



Teachers' Perceptions of Integrating ChatGPT in Nepalese Classrooms

Milan Acharya

milanpanga123@gmail.com

ORCID : 0000-0002-0686-9431

Assistant Lecturer, Sanothimi Campus, TU

Samjhana Bansyat

Lecturer, Sanothimi Campus, TU

ORCID : 0009-0009-1328-2717

Keywords

ChatGPT, pedagogy, qualitative research, classroom interaction

Abstract

This article explores teachers' perceptions of integrating ChatGPT in Nepalese classrooms. Using a qualitative research design, the study examines the viewpoints and experiences of teacher participants to gain an understanding of context, meanings, and subjective perspectives using ChatGPT. In-depth interviews were conducted with five teacher educators and five school teachers, capturing insights from both university and school classroom environments. Purposive sampling ensured the deliberate selection of participants from the Faculty of Education, Tribhuvan University and schools in the Kirtipur municipality. The data analysis involves transcription, translation, coding, decoding, and the creation of themes, sub-themes, and categories, enabling an exploration of the study's issues. The study found that teachers perceive ChatGPT as a useful tool for deepening classroom instruction, particularly in providing personalized learning experiences. However, concerns were raised regarding the potential over-reliance on the technology, emphasizing the need for proper training and guidelines to ensure its effective integration in Nepalese educational settings. This study contributes valuable insights for educators and teachers interested in integrating ChatGPT into educational settings, with the ultimate goal of informing the development of strategies for the effective use of this technology in Nepalese classrooms.

Introduction

A novel tool that could transform a wide scope is introduced by the most recent advancement in artificial intelligence (AI). This AI tool enables human-like interactions and problem-solving by utilizing cutting-edge machine-learning programs and natural language processing capabilities. This technology is particularly good at activities like content generation, language translation, and user support because it can understand and produce writing that is similar to that of a human (Chen, 2023; Mandal et al., 2020). Its flexibility and adaptability make it a valuable tool for a wide range of applications, including content creation platforms, instructional tools, and virtual assistants. The AI tool offers creative solutions and increased efficiency in a variety of disciplines.

In Nepal, the use of ChatGPT is expanding quickly, which is indicative of the teachers' growing interest in and use of AI technologies. Spread throughout several industries, such as schools and colleges education, and online platforms, ChatGPT is revolutionizing the way Nepalese students interact with their target content (Devkota et al., 2022; Pandey, 2023). Because of its adaptability in comprehending and producing natural language, it is a favorite tool for language processing and content development. The rapidly expanding presence of ChatGPT in Nepal's digital landscape highlights the technology's positive impact on efficiency and innovation, as more institutions understand its potential to streamline operations and enhance students' experiences. To completely transform education, schools in Nepal are progressively implementing and utilizing internet resources through information and communication technology (ICT). This move toward digital integration is improving methods of instruction and learning by

teachers and students' access to cutting-edge tools and resources (Acharya, 2024; Garg & Sharma, 2020). The use of ICT to assist the adoption of online tools makes learning more dynamic and interesting. To expand access to high-quality education and get around geographical limitations, schools in Nepal are using AI, digital content and educational apps to virtual classrooms and e-learning platforms. This shift not only creates a technologically advanced learning environment but also gives students the fundamental digital skills they need to meet the challenges of the twenty-first century. The educational environment in Nepal is changing as schools continue to use these internet resources.

There are benefits and drawbacks to using ChatGPT. Positively, ChatGPT can be a useful tool for improving streamlining communication and automating several tasks that will boost productivity. It is helpful for language-related applications because of its capacity to comprehend and produce text that is similar to that of a human, allowing for more natural interactions. Personalized learning experiences can also be supported in educational environments by utilizing ChatGPT (Adiguzel et al., 2023; Firat, 2023; Limo et al., 2023). On the other hand, though, issues with ethics come up, including the possibility of being abused to disseminate false information, prejudiced reactions, and security defects. Furthermore, ChatGPT's lack of true awareness (Chomsky et al., 2023) and comprehension may reduce its dependability while making crucial decisions. Striking a balance between harnessing the benefits of ChatGPT and addressing its limitations is essential to ensure responsible netizens.

