

Conversational Agents to Support Education with Emphasis on Accessibility: A Systematic Literature Review

Caroline de Souza Evangelista¹, Francisco Petrônio Alencar de Medeiros¹

¹ Programa de Pós-Graduação em Tecnologia da Informação
Instituto Federal da Paraíba (IFPB)
João Pessoa – PB – Brasil

caroline.evangelista@academico.ifpb.edu.br, petronio@ifpb.edu.br

Abstract. *Conversational agents are increasingly used in education, but accessibility is still less explored. This paper presents a systematic literature review of studies published between 2015 and 2025. From 301 identified studies, 53 were selected. The results show a predominance of chatbot-based solutions (96.2%), while voice-based agents appear in only 1.9% of the studies. One study (1.9%) combined chatbot and voicebot interaction. Most works focus on teaching, learning, and academic support, while inclusion is less frequent. The findings indicate limited attention to accessibility, especially in voice interfaces, multimodal resources, and evaluations with people with disabilities.*

Resumo. *Agentes conversacionais são cada vez mais usados na educação, mas a acessibilidade ainda é pouco explorada. Este trabalho apresenta uma revisão sistemática da literatura com estudos publicados entre 2015 e 2025. Dos 301 estudos identificados, 53 foram selecionados. Os resultados mostram predominância de soluções baseadas em chatbots (96,2%), enquanto agentes baseados em voz aparecem em apenas 1,9% dos estudos. Um estudo (1,9%) combinou interação por chatbot e voicebot. A maioria dos trabalhos foca ensino, aprendizagem e suporte acadêmico, enquanto a inclusão é menos frequente. Os achados indicam atenção limitada à acessibilidade, principalmente em interfaces por voz, recursos multimodais e avaliações com pessoas com deficiência.*

1. Introduction

The use of conversational agents has increased in recent years, especially with the advance of artificial intelligence and with the popularization of LLMs (Large Language Models), such as ChatGPT and Gemini. In education, these systems have been used to support teaching, academic support, tutoring, and interaction with students, being applied in different teaching and learning activities [Kuhail et al. 2023, Debets et al. 2025]. After the COVID-19 pandemic, this discussion became even more relevant, since universities needed to move many activities to emergency remote teaching. In this period, tools such as Moodle, Google Classroom, and video call tools became part of the routine of many institutions, mainly to share materials, carry out activities, and maintain academic continuity [Iglesias-Pradas et al. 2021, Lima and Isotani 2022].

Even with these advances, there are still gaps when these solutions are observed from the accessibility point of view. In many cases, virtual learning environments and digital academic services are built without considering users with disabilities. This can make access to materials more difficult, create problems in navigation, and add barriers to the educational experience [Calvo et al. 2014, dos Santos et al. 2021]. Although tools such as screen readers help convert text and images into speech, this alone does not guarantee that the experience will be accessible. Studies on accessibility in virtual learning environments show that barriers may also be related to interface structure, content organization, navigation, and the way users interact with the system [Calvo et al. 2014, dos Santos et al. 2021].

Previous reviews have already analyzed the use of chatbots in education, but most of them focus on pedagogical objectives, technologies used, evaluation methods, or impacts on teaching and learning. There is still little discussion about how these agents are studied from the point of view of accessibility, especially when considering voice interfaces and the participation of people with disabilities in the evaluations. Because of this, this review brings together studies on chatbots and voicebots in educational contexts, also observing applications related to inclusion, barriers reported, and methodological limitations of the selected studies.

Considering this, the present paper aims to analyze how conversational agents have been used in education, with emphasis on accessibility, identifying patterns, limitations, and research opportunities. The main contribution of this study is to bring together evidence on the use of chatbots and voicebots in educational contexts, describing the distribution of applications, the types of technology used, the results presented, the limitations observed, the metrics employed, and the presence of studies focused on the inclusion of people with disabilities.

2. Related Works

The literature already has reviews and mapping studies about the use of conversational agents in education. [Kuhail et al. 2023], for example, analyzed educational chatbots considering points such as learning domains, interaction styles, technologies, and evaluation methods. [Debets et al. 2025] also discuss chatbots in educational contexts, showing educational uses and the way these systems are evaluated. These works are important because they show that conversational agents have become a relevant research topic in education, especially for tutoring, feedback, and student support.

However, these reviews usually discuss accessibility as a secondary aspect, when it is mentioned. At the same time, studies about accessibility in virtual learning environments show that access barriers are not limited to the availability of digital content, but also involve navigation, interface organization, interaction mechanisms, and support for different user profiles [Calvo et al. 2014, dos Santos et al. 2021]. This indicates that there is still a gap between studies on educational conversational agents and studies on accessibility in digital education.

Even though previous reviews provide important information about educational chatbots, they usually focus on pedagogical effectiveness, technological architectures, or user acceptance. Different from this, this review investigates aspects related to accessibility, including barriers faced by people with disabilities, the use of voice interfaces,

multimodal interaction mechanisms, and the participation of people with disabilities in the evaluations. Also, the review covers studies published until 2025, presenting an updated view of recent advances and research gaps that still exist.

This review differs from previous works because it focuses specifically on the intersection between conversational agents, education, and accessibility. In addition, it considers both chatbot and voicebot based solutions. The analysis also considers whether the studies report accessibility barriers, include people with disabilities in the evaluation, and present metrics to evaluate the proposed systems.

