Exploring the Psychological Impact of Machine Translation on Improving English Vocabulary Proficiency among University Students

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Abstract

In the present era, technology has significantly advanced, making the process of learning English more accessible. Machine Translation (MT) refers to the use of computers to translate documents from one human language to another. The purpose of this study is to investigate how Machine Translation can enhance English vocabulary mastery among university students. The research methodology employed in this study is descriptive qualitative. Vocabulary comprehension is often considered challenging, and many students struggle with it. Learning to master English vocabulary can be difficult due to the complexity of word forms, word choices, and multiple meanings. Google Translate is one example of a program that utilizes multilingual translation processes through online machine translation (MT) methods. The findings indicate that incorporating vocabulary learning strategies in the classroom can enhance university students' vocabulary expansion. Acquiring new vocabulary is crucial for improving language proficiency and advancing to higher competency levels. As a result, researchers are continually exploring the most effective approaches for teaching vocabulary using machine translation.

Keywords: Machine Learning, English Vocabulary Mastery, University Students

Introduction

Due to its widespread study and usage as a first language, second language, and as a foreign language in many nations, English is considered one of the global or world languages. From junior high school to university, Indonesian students are required to take English as their first foreign language. The reason for this is that English serves as the language of science, technology, and business.[1] Vocabulary development is widely acknowledged as being a crucial component in teaching second/foreign languages by scholars, educators, and students of foreign languages. When learning a new language and communicating effectively, words serve as the starting point. A word can begin a communication process and maintain it even when used alone. [2] According to studies, students can understand a question by deriving the meaning from the question's form and consulting additional resources.[3]

According to earlier study, college students choose and employ reading methods that are geared toward succeeding in academic tasks.[4] The most critical thing a teacher can do to assist ESL learners acquire their vocabulary is to encourage them to read a lot.[5] Reading is a challenging skill to acquire when learning a language; in order to comprehend literature or scientific information, one must carefully understand how to read.[6][7] Furthermore, reading involves thinking, assessing, judging, visualizing, logical reasoning, and problem solving. One of the fundamental components for the improvement of learners' linguistic abilities and systems may be their vocabulary. But picking up a lot of terminology is not a simple undertaking. Students are typically obliged to memorize lists of terms from a reading material along with their definitions in the traditional manner, similar to the grammar translation approach. [8]

In the present era, advancements in technology have significantly facilitated the process of learning English.[9] MT, or machine translation refers to the utilization of computers to translate documents from one human language to another. [10]. The history of machine translation (MT), often known as "Online Translator" software (OT), begins in the middle of the 20th century. [11][12] Online machine translation (OMT) tools, which are popular among language learners despite not being specifically created for them, are online

translation services.[13][14] Furthermore, when games, songs, and stories are combined with clear teaching and learning objectives, young students' acquisition of English vocabulary can benefit. The university students enhanced their vocabulary while also learning more about different world cultures through songs and stories about international holidays. Having positive sentiments toward the culture of the target language may well improve motivation to learn a second language, according to the social-psychological approach of motivation.[15]

The objective of this research is to investigate how Machine Translation can contribute to enhancing English vocabulary mastery among university students.

Method

This descriptive qualitative method has been used. Research that is qualitatively descriptive describes data as it is, providing detailed explanations of events or data using explanatory sentences [16]. Qualitative researchers aim to explore phenomena within their natural contexts, seeking to comprehend and interpret these phenomena based on the subjective meanings ascribed to them by individuals involved. [17].