In the context of Nepalese classroom teaching and learning, the integration of ChatGPT offers both opportunities and challenges.

On the positive side, ChatGPT can enhance classroom instruction by streamlining communication between teachers and students, automating routine tasks, and providing personalized learning experiences. AI's ability to generate human-like text can make learning more interactive and engaging. However, the drawbacks must also be considered; the potential for misinformation, biased responses, and security concerns requires careful management. Additionally, ChatGPT's lack of true understanding may limit its reliability in critical educational decisions. Therefore, while ChatGPT can be a valuable tool in the classroom, teachers need to balance its use with a focus on critical thinking, ethical considerations, and the development of responsible digital citizens.

ChatGPT is a cutting-edge language model built on the GPT-3.5 architecture. This sophisticated natural language processing model is well known for its capacity to comprehend and produce text that is cohesive and human-like, enabling it to have lively and pertinent discussions. Based on learning principles, ChatGPT leverages large datasets for text comprehension and generation across a range of applications, from educational tools to virtual assistants. As demonstrated by the work of Brown et al., (2020) in the original GPT-3 study, the architecture's efficacy in capturing context and producing contextually relevant responses has been investigated in literature, demonstrating its potential applicability across a variety of areas. Notwithstanding its potential, the literature's discussions highlight ethical issues and problems with bias, transparency, and responsible use. These issues depicting the larger conversation about the use of AI language models in language applications.

Students utilize ChatGPT because of its many applications in natural language processing across several domains. The demand for sophisticated conversational AI, virtual help, content production (Anantrasirichai & Bull, 2022), and instructional support is driving its activity. The research highlights the model's efficacy in comprehending context and producing coherent text, making it a potent tool for human-like interactions. This is especially true of Brown et al.'s (2020) work on GPT-3. ChatGPT is attractive because it can automate language comprehension activities and streamline customer service, translation, and information retrieval procedures. Furthermore, the scalability and generalization capabilities of the model are highlighted by research conducted by Rabinstein et al., (2021), which adds to its extensive application in a variety of areas. Despite the wide range of applications, talks about potential biases and ethical issues are brought up in the literature, which emphasizes the necessity for responsible deployment (Brown et al., 2020).

The use of ChatGPT in the classroom has become popular as a cutting-edge strategy to improve learning outcomes. By utilizing its natural language processing skills, ChatGPT can offer individualized tutoring, respond to questions from students, and create interactive learning environments. The capacity of the GPT-3 model to provide contextually appropriate responses is highlighted (Brown et al., 2020), which makes it an invaluable tool in educational contexts where dynamic and adaptable interactions. ChatGPT can meet each student's unique learning needs by creating instructional content and providing virtual support, which will increase student s engagement and comprehension. Furthermore, Jeon and Lee (2023) work shows how ChatGPT can help with language learning and offer immediate feedback.

Although there is potential for ChatGPT to be used in education, it is important to address ethical issues including bias and data privacy (Brown et al., 2020; Goel & Joyner, 2017; Ng et al., 2023; Popenici & Kerr, 2017).

Using ChatGPT's natural language processing features to improve student engagement, offer individualized help, and facilitate interactive learning experiences is an effective way to use the platform in the classroom. The literature highlights the model's flexibility and few-shot learning capabilities, which makes it appropriate for handling a range of student inquiries and supporting content creation. Teachers can use ChatGPT as a virtual assistant to meet each student's unique learning needs by providing immediate feedback, responding to inquiries, and providing more explanations. Additionally, Jia et al., (2021) highlights the model's potential to facilitate language acquisition, which may be used to develop educational resources tailored to a particular language. To guarantee the responsible implementation of ChatGPT in educational contexts, it is imperative to take ethical factors like transparency and prejudice mitigation into account (Brown et al., 2020; Garg & Sharma, 2020; Jeon & Lee, 2023; Rabinstein et al., 2021).

