

Lost in Machine Translation: The Promises and Pitfalls of Machine Translation for Multilingual Group Work in Global Health Education

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Abstract

The rapid adoption of online technologies to deliver postsecondary education amid the COVID-19 pandemic has highlighted the potential for online learning, as well as important equity gaps to be addressed. For over ten years, McMaster University has delivered graduate global health education through a blended-learning approach. In partnership with universities in the Netherlands, India, Thailand, Norway, Colombia, and Sudan, experts from across the Consortium deliver lectures online to students around the world. As the Consortium has expanded, we have reflected on how artificial intelligence can be harnessed to integrate multilingual group work into course offerings, challenging the dominant use of English as the principal language of instruction in global health education. In 2020, two courses were piloted with small groups of students from Canada and Colombia using machine translation supported by bilingual tutors. Students met weekly via video conferencing software, speaking in English and Spanish and relying on machine translation software to transcribe and translate for group members. Our experience as tutors and instructors in these multilingual groups highlights the potential for machine translation to bridge language divides, while also underscoring the limitations of currently available technology. Further research is needed to investigate the potential for machine translation in facilitating multilingual online education as a pathway to more equitable and inclusive online learning environments.

1. Introduction

The COVID-19 pandemic forced postsecondary institutions around the world to transition rapidly to online delivery of graduate education [1–4]. For many, the transition was uneven and jolting, with issues ranging from technical challenges, such as unreliable internet connectivity, to cumbersome digital platforms, and lack of familiarity with digital technologies [5–7]. Extensive literature also documents the ‘digital divide’, or the differential access to, and ability to use, modern information and communication technologies [8,9], which reinforces prevailing class and social inequities both within and across countries [10–12]. The transition to online education amid COVID-19 may exacerbate these inequities, so educators should consider these barriers when planning and implementing online teaching. There is value in looking to the experiences of educators delivering global and public health education online prior to COVID-19 to forge a path forward.

In 2010, McMaster University (Canada) and Maastricht University (The Netherlands) formed a higher education Consortium that researches and teaches globalization and health [13]. Consortium members include Manipal Academy of Higher Education (India), Thammasat University (Thailand), the University of South-Eastern Norway (Norway), Universidad del Rosario (Colombia) and Ahfad University for Women (Sudan), capitalizing on the expertise at each higher education institution to offer a unique model for graduate education. Each institution offers its own graduate program in global or public health, with two core courses shared across the Consortium, Foundations of Global Health I & II. In these two courses, global health experts from across the Consortium deliver lectures, which are streamed via video conferencing software for students around the world to watch synchronously and are recorded for students to stream asynchronously at their convenience. Group work is also central to these courses;

McMaster students are assigned to groups with students from Maastricht University or Universidad del Rosario. Groups meet online weekly with a tutor to review course readings, discuss lecture material, and complete group assignments.

2. Machine Translation As A Teaching Tool For Multilingual Group Work

While addressing issues of equity in bridging the digital divide across age, gender, race, and class have proved important, our experience as tutors and instructors in the Consortium brings into focus a more subtle equity gap to be addressed in global health education: the *de facto* use of English as the primary language of instruction, and the additional intellectual labour this imposes on non-Anglophone learners. For example, non-Anglophone learners described additional time spent re-reading course materials, seeking literature in their native languages to support their understanding, and working with online translation tools to complete assignments in English. Non-Anglophone learners described reviewing lecture recordings multiple times to understand course materials, as well as a reluctance to lead, or even participate in, small group settings due to language barriers. In response, in 2020 the Consortium piloted the use of machine translation as a tool to facilitate multilingual group work with small groups of students from Canada and Colombia, supported by bilingual tutors. Colombian students were encouraged to participate in group meetings fully in Spanish, utilizing *Microsoft Translator: Communications* to translate and transcribe speech for English-speaking group members. Tutors attended group meetings to support with translation, clarify misunderstandings, and explain course concepts.

Implementing this transnational, multilingual, blended-learning initiative has not been without challenges. Coordinating group meetings involves navigating five time zones, and for many students is the first time working virtually in international groups. Tutors are from across the Consortium, so regular communication between course coordinators and tutors was crucial to ensure consistency across groups. Moreover, licencing for required learning management software was negotiated at each institution to ensure all students had access to lectures and tutorials, which necessitated Maastricht University undertaking additional administrative labour. There are also ongoing dilemmas surrounding how to update curricula in a course shared by six universities, three of which are in the global South.

Montenegro et al. [14] argue that although in recent years there have been calls to decolonize global health interventions and acknowledge colonial power relations in global health academia [15], less focus has been paid to decolonizing global health education. This endeavour requires an intentional challenging of the effects of colonialism which has reinforced inequitable power relations in global health education [16]. We acknowledge the tension in writing about decolonizing global health education from a global North university, but this brief communication is intended to begin the work of reflecting on ways we can harness the potential of machine translation into our teaching to challenge the use of English as the principal language of instruction in global health education. We are now at a pinnacle moment, both with the potential for artificial intelligence technology to facilitate multilingual group work,

and with the rapid global transition to online learning, to assess the potential for machine translation to circumvent inequities produced by using English as the principal language of instruction in global health education.