Results

No	Authors	Title	Results
1	[18]	Enhancing English As A Second Language Students' Vocabulary Knowledge	English as a Second Language learners face numerous barriers when it comes to acquiring new vocabulary, with one of the significant challenges being the limited time allocated by teachers for vocabulary instruction. Due to various curricular demands, many elementary school teachers do not prioritize vocabulary instruction as a primary focus. Several studies have revealed a concerning trend where vocabulary instruction constitutes only a minor component of elementary education.
2	[19]	New Trends in Second Language Learning and Teaching through the lens of ICT, Networked Learning, and Artificial Intelligence	The widespread use of cloud-based technology, AI applications, NLP approaches, networked communication, open educational resources, and increased access have had a significant impact on the state of second language teaching today. As was mentioned, this complicated situation poses a number of challenges, including a lack of transparency and privacy concerns related to the mining of student data. However, we must also acknowledge the enormous opportunity these new technologies present for students to take control of their education.
3	[20]	Classifying Multilingual User Feedback using Traditional Machine Learning and Deep Learning	According to research, such feedback often includes useful information for software development teams, such as bug reports or requests for features and assistance. Many researchers and product vendors recommended using automated analyses based on conventional supervised machine learning algorithms because manual analysis of user feedback is laborious and difficult to manage. The findings demonstrate that, even with massive label collection, standard machine learning can still produce outcomes that are on par with deep learning.
4	[21]	Improving homograph disambiguation with	An analysis employing a brand-new, publicly accessible English data set reveals that hybrid systems—using both rules and machine learning—are notably more accurate than either

		supervised machine learning	hand-written rules or machine learning alone. The test also reveals that there is little performance loss when the hybrid system is set up to function on mobile devices with constrained resources rather than on production servers. All US English text-to-speech traffic at Google utilizes the two top algorithms that were just detailed for homograph disambiguation.
5	[22]	Machine Learning-Based Intelligent Scoring System for English Essays under the Background ofModern Information Technology	The lexical semantic properties of English compositions can be extracted more successfully using the semantic representation vector technology that has been developed. English compositions are scored and evaluated using the XGBoost model and the kNN algorithm model, which increases the accuracy of the results. This improves the accuracy and efficiency of the management of the overall scoring model. This indicates that, in terms of evaluation accuracy, the proposed model is superior to the established model. This book offers a fresh approach to using artificial intelligence technology in English instruction against the backdrop of contemporary information technology.
6	[23]	Application of Grammar Error Detection Method for English Composition Based on Machine Learning	The method can free teachers from time-consuming and repetitive evaluation tasks so they have more time and energy for teaching while also saving a lot of time and labor costs associated with manual marking. Additionally, it can give students more rapid and objective feedback, enabling them to understand intuitively and plainly that they are more likely to make grammatical errors as they learn English. It helps and directs English learners in their independent learning in a certain way.

Discussion

Generally, modern civilization depends on lightning-fast internet. People can now contribute to any endeavor, at the very least with their thoughts.[24] Machine learning gained new promise with the development of artificial neural networks.[25] According to the literature, new digital media and technologies have an impact on language learning and teaching, thus teachers must be knowledgeable of the new pedagogies required to ensure efficient use of the technology in the classroom.[26] An earlier study used 60 English-speaking kids to test out Dytective's screening tools and discovered that the feature set was promising, but the study did not completely apply machine learning techniques.[27] For the purpose of identifying English grammatical text entities, a machine learning model based on LSTM-CRF was employed. The outcomes demonstrate that the LSTM-CRF model-based English grammar detection system can streamline the process structure of identification, cut down on wasteful operation cycles, and increase detection accuracy in general.[28]

Machine translation (MT) has become more common in recent years due to the rapid advancement of artificial intelligence.[29] [30]The majority of students find it challenging to understand vocabulary, which is thought of as a hard task. Learning to master English vocabulary can be challenging due to the intricacy of word forms, word selections, and different meanings. Different translation programs, or "apps," have recently been produced, and students are using them as an alternate method of learning English vocabulary. One application that makes use of online machine translation (MT) techniques in multilingual translation procedures is Google Translate.[31][32] Practically all educators are aware that the improper grammar of Google Translate's

translation results precludes its usage as a useful translation tool. Teachers view the use of this application favorably despite its drawbacks. [33] However, since Google Translate provides accurate results whether translating terminology in a single sentence and several paragraphs, the translations produced by this tool are deemed to be quite precise. In the meanwhile, it is claimed to be inaccurate because the translation produced by Google Translate still has a lot of flaws and is not an accurate translation. As a result, the translation results are more appropriately referred to as pre-translations or still require user refinement.[34]