One complex issue that needs to be taken into account is how ChatGPT affects teachers' and students' creativity. Although the model can provide useful assistance and inspiration for writing, there are worries that it may inhibit creative thought. The literature, and UNESCO's (2019) emphasis on the debates about AI's role in education, in particular, stresses the need to strike a balance between integrating technology and encouraging creativity and critical thinking. While ChatGPT can be helpful for some areas, relying too much on automatic answers

could unintentionally hinder the growth of independent thought and original problem-solving techniques. Teachers must be cautious when incorporating technology into lesson planning, making sure that ChatGPT usage enhances rather than takes the place of chances for students to share their original thoughts. A comprehensive and successful educational strategy must strike a balance between the advantages of AI help and a persistent focus on nurturing creativity (Beck et al., 1996; UNESCO, 2019).

Research shows ChatGPT can be useful for content creation, virtual tutoring, and tailored learning (Hu, 2021; Jeon & Lee, 2023). ChatGPT is necessary for its appropriateness in educational settings (Brown et al., 2020; UNESCO, 2019). While ChatGPT can be a useful tool for producing information, responding to inquiries, and promoting interactive learning, its use should be consistent with the objectives and principles of education. The UNESCO (2019) study emphasizes the significance of preserving a human-centric approach to education, with technology acting as an adjunct rather than a substitute for interpersonal communication and creative expression. The body of literature advocates for a nuanced strategy in which educators guide students to use ChatGPT as a learning tool and support system rather than as a magic bullet (Stadelmann et al., 2021; UNESCO, 2019). This strategy takes advantage of ChatGPT's efficiency and accessibility benefits while adhering to the educational ideals of promoting critical thinking, problem-solving, and creative expression (Brown et al., 2020; Holstein et al., 2018; Pokrivcakova, 2019).

The use of ChatGPT in Nepalese classrooms is essential for delivering personalized learning experiences, enabling teachers to address

each student's unique needs and learning pace effectively. It also provides access to a vast display of educational resources and information, helping to overcome limitations in traditional teaching materials and supporting both teachers and students in resource-constrained environments. Additionally, integrating ChatGPT fosters digital literacy and critical thinking skills among students, preparing them for the technological demands of the future workforce and promoting responsible use of advanced technologies. The use of ChatGPT in the schools in Nepal is becoming more and more popular. Effective integration requires an understanding of the interactions between ChatGPT's capabilities and educational methods. The literature on AI in education highlights the need for context-specific research to address the particular opportunities and challenges that arise when implementing it. There is still more research to be done on the usefulness, moral implications, and general efficacy of ChatGPT in Nepalese institutions. This study aims to explore the effectiveness and implications of integrating ChatGPT into Nepalese classrooms, with a focus on personalized learning experiences, resource accessibility, and the development of digital literacy and critical thinking skills among students. It also highlighted how the use of ChatGPT impacts personalized learning experiences by catering to students' unique needs and learning paces. Additionally, it investigated the challenges and opportunities associated with integrating ChatGPT in resource-constrained educational environments in Nepal.

Methodology

This study explored the viewpoints and experiences of teachers. For this, five university teacher educators and five school teachers were interviewed in-depth to acquire qualitative data. It captured insights ensuring

varied views. This technique is used to deliberately choose participants according to predetermined standards that are pertinent to the study's objectives. About half an hour interview were taken from each respondent. It is recorded and stored before the preparation of the transcription. The thematic (Clarke & Braun, 2017) and verbatim analysis is done focussing on transcription, translation, coding, decoding, and the creation of themes, sub-themes, and categories. Both the analytical techniques used in this study aid in a thorough analysis of the qualitative data, making sure that significant discoveries and recurring themes are emphasized. Before conducting interviews, participants' oral consent is obtained to resolve ethical concerns. This entails outlining the study's objectives, participation being voluntary, and the confidentiality of the data exchanged in detail. we took the consent is essential for maintaining ethical norms, honoring participant autonomy, and making sure that participants are fully informed and freely participating in the study.

