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A Comparative Analysis of Human Translation and Machine Translation's Impact on Pedagogy from a Linguistic Perspective

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Abstract: In this rapid growing use of advanced technology, translation industry is going through extensive and profound changes, in order to cater the needs of emerging translation service, more people are likely to use machine to help them translate to increase efficiency. Undoubtedly, translation, which used to be human-oriented, has gone through transformation and upgrading both in its form and content. However, along with its benefits, machine translation also presents certain challenges. One such concern is the lack of cultural sensitivity in the translations it produces. Additionally, as languages continuously evolve with the introduction of new words and expressions, machine translation systems may struggle to keep up, leading to outdated translations. These issues and others necessitate proactive solutions to improve machine translation technology. This paper aims to address these problems by conducting a thorough literature review and performing case analyses from the perspectives of linguistics and pedagogy. This study reveals that translators equipped with the proficiency to leverage machine tools while possessing a comprehensive grasp of diverse translation skills and knowledge can thrive in the future. Similarly, educators can judiciously incorporate machine translation as a supplementary tool in teaching, empowering students to enhance their translation skills and capabilities.

Keywords: Human translation, Machine translation, Linguistics, Pedagogy

1. Introduction

The frequent online interactions during the pandemic suggests that Internet based communication is in urgent need. With the development of globalization, cross-border communication can break the limits of geographic and time issues, which is more efficient and easier to transfer information and resources. With the progress of social economy and technology, people are getting more involved into the use of artificial intelligence. Machine translation, as a trench of translation and a development of artificial intelligence, it has fully adapted to the needs of contemporary service and the basic requirements of the rapidly developing society. With the continuous development of deep learning technology, neural network machine translation (NMT) has gradually replaced rule-based and statistical machine translation technology and become the mainstream technology of machine translation. NMT has great advantages in multi-language translation, semantic understanding and

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structural transformation, and can be trained end-to-end neural networks with the help of large-scale corpora to achieve efficient and accurate translation [1].

The use of artificial intelligence in the field of translation or interpretation is more frequently nowadays than that in the past. Since the Chatgpt and other AI tools came out, there are more translators or interpreters try to use them in practice. Some educators hold contrasting views on the usefulness and appropriateness of student practice involving machine translation in the teaching process. For students, it becomes crucial to discern the acceptability of selected translations in terms of grammar and semantics, necessitating a comprehensive understanding of translation skills. Therefore, this study will conduct an in-depth exploration of students' translation practice through the research methods of literature analysis and case study. This paper aims to conduct a comparative and analytical study of human translation and machine translation in the realm of teaching from a linguistic perspective. The article further presents distinct examples and their respective impacts.

2. Analysis of machine translation and human translation from the perspective of linguistics

2.1. The Positive Influence of Machine Translation

With the development of globalization, cross-border communication has become an important part of daily life and work, and machine translation can conveniently realize the communication between languages. Machine translation can minimize the barriers between different languages, make it more convenient for people in different countries and regions to communicate with each other, and promote communication and understanding between different languages and cultures. it can also help students quickly understand the meaning of another language and provide a basic translation from another language to the target language. These translations provide understanding and perception of different languages. In the process, students learn synonyms, vocabulary, grammar, punctuation and other language knowledge, which is of great help them to improve.

2.2. Negative Effects of Machine Translation

In terms of the disadvantages, when translating different languages, grammar and spelling of the targeted passage are the two aspects that should be considered firstly. Obviously, the translation through machine is without spelling mistakes for most of the cases, but its grammar really needs double check, sometimes the grammar or the structure of a sentence can be confusing. More problems can also be identified from the quality of the text. For example, cultural differences can lead to the misunderstanding of targeted text, the way we express and live will differ according to the language people use as well as the culture we have.When translating between different languages, two critical aspects to consider are the grammar and spelling of the target paragraph. While machine translation is generally proficient in handling spelling, its handling of grammar requires careful scrutiny, as it can sometimes produce confusing sentence structures. Cultural differences can also lead to misunderstandings in the target text, as expressions and lifestyles vary based on language and culture. This issue becomes particularly evident in subtitle translations, where nuances are crucial for conveying the intended meaning accurately.