Everyone agrees that vocabulary acquisition is an essential component of teaching second/foreign languages, including academics, researchers, and language learners. To learn and communicate effectively in a foreign language, one must start with words. Even when employed alone, a word can initiate and maintain a communication process.[2] By writing in English and improving their language comprehension, English language learners can raise their proficiency level. By grading students' English compositions and recognizing shortcomings in their own education and instruction, English instructors gain insight into the learning environments of their students.[35][36]

Since vocabulary is seen as the foundation connecting the four language abilities together, obtaining an adequate vocabulary encourages understandable communication. It could be difficult to learn new vocabulary when learning English as a foreign language (EFL). To encourage students' vocabulary growth, vocabulary learning techniques should be used in the classroom.[37] More than 100 languages are supported by Google's Neural Machine Translation (gnmt), which has been in use since 2016. Google Version 5.9.0 was used to perform translations for the current investigation. With the text-to-speech function of this program, students can hear the output read out in English while also receiving electronic translations. In addition, the program includes a back-translation capability that lets users see how well the original language was translated into English.[38] The BLEU score between the translations of the original inputs and the translations of the perturbed inputs, according to Cheng et al., is only 79.01 and 69.74% of the translations have changed, indicating that NMT models are extremely sensitive to modest perturbations in the input.[39]

Learning new vocabulary is essential for improving one's command of the target language and advancing to proficiency levels. So, in order to teach vocabulary, researchers are constantly looking for the ideal method. The four groups of cognitive, metacognitive, emotional, and social learning techniques for English are listed on the one hand.[40]

Conclusion

With the rapid advancement of artificial intelligence, MT has gained significant popularity in recent years. Vocabulary comprehension is often considered a challenging topic, and many students struggle with it. Learning English vocabulary can be difficult due to the complexity of word forms, word choices, and multiple meanings. Google Translate is one notable program that utilizes multilingual translation processes through online MT methodologies. Consequently, it can be inferred that implementing vocabulary learning strategies in the classroom is crucial for enhancing university students' vocabulary expansion. Acquiring new vocabulary is essential for improving language proficiency and achieving higher competency levels. As a result, researchers are continuously seeking the most effective approach to teaching vocabulary through the use of machine translation.

References

[1]   D. Anggraheni, A. Anandha, and H. L. T. S, "Enhancing English Vocabulary Using Clt Method Toward Slb D Students Via Zoom Application As Interactive Learning Media," *ETERNAL (English Teach. Journal)*, vol. 11, no. 2, pp. 10–21, 2020, doi: 10.26877/eternal.v11i2.7559.

[2]   L. Ismail Omar, "The Use and Abuse of Machine Translation in Vocabulary Acquisition among L2 Arabic-Speaking Learners," *Arab World English J. Transl. Lit. Stud.*, vol. 5, no. 1, pp. 82–98, 2021, doi: 10.24093/awejtls/vol5no1.6.

[3]   K. Saigh and N. Chmitt, "Difficulties with vocabulary word form: The case of Arabic ESL learners.,"

System, vol. 40, no. 1, 2012, [Online]. Available: https://doi.org/10.1016/j.system.2012.01.005.

[4] F. Cubukcu, "Enhancing vocabulary development and reading comprehension through metacognitive strategies," *Issues Educ. Res.*, vol. 18, no. 1, pp. 1–11, 2008.

[5] A. E. Cunningham and K. E. Stanovich, *What reading does for the mind.* American Educator (Spring/Summer), 1998.

[6] D. Saputra, "Exploring the Utilization of Machine Translation As a Language Learning Tool in EFL Classroom," University of Makassar, 2017.

[7] Worther, *Guide Reading (First ed.). New York Harper Collin,.* College Publiser, 1993.

[8] W. R. Bin-hady, "The Role of Games in Enhancing EFL Students' Vocabulary Acquisition," *Fac. Educ. Sci. J.*, no. September 2020, pp. 59–68, 2021.