Findings

The study's findings highlighted the platform's ability as a teaching and learning by the use of AI-generated tools. It is found that *ChatGPT has proven to be quite beneficial in providing students with instant responses to their queries. One of the teachers said offering an extra resource for idea clarification and learning material reinforcement, ChatGPT enhances conventional teaching approaches. "ChatGPT has been particularly useful in language classes for enhancing vocabulary and language skills,"* said another teacher (T2). A more dynamic and immersive language learning experience is enhanced by the opportunity for students to participate in interactive conversations and receive immediate feedback. It is also found that

teacher educators have recognized a few issues and problems related to using ChatGPT in classroom environments.

A teacher educator said, "*ChatGPT is helpful in some areas of education, but use caution while using it*". Students gain from having personal contact with their teachers, and ChatGPT should be viewed as an additional resource rather than a replacement for that interaction. Concerning potential biases in ChatGPT comments, another teacher (T3) said:

"We need to be cautious of the content provided by ChatGPT since it can unintentionally preserve biases. To guarantee a fair and inclusive learning environment, it is essential to evaluate and contextualize the information offered."

These findings highlight the benefits of using ChatGPT for teaching and learning as well as the difficulties that teachers face. The results of in-depth interviews with university teachers about the use of ChatGPT revealed a range of viewpoints on the applicability of the technology. "*ChatGPT has proven to be an invaluable tool for promoting student engagement in lectures and discussions,*"(UT1). Because of its interactive features, students may engage in dialogue, ask questions, and seek clarifications, creating a more dynamic learning environment. "*ChatGPT helps students generate ideas and refine research questions in research-oriented courses,*" (UT2). It can help by offering excess information, freeing up time for more critical analysis and synthesis.

Nonetheless, issues arose throughout the interviews, with a few teacher educators stressing the necessity of giving ChatGPT integration considerable thought. "*While*

ChatGPT is a helpful tool, there is a risk of overreliance," (T4). It's imperative that students learn how to think critically and not rely only on knowledge produced by AI. In order to help students navigate and critically assess the material produced by ChatGPT, teachers play a significant role. One of the school teacher (T5) said:

We need to be aware of any biases in the results produced by ChatGPT. When using technology in school education, it is crucial to make sure that the content complies with academic norms and to encourage moral usage.

These findings provide a significant knowledge of school teachers' views on ChatGPT application, recognizing the technology's advantages as well as the significance of its proper integration into higher education.

Concerns about possible ChatGPT misuse by teacher educators rose from the findings of in-depth conversations. According to a teacher educator, there's a discernible pattern where students use ChatGPT to look up ready-made solutions and then copy and paste them into their assignments. This compromises the goal of assignments, which is to evaluate students' comprehension and critical thinking abilities, and presents a serious threat to academic integrity. Teacher educator (UT5) said:

"even at the MPhil level, we've observed instances where students are heavily relying on ChatGPT to generate entire sections of their assignments. This raises ethical questions concerning the academic rigor of the assessment process in addition to undermining the legitimacy of their work.

“The participants emphasized the necessity of raising awareness and taking preventative action to deal with students’ misuse of ChatGPT. We need to educate students about the ethical use of technology in academia”, (UT3). The value of independent thought, critical analysis, and appropriate citation techniques must be emphasized. It is not in accordance with academic integrity norms to just copy information from ChatGPT without understanding. As an educator, ziy id needed to adapt assessment strategies to detect and discourage misuse,”(UT1). This might imply giving tasks that are less likely to be produced by AI technologies more thoughtful and customized components. These findings highlight the increasing difficulty of abuse when students utilize ChatGPT for homework, highlighting the significance of resolving this issue by means of a mix of instructional programs and thoughtful evaluation design.

Discussion

The findings shed light on the several functions that ChatGPT plays positive and negative role in education. The increased interest in incorporating AI technology into educational contexts is in line with the beneficial contributions of ChatGPT as a flexible tool for educational support, especially in terms of improving language skills and clarifying concepts (Brown et al., 2020). ChatGPT’s capacity to deliver prompt responses and facilitate interactive dialogues between students and teachers has the potential to revolutionize conventional teaching approaches and produce dynamic, immersive learning environments.