An example of such a semantic error can be found in the movie "Zootopia," where a line states: "But over time, we evolved, and moved beyond our primitive savage ways." In this context, the meaning is that predators and prey are living in harmony. However, if machine-translated without considering the context, the Chinese translation might convey a completely different message, suggesting that they are still in a state of primitive barbarism. This example highlights the limitations of machines in comprehending the context and setting of a movie, leading to poor quality and inefficient translations [2].

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Machines lack the ability to consider the comprehensive context and cultural subtleties, leading to more side effects in machine translation than commonly perceived. As a result, relying solely on machine translation without human intervention can often yield unsatisfactory results and fail to capture the intended meaning accurately. From a linguistic standpoint, understanding and addressing these limitations is crucial to ensure the quality and effectiveness of machine translation.

Despite these side effects, from the perspective of linguistics, machine translation can minimize the barriers between different languages and help students improve their language skills, the methods people can take is to improve machine translation by deeply understanding the grammar, vocabulary and culture of different languages, improving machine learning algorithms based on relevant knowledge, combining artificial intelligence techniques, and building sustainable machine translation systems. This will be able to better meet the translation needs of different languages and cultural backgrounds, and improve the accuracy and response speed of translation.

3. Analysis of machine translation and human translation from the perspective of pedagogy

3.1. The Positive Influence of Machine Translation on Student

The integration of smart devices, such as smart blackboards, simultaneous interactive microphones, and VR experiments, in modern university classrooms has significantly transformed the learning experience. Machine translation plays a crucial role in this context, enabling students to access information from diverse cultural and language environments, thereby fostering a deeper understanding of different languages and cultures, and expanding their knowledge horizons. This exposure to a wide range of knowledge contributes to a more well-rounded education, allowing students to learn more about the world and its diverse aspects [3].

Moreover, machine translation liberates the labor force by automating the language translation process. This has far-reaching implications for the education industry as it allows teachers and students to redirect their energy towards cultivating innovative thinking, problem-solving abilities, and efficient task completion. With routine language translation tasks delegated to machines, educators and learners can devote more time to critical thinking and creativity, empowering them to explore new ideas and approaches.

By harnessing the power of machine translation and other smart devices, the education sector can usher in a new era of enriched learning experiences. Students can benefit from a broader perspective on global issues, cultural diversity, and cross-linguistic understanding. At the same time, educators can focus on nurturing essential skills and competencies in their students, preparing them for the challenges of the future.

3.2. Negative Effects of Machine Translation

It is noticeable that these smart devices bring very large efficiency, but the side effects it bring have seldomly be taken into consideration.

One significant limitation is the inability of machines to provide personalized education tailored to individual students' needs and backgrounds. Unlike human educators who can understand and adapt to each student's unique requirements, machines lack the capacity to do so. This can result in a standardized and one-size-fits-all approach to education, which might not effectively cater to the diverse learning needs of students. Moreover, overreliance on machines in the teaching process can lead to the erosion of teaching quality. Machines may introduce biases in the academic and cultural aspects of education, hindering the delivery of authentic content to students. Authenticity and cultural sensitivity are crucial in language and translation education, and machines may struggle to capture these nuances accurately. Additionally, unexpected accidents can occur when machines are used

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without proper supervision or double-checking. Teachers who solely rely on machine-generated courseware or translations might face challenges when students ask questions in class. The lack of immediate and accurate answers can hinder students' learning efficiency and undermine the teacher's credibility.

4. Suggestions

4.1. Suggestions for using Machine Translation

Machine translation has shown great potential in bridging language barriers and facilitating cross-cultural communication. However, it still faces challenges in accurately capturing semantic nuances and cultural differences, leading to serious misunderstandings in the translated text. To alleviate these issues, this part proposes a two-fold approach that combines technical improvements and post-editing solutions in MT.

