, they have to ensure that trainees acquire interpersonal and teamwork skills, learn how to work under pressure, adapt to flexible schedules, multitask and excel in multicultural work settings (Cinque 2016; Johnson 2017; Kic-Drgas 2018; Marczak 2018; Pym 2011; Pym 2013).

7 Conclusion

IM translation appears to be following in the footsteps of IM especially in terms of its popularity and its ubiquity. The proliferation of IM translation applications, in business in general and in the tourism industry in particular, clearly indicates how new trends can reshape the translation profession. Therefore, rather than sit back, or develop a wait-and-see attitude, translator training programs need to act now by aligning the curriculum with current and future market demands. This chapter defined real-time machine-translated IM, briefly outlined current IM translation clients and examined the impact of IM and real-time IM translation on FL and translation. The analysis focused on job losses and gains and on the need for training programs to adjust to a marketplace that consistently follows the contours of technological evolution. In this chapter, it is argued that the ubiquity of IM translation, both voice and text, could reduce the need for human translators and interpreters in certain industries and institutions, and also increase existing pressures on professional translators. On the other hand, it is suggested that translators and interpreters acquire training that equips them with a versatile skill set to fill positions not traditionally reserved for translators. This is possible via the identification of areas where expert knowledge or even rudimentary knowledge is necessary and susceptible to supplement the linguistic competence of future graduates and to increase their competitive edge when they seek for employment. In the domain of machine-translated IM, it is recommended that training institutions improve collaboration with IM translation application developers as well as IM translation service providers. In addition, specialized courses in artificial intelligence, Big Data, database systems, technical writing, and soft skill training are essential in preparing future translators and interpreters for the exigencies of current and future global translation markets. This chapter lays the groundwork for further IM translation-related research in areas including but not limited to IM translation quality, user perceptions and the relationship between IM translation and other disciplines.

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