Teachers’ positive feelings on the use of AI are in line with literature that emphasizes the advantages of ChatGPT in education. Brown et al., (2020) demonstrate how versatile AI tools in education. The use of ChatGPT

promotes language learning is consistent with Jeon and Lee (2023), which highlights the function of AI in assisting language acquisition through instantaneous feedback. Significant difficulties and factors to take into account when integrating ChatGPT in educational environment. Teachers’ caution about abandoning the human element in education is in line with UNESCO’s (2019), emphasis on preserving a human-centric approach to education.

Literature (Brown et al., 2020; UNESCO, 2019) highlights the need for responsible preparation, transparency, and accountability in AI technologies. The teachers’ demand for contextualization and critical evaluation of the data produced by ChatGPT are in line with larger debates over the moral application of AI in education. Moving on to the university context, the many viewpoints of ChatGPT’s usefulness in higher education demonstrates how flexible it is in various learning environments. The literature’s examination of AI as a tool for improving higher education experiences aligns with the facilitation of student involvement and assistance in lectures and research-oriented courses (Brown et al., 2020; Chen, 2023; Garg & Sharma, 2020; Rabinstein et al., 2021). The focus on helping university students develop their critical thinking abilities and the role that educators play in assisting them is in line with the larger conversations around AI literacy and responsible usage of AI (UNESCO, 2019).

Academic integrity is seriously threatened by the conversations concerning possible ChatGPT abuse by students. The trend of students using ChatGPT to create content for assignments is consistent with larger conversations about the threats AI tools bring to academic integrity (Mandal et al., 2020). The recommendations for resolving

the ethical concerns associated with AI technologies in education are in line with the emphasis on teaching students about the ethical use of technology and modifying assessment methodologies (UNESCO, 2019). The results, taken together, demonstrate the dual character of ChatGPT's influence on education while presenting worthwhile potential for innovation and support, they also pose moral and practical issues. To ensure the responsible and successful integration of ChatGPT in a variety of educational settings, addressing these issues is a must.

The study's conclusions provide insight into how teachers view incorporating ChatGPT into the classroom and the methods they use to implement successful pedagogy. The favorable opinions shared by teacher educators at universities and school teachers are consistent with the increasing amount of research examining the possible advantages of incorporating AI like ChatGPT into learning settings. Brown et al., (2020) highlight how AI tool can be used in a variety of contexts, including education. Teachers' positive comments about ChatGPT's ability to respond quickly and create interactive learning opportunities align with research highlighting how AI may improve student support and engagement in the classroom (Baidoo-Anu & Ansah, 2023; Grassini, 2023). To fully realize the potential of AI technology in education, more study and development in this area are necessary, as these positive perceptions highlight.

Considering the results that point to both possible advantages and difficulties in integrating ChatGPT in educational institutions, it is imperative that suggestions be made on its proper application. First and foremost, the Nepalese education authorities must to think about creating thorough

standards for the integration of ChatGPT in learning environments. The secondary facet of ChatGPT as an instructional help should be emphasized in these guidelines, encouraging educators to use it as a resource for clarification, extra explanations, and language improvement. In addition, the guidelines must to emphasize how crucial it is to preserve the human-centered nature of education and how teachers play a critical role in developing positive relationships with their students. In order to provide a fair and inclusive learning environment and relieve worries about biases, the guidelines should advise teachers to evaluate and contextualize the data that ChatGPT provides.

The Nepal government must to intervene proactively in light of the possibility of misuse, especially with regard to academic integrity. It is advised that in order to identify any cases of plagiarism enabled by ChatGPT, the government implement an AI-powered similarity index checking system for student work. This can entail working with specialists in educational technology to create and execute plagiarism detection programs that take into account content produced by AI models. The government may preserve the integrity of the educational system by putting such procedures into place and making sure that student assessments fairly represent their comprehension and independent. Additionally, educational institutions ought to teach students on the responsible use of ChatGPT while highlighting the significance of critical thinking, academic integrity, and independent work. This strategy contributes to a responsible and successful integration of technology in Nepalese education by taking a proactive approach to addressing potential issues and utilizing the benefits of AI in the classroom.