4.1.1. Technical improvements

The primary focus of technical enhancements involves refining algorithms and models to enhance the machine's ability to comprehend context, semantics, and cultural elements. By updating the MT system's database with the latest linguistic knowledge, more intelligent models can be simulated, leading to improved translation accuracy and quality. Particularly, the intricate challenge of dealing with polysemy and synonyms in language is addressed by incorporating fixed phrase matching and linguistic rules into the algorithms. This empowers the machine to interpret and translate such ambiguous phrases based on contextual cues and meaning, thus reducing the potential for semantic misinterpretation.

4.1.2. Post-editing

Post-editing is a way people can use to avoid most of the mistakes that happen in the process of machine translation, post-editing refers to the process of "refining a machine-generated translation with a small number of human modifications." The person who performs post-editing is called a post-editor [4]. This post-editing process ensures the accuracy of the translation and minimizes any misleading ideas resulting from MT-generated content. However, effective post-editing necessitates individuals with profound translation skills and comprehensive linguistic knowledge. As such, aspiring post-editors should undergo specialized training to refine their language expertise, thereby optimizing their ability to rectify and enhance MT outputs.

4.2. Suggestions for Educators

Machine is definitely not the last choice for the teachers to pass their knowledge any efficiently. Human translators have the ability to interpret the meaning of the text and choose the appropriate translation based on the context. Machine translation, on the other hand, may lack the ability to interpret the nuances of a language and thus can never completely replace the human. Machine translation still have large errors and inaccuracy, they still need artificial modification. As educators, it is essential to use translation tools consciously and judiciously.

4.2.1. Translation machine as a teaching tool

Second, machines can be used as tools to assist teachers, not as substitutes. Teachers should guide students to strengthen their understanding and perception of language and culture by reading the

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original text, and at the same time encourage students to manually translate and revise, so as to improve students' translation skills and translation quality.

4.2.2. Translation machines can jointly train students

Some educators have conducted some research on the phenomenon of machine translation, and educators have also assessed the demand for online services in English-Chinese interpreting education. The findings suggest that the use of AI technologies in educational practice could have a significant impact on the development of key competencies for future translators. Using a competency-based approach to interpreter training and taking into account the need to develop the competencies, knowledge and skills required for successful professional translation activities, the authors propose a pedagogical concept for the online educational course "Simultaneous and asynchronous interpretation in a digital environment" [5]. The relationship between machine translation and human translation should be complementary, complementary and mutually assistive, "machine translation + manual compilation" (MT+PE) translation mode will be the development trend of future translation [6]. Therefore, educators need to be aware that with the development of the times, translation machines may undergo more upgrades, and the future may be an era in which artificial intelligence and teachers jointly train students. Teachers also need to improve their knowledge reserves in time to make long-term plans for the development of students.

5. Conclusion

In conclusion, this study reveals that translators equipped with the proficiency to leverage machine tools while possessing a comprehensive grasp of diverse translation skills and knowledge can thrive in the future. Similarly, educators can judiciously incorporate machine translation as a supplementary tool in teaching, empowering students to enhance their translation skills and capabilities. From the perspective of linguistics, the precondition of using machine translation is to become an excellent translator himself, with the ability to identify the errors occur during the process of machine translation. Learning post-editing is undeniably an effective method to preempt mistakes before submitting people’s work.From the perspective of pedagogy, teachers should not encourage students to use machine translation, for most of the students are still in the process of learning, using machine translation is never the shortcut to success. Furthermore, teachers can judiciously incorporate machine translation into their teaching methodologies to improve the efficiency of their instructional practices while also instructing students in the art of post-editing. It is imperative to recognize that machine translation cannot entirely supplant human translation, as traditional human translation may not completely meet the demands of the contemporary landscape. Embracing the future successfully necessitates a unique blend of skills and expertise, wherein translators proficient in leveraging machine tools alongside a comprehensive understanding of diverse translation skills and knowledge will thrive. In the future study, more critical success factors will be identified based on literature review and expert interviews, then the usage rate of machine translation will be investigated through questionnaire survey. The comparative study of different translation mode is going to be conducted, and the lessons learnt from the relationship between humanity and artificial intelligence will be extracted and summarized as well.

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