3. Methodology & Methods

Research design followed a realist evaluation [17] to evaluate what works, for whom, under what circumstances, and why. Qualitative, semi-structured interviews were used to assess: (1) how machine translation can be harnessed to improve online, international global health education, and (2) to explore the experiences of students and tutors utilizing machine translation software to conduct multilingual group work. Global Health students, tutors, and program directors from McMaster University (Canada) and Universidad del Rosario (Colombia) who were involved in the multilingual pilot project in 2020-2021 were invited to participate. Interviews were conducted via video conferencing software (Zoom), audio recorded, transcribed verbatim, and coded in their original language. Interviews were conducted in either English or Spanish by bilingual study staff. Thematic analysis [18] was utilized to identify, analyze, and report themes identified in the data. Codes were organized and applied to transcripts using qualitative analysis software Dedoose.

4. Results

Semi-structured interviews were conducted in either Spanish or English via video conferencing software with 11 participants, including three program coordinators from McMaster University, Maastricht University, and Universidad del Rosario, one tutor from McMaster University, two students from Universidad del Rosario and five students from McMaster University.

4.1. The Promises and Pitfalls of Machine Translation

Recent innovations in artificial intelligence (AI), and specifically machine translation, show promise for the creation of more inclusive and equitable online learning spaces in global health by allowing learners to speak their native language. At its core, AI refers to the ability of machines to carry out complex tasks typically requiring human intelligence [19]. Supported by AI, machine translation requires only a computer, smartphone, or device connected to the internet and allows for more intelligent and nuanced translations [19]. While little is known about the mechanics and outcomes of courses using machine translation, Australian and Indonesian medical students engaging in online communication tools and platforms identified real-time machine translation as a tool that facilitated fluid conversations between non-English-speaking and English-speaking groups [20].

Preliminary findings illustrate the potential to capitalize on the strengths of machine translation to reduce inequities produced by teaching global health predominantly in English. Partnering students from McMaster University (Canada) and Universidad del Rosario (Colombia) together in virtual learning pods with tutors who are fluent in Spanish, groups communicated using *Microsoft Translator: Conversations*.

McMaster students, often with limited skills in written and oral Spanish, communicated with Spanish-speaking group members using machine translation, and with the assistance of the tutor. Students were resourceful and adaptable in navigating multiple communication technologies, relying on *WhatsApp* for group communication, *Google Docs* to collaborate on assignments, *Zoom* or *Google Meets* for group meetings, *Google Translate* for text translation, and *Microsoft Translator: Communications* for live translation during group meetings. Students emphasized that the multilingual component of group work contributed to “improved communication skills and ability to work in groups” and described multilingual group work as “richer” than previous experiences with group work. Students also described learning about other cultures as an important outcome of multilingual group work, which was noted during interviews as “essential” for work in global and public health. Canadian students emphasized gaining greater understandings of health challenges in Colombia, while Colombian students noted the ability to work with global North institutions as crucial for future work with multilateral funding agencies.

Significant limitations with currently available machine translation technologies were noted across the interviews, with *Microsoft Translator: Communications* being described as “ineffective”, “time-consuming”, and “inaccurate”. In line with the literature on the digital divide [8], some students noted their age or lack of familiarity with technologies as key barriers in adopting machine translation software. Given these challenges, some groups abandoned translation technologies and relied solely on bilingual tutors and group members to translate. Students also underscored the challenges in translating cultural contexts that do not necessarily have a linguistic equivalent in English, resulting in local meanings being lost in machine translation. For example, Colombian students described difficulties in translating concepts from Indigenous traditional medicines, and often relied on terminology from Western medicine when translating to English.

5. Conclusion

Despite technological challenges associated with online group work and machine translation software, participants underscored the value in cross-cultural and multilingual collaboration. Further analysis is needed to better understand the promises and pitfalls for machine translation software to facilitate multilingual group work in postsecondary education. Through this pilot project, we sought to assess: (1) how machine translation can be harnessed to improve online, international global health education, and (2) to explore the experiences of students utilizing machine translation software to conduct multilingual group work. Further thematic analysis will continue investigating the potential for machine translation powered by artificial intelligence to circumvent inequities resulting from the use of English as the *de facto* language of instruction in global and public health education.

Declarations

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Conflicts of Interests: No conflicts of interest declared.

Ethical Approval: Protocols and study materials were approved by the Hamilton Integrated Research Ethics Board at McMaster University (IRB# 11510) and the Comité de Ética en Investigación de la Universidad del Rosario (DVO005 1575-CV1412).

Consent for Publication: All participants provided written consent prior to participation and were informed, as part of the consent process, that data may be used for publication. No personal identifiers have been included in this manuscript.

Informed Consent: All participants provided verbal informed consent prior to participation.

Data availability: Not applicable

Code availability: Not applicable

Authors contributions: EZLR, DCH, BW, OS, and CG conceptualized and designed the study. ASRV and SD supported in data collection. DCH, SD, and EZLR conducted preliminary data analysis, and DCH drafted manuscript. All authors reviewed manuscript and supported with edits.

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