Conclusion and Implication

The integration of ChatGPT in Nepalese educational institutions offers both promising advantages and notable challenges. While the technology can enhance learning by providing additional support in clarifying concepts, offering extra explanations, and improving language skills, it also raises concerns about the preservation of the human-centered nature of education and the potential for misuse, particularly regarding academic integrity. The successful incorporation of ChatGPT in education requires carefully crafted guidelines that balance the benefits of AI with the essential role of teachers in fostering meaningful student-teacher relationships. By addressing these concerns and establishing a structured approach, the educational system in Nepal can harness the potential of ChatGPT while safeguarding the integrity and quality of education.

Given the dual potential for both positive and negative impacts, educational authorities must take a proactive role in shaping the integration of ChatGPT in schools and university classrooms. Developing comprehensive guidelines that emphasize the supportive role of ChatGPT while maintaining the centrality of the teacher-student relationship is crucial. Moreover, implementing an AI-powered plagiarism detection system and educating students on the responsible use of AI tools are essential steps to prevent misuse and ensure that academic assessments accurately reflect students' understanding and independent efforts. By doing so, the educational system can effectively navigate the challenges posed by AI while maximizing its benefits, ultimately contributing to a more robust and equitable learning environment in Nepal.

References

- Acharya, K. P. (2024). Science Teachers' Professional Development at Tribhuvan University: Bridging the Policy-Implementation Gap. *ILAM इलाम*, 20(1), 40-59.
- Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionizing education with AI: Exploring the transformative potential of ChatGPT. *Contemporary Educational Technology*, 15(3), <https://doi.org/10.30935/cedtech/13152>
- Anantrasirichai, N., & Bull, D. (2022). Artificial intelligence in the creative industries: a review. *Artificial intelligence review*, 1-68. <https://doi.org/10.1007/s10462-021-10039-7>
- Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, 7(1), 52-62. <https://doi.org/10.2139/ssrn.4337484>
- Beck, J., Stern, M., & Haugsjaa, E. (1996). Applications of AI in Education. *XRDS: Crossroads, The ACM Magazine for Students*, 3(1), 11-15. <https://doi.org/10.1145/332148.332153>
- Brown, T., Mann, B., Ryder, N., Subbiah, M., Kaplan, J. D., Dhariwal, P., ... & Amodei, D. (2020). Language models are few-shot learners. *Advances in neural information processing systems*, 33, 1877-1901.
- Chen, T. J. (2023). ChatGPT and other artificial intelligence applications speed up scientific writing. *Journal of the*