[9] S. R. M. Zulkifli, "A Qualitative Study: The Use of Google Translate among English Education Department Students," 2019. [Online]. Available: http://www.scopus.com/inward/record.url?eid=2-s2.0-84865607390&partnerID=tZOtx3y1%0Ahttp://books.google.com/books?hl=en&lr=&id=2LI MMD9FVXkC&oi=fnd&pg=PR5&dq=Principles+of+Digital+Image+Processing+funda mental+techniques&ots=HjrHeuS_

[10] W. Hutchins and H. Somers, *An introduction to machine translation*. London: Academic Press, 1992.

[11] A. Akbari, "An overall perspective of machine translation with shortcomings," *Int. J. Educ. Lit. Stud.*, vol. 2, no. 1, pp. 1–10, 2014, doi: 10.7575/aiac.ijels.v.2n.1p.1.

[12] T. Poibeau, *Machine Translation.* Cambridge, Massachusetts: Massachusetts Institute of Technology, 2017.

[13] M. Ata and E. Debreli, "Machine translation in the language classroom: Turkish efl learners' and instructors' perceptions and use," *IAFOR J. Educ.*, vol. 9, no. 4, pp. 103–122, 2021, doi: 10.22492/ije.9.4.06.

[14] J. Benda, "Google Translate in the EFL classroom taboo or teaching tool?.," *Writ. Pedagog.*, vol. 5, no. 2, pp. 317–332., 2014.

[15] M. hsuan Chou, "Assessing English vocabulary and enhancing young English as a Foreign Language (EFL) learners' motivation through games, songs, and stories," *Educ. 3-13*, vol. 42, no. 3, pp. 284–297, 2014, doi: 10.1080/03004279.2012.680899.

[16] L. J. Moleong, *Metodologi Penelitian Kualitatif*. Bandung: PT. Remaja Rosdakarya, 2012.

[17] J. W. Creswell and J. W. Creswell, *Qualitative inquiry & research design: Choosing among five approaches*, 2nd ed. Sage Publications., 1998.

[18] D. Brassell and L. Furtado, "ENHANCING ENGLISH AS A SECOND LANGUAGE STUDENTS' VOCABULARY KNOWLEDGE," *Read. Matrix*, vol. 8, no. 1, pp. 112–116, 2008.

[19] J. Kannan and P. Munday, "New trends in second language learning and teaching through the lens of ICT, networked learning, and artificial intelligence," *Circ. Linguist. Apl. a la Comun.*, vol. 76, pp. 13–30, 2018, doi: 10.5209/CLAC.62495.

[20] C. Stanik, M. Haering, and W. Maalej, "Classifying multilingual user feedback using traditional machine learning and deep learning," *Proc. - 2019 IEEE 27th Int. Requir. Eng. Conf. Work. REW 2019*, pp. 220–226, 2019, doi: 10.1109/REW.2019.00046.

[21] K. Gorman, G. Mazovetskiy, and V. Nikolaev, "Improving homograph disambiguation with supervised machine learning," *Lr. 2018 - 11th Int. Conf. Lang. Resour. Eval.*, pp. 1349–1352, 2019.

[22] S. Fu and H. Chen, "Machine Learning-Based Intelligent Scoring System for English Essays under the Background of Modern Information Technology," *Comput. Intell. Neurosci.*, vol. 2022, 2022, doi: 10.1155/2022/6912018.

[23] H. He and D. Maia, "Application of Grammar Error Detection Method for English Composition Based on Machine Learning," *Secur. Commun. Networks*, vol. 2022, 2022, doi: 10.1155/2022/7957365.

[24] M. I. Siddiqi Emon, S. S. Ahmed, S. A. Milu, and S. S. Mahtab, "Sentiment Analysis of Bengali Online

Reviews written with English Letter Using Machine Learning Approaches," *ACM Int. Conf. Proceeding Ser.*, pp. 109–115, 2019, doi: 10.1145/3362966.3362977.