- Chinese Medical Association, 86(4), 351-353. <https://doi.org/10.1097/JCMA.0000000000000900>
- Chomsky, N., Roberts, I., & Watumull, J. (2023). Noam Chomsky: The False Promise of ChatGPT. *The New York Times*, 8.
- Clarke, V., & Braun, V. (2017). Thematic analysis. *The journal of positive psychology*, 12(3), 297-298.
- Devkota, N., Paudel, R., Parajuli, S., Paudel, U. R., & Bhandari, U. (2022). Artificial Intelligence Adoption Among Nepalese Industries: Industrial Readiness, Challenges, and Way Forward. In *Handbook of Research on Artificial Intelligence in Government Practices and Processes* (pp. 210-225). IGI Global. <https://doi.org/10.4018/978-1-7998-9609-8.ch012>
- Firat, M. (2023). How chat GPT can transform autodidactic experiences and open education. *Department of Distance Education, Open Education Faculty, Anadolu Unive.* <https://doi.org/10.31219/osf.io/9ge8m>
- Garg, S., & Sharma, S. (2020). Impact of artificial intelligence in special need education to promote inclusive pedagogy. *International Journal of Information and Education Technology*, 10(7), 523-527. <https://doi.org/10.18178/ijiet.2020.10.7.1418>
- Goel, A. K., & Joyner, D. A. (2017). Using AI to teach AI: lessons from an online AI class. *Ai Magazine*, 38(2), 48-59. <https://doi.org/10.1609/aimag.v38i2.2732>
- Grassini, S. (2023). Shaping the future of education: exploring the potential and consequences of AI and ChatGPT in educational settings. *Education Sciences*, 13(7), 692. <https://doi.org/10.3390/educsci13070692>
- Holstein, K., McLaren, B. M., & Aleven, V. (2018). Student learning benefits of a mixed-reality teacher awareness tool in AI-enhanced classrooms. In *Artificial Intelligence in Education: 19th International Conference, AIED 2018, London, UK, June 27–30, 2018, Proceedings, Part I 19* (pp. 154-168). Springer International Publishing. https://doi.org/10.1007/978-3-319-93843-1_12
- Hu, J. (2021). Teaching evaluation system by use of machine learning and artificial intelligence methods. *International Journal of Emerging Technologies in Learning (iJET)*, 16(5), 87-101. <https://doi.org/10.3991/ijet.v16i05.20299>
- Jeon, J., & Lee, S. (2023). Large language models in education: A focus on the complementary relationship between human teachers and ChatGPT. *Education and Information Technologies*, 1-20. <https://doi.org/10.1007/s10639-023-11834-1>
- Jia, C., Yang, Y., Xia, Y., Chen, Y. T., Parekh, Z., Pham, H., ... & Duerig, T. (2021, July). Scaling up visual and vision-language representation learning with noisy text supervision. In *International conference on machine learning* (pp. 4904-4916). PMLR.
- Limo, F. A. F., Tiza, D. R. H., Roque, M. M., Herrera, E. E., Murillo, J. P. M., Huallpa, J. J., ... & Gonzáles, J. L. A. (2023). Personalized tutoring: ChatGPT as a virtual tutor for personalized learning

- experiences. *Social Space*, 23(1), 293-312.
- Mandal, K., Ghantasala, G. P., Khan, F., Sathiyaraj, R., & Balamurugan, B. (2020). Futurity of Translation Algorithms for Neural Machine Translation (NMT) and Its Vision. In *Natural Language Processing in Artificial Intelligence* (pp. 53-95). Apple Academic Press. <https://doi.org/10.1201/9780367808495-3>
- Ng, D. T. K., Lee, M., Tan, R. J. Y., Hu, X., Downie, J. S., & Chu, S. K. W. (2023). A review of AI teaching and learning from 2000 to 2020. *Education and Information Technologies*, 28(7), 8445-8501. <https://doi.org/10.1007/s10639-022-11491-w>
- Pandey, D. L., Risal, N., & Basnet, B. J. (2023). Enhancing Productivity: Artificial Intelligence's Effect on Productivity of Nepalese Large-Scale Organizations. *Asian Journal of Economics, Business and Accounting*, 23(24), 47-57. <https://doi.org/10.9734/ajeba/2023/v23i241186>
- Pokrivcakova, S. (2019). Preparing teachers for the application of AI-powered technologies in foreign language education. *Journal of Language and Cultural Education*, 7(3), 135-153. <https://doi.org/10.2478/jolace-2019-0025>
- Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, 12(1), 1-13. <https://doi.org/10.2478/jolace-2019-0025>
- Rabinstein, A. A., Yost, M. D., Faust, L., Kashou, A. H., Latif, O. S., Graff-Radford, J., ... & Friedman, P. A. (2021). Artificial intelligence-enabled ECG to identify silent atrial fibrillation in embolic stroke of unknown source. *Journal of Stroke and Cerebrovascular Diseases*, 30(9), 105998. <https://doi.org/10.1186/s41039-017-0062-8>
- Stadelmann, T., Keuzenkamp, J., Grabner, H., & Würsch, C. (2021). The AI-atlas: didactics for teaching AI and machine learning on-site, online, and hybrid. *Education Sciences*, 11(7), 318. <https://doi.org/10.1080/17439884.2015.1012523>
- UNESCO (2019). Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000367412>.