[25]   F. Jiao, J. Song, X. Zhao, P. Zhao, and R. wang, "A Spoken English Teaching System Based on Speech Recognition and Machine Learning," *Int. J. Emerg. Technol. Learn.*, vol. 16, no. 4, pp. 68–82, 2021, doi: 10.3991/ijet.v16i14.24049.

[26]   M. K. Kabilan and T. Z. M. E. Zahar, "Enhancing students' vocabulary knowledge using the Facebook environment," *Indones. J. Appl. Linguist.*, vol. 5, no. 2, pp. 217–230, 2016, doi: 10.17509/ijal.v5i2.1346.

[27]   L. Rello *et al.*, "Screening dyslexia for english using HCI measures and machine learning," *ACM Int. Conf. Proceeding Ser.*, vol. 2018-April, pp. 80–84, 2018, doi: 10.1145/3194658.3194675.

[28]   L. Wu and M. Pan, "English Grammar Detection Based on LSTM-CRF Machine Learning Model," *Comput. Intell. Neurosci.*, vol. 2021, 2021, doi: 10.1155/2021/8545686.

[29]   X. Deng, "A Systematic Review of Machine-Translation-Assisted Language Learning for Sustainable Education," 2022.

[30]   P. Grajzl and P. Murrell, "A machine-learning history of English caselaw and legal ideas prior to the Industrial Revolution II: Applications," *J. Institutional Econ.*, vol. 17, no. 2, pp. 201–216, 2021, doi: 10.1017/S1744137420000363.

[31]   T. F. Kai and T. K. Hua, "Enhancing english language vocabulary learning among indigenous learners through google translate," *J. Educ. e-Learning Res.*, vol. 8, no. 2, pp. 143–148, 2021, doi: 10.20448/JOURNAL.509.2021.82.143.148.

[32]   F. Oktaviana, "A naturalistic study: English instruction at English course in Kampung Inggris.," *Loquen English Stud. Journal,* vol. 11, no. 1, pp. 40–62, 2018.

[33]   A. Z. Andari, "the Teachers' Perception Towards the Use of Google Translate As a Translation Tool," vol. 3, no. 170705113, p. 88, 2021.

[34]   S. T. M. N. Lawa, C. P. Ate, and V. P. Kefa, "Penggunaan Google Translate Sebagai Alternatif Media Penerjemah Pada Abstrak Jurnal Mahasiswa," *Hinef*, vol. 1, no. 1, pp. 86–93, 2022.

[35]   S. M. Lee, "The impact of using machine translation on EFL students' writing," *Comput. Assist. Lang. Learn.*, vol. 33, no. 3, pp. 157–175, 2020.

[36]   P. Parikh, K. Velhal, S. Potdar, A. Sikligar, and R. Karani, "English Language Accent Classification and Conversion using Machine Learning," *SSRN Electron. J.*, pp. 1–5, 2020, doi: 10.2139/ssrn.3600748.

[37]   M. Salavati and H. Salehi, "Impact of using instructional video games on EFL learners' vocabulary retention.," *Univers. J. Educ. Res.*, vol. 4, no. 12, p. http://doi.org/10.13189/ujer.2016.041205, 2016, [Online]. Available: http://doi.org/10.13189/ujer.2016.041205

[38]   N. Briggs, "Neural machine translation tools in the language learning classroom: Students' use, perceptions, and analyses," *JALT CALL J.*, vol. 14, no. 1, pp. 3–24, 2018, doi: 10.29140/jaltcall.v14n1.221.

[39]   Y. Cheng, Z. Tu, F. Meng, J. Zhai, and Y. Liu, "Towards robust neural machine translation," *ACL 2018 - 56th Annu. Meet. Assoc. Comput. Linguist. Proc. Conf. (Long Pap.*, vol. 1, pp. 1756–1766, 2018, doi: 10.18653/v1/p18-1163.

[40]   Z. Chen, "Language learning strategies based on the educational concept of innovation and entrepreneurship," *Open Access Libr. J.*, vol. 3, no. 1, pp. 1–6, 2016.