3. Methodology

This systematic literature review used a protocol defined before the execution of the searches. The purpose of the protocol was to organize the process and make the selection and data extraction stages clearer. The objective of this review was to map studies published between 2015 and 2025 about the use, results, and limitations of chatbots and voicebots in educational institutions. The review considered both educational and academic administrative applications, and also studies related to accessibility and inclusion of people with disabilities.

To guide this analysis, six research questions were defined: (RQ1) What is the main objective of the analyzed studies? (RQ2) What results are presented in the studies? (RQ3) What limitations are found? (RQ4) When a real chatbot or voicebot is implemented, which model or platform was used? (RQ5) In studies focused on accessibility, what usage barriers were found for people with disabilities? (RQ6) In which educational context was the study applied? User acceptance and performance indicators were also extracted as complementary data, but they were not kept as independent research questions because of space limits.

The search string was created from the main terms related to the review objective. The terms were organized around three groups: conversational agents, educational context, and accessibility. The search was carried out in ACM Digital Library, IEEE Xplore, Scopus, and SBC OpenLib, because these databases are relevant to Computing and Informatics in Education. The string was adapted to the search mechanism of each database, but the same general structure presented in Table 1 was kept.

Table 1. General search string

("voicebot" OR "voice assistant" OR "speech-based agent" OR "conversational agent" OR chatbot) AND (education OR university OR school OR college OR institute) AND (learning OR teaching OR tutoring OR "student support") AND (accessibility OR disability OR disabled OR "special needs" OR assistive)
--

The studies found in the databases were organized in Parsifal, which was used to register the inclusion and exclusion decisions. The selection process was carried out in stages. First, duplicate studies were removed. After that, titles and abstracts were read and, when this information was not enough to make a decision, the full text was consulted. The following types of studies were excluded: (i) incomplete papers, such as abstracts, presentations, or partial reports; (ii) papers published in languages other than English or Portuguese; (iii) studies published before 2015; (iv) papers without access to the full text; (v) studies that did not address chatbots or voicebots in the educational context; (vi) only conceptual papers, without application or practical contribution; (vii) duplicate studies,

keeping only the most complete version; and (viii) papers in which the conversational behavior was handled directly by a ready-made LLM, without a described NLP/NLU architecture, intent identification, or dialogue flow.

After the selection, each included study was read and the data extraction spreadsheet was filled in. This spreadsheet included information such as author, year, publication venue, database, study objective, results, limitations, type of technology, platform used, accessibility barriers, educational context, level of education, target audience, country or study location, user evaluation, acceptance or perception evaluation, and reported metrics.

The educational context categories were defined based on the reading of the studies and were refined during data extraction. When a study had more than one purpose, the main purpose was considered. In some cases, a combined category was used, such as academic and administrative support or teaching/learning with inclusion. This organization allowed to group the studies according to the research questions and to identify common patterns in the analyzed literature.

4. Results

The searches in the selected databases returned 301 studies. Of these, 94 studies were found from ACM Digital Library, 25 from IEEE Xplore, 35 from SBC OpenLib (SOL), and 147 from Scopus. After removing 33 duplicate records, 268 studies remained for screening. At the end of the selection process, 53 studies were selected to be analyzed. Table 2 presents the initial and final numbers by database.

Table 2. Initial and selected studies by database

Database	Initial studies	Selected studies	Share of selected studies
ACM Digital Library	94	12	22.6%
IEEE Xplore	25	4	7.5%
SBC OpenLib	35	14	26.4%
Scopus	147	23	43.4%
Total	301	53	100.0%

Figure 1 presents the study selection flow and helps to show where the main reduction of studies happened. The removal of duplicates reduced the initial set from 301 to 268 studies, which indicates that most records found in the databases were unique. The largest reduction occurred after the screening and application of the inclusion and exclusion criteria, when the number of studies went from 268 to 53. This shows that the search string was broad enough to retrieve many studies related to conversational agents, education, and accessibility, but only a smaller group was actually aligned with the objective of this review.

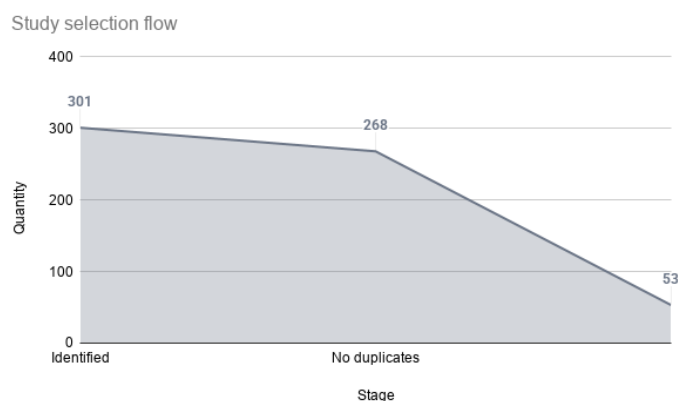


Figure 1. Study selection flow

The exclusion reasons presented in Table 3 show that most papers were removed because they were not aligned with the objective of this review. The main reason was the absence of relation with educational chatbots or voicebots, representing 47.4% of the exclusions. Another frequent reason was the presence of only conceptual works, without practical application or contribution, representing 27.9% of the exclusions. This indicates that, although the search string found many studies related to conversational agents, several of them were not directly connected to the educational context or did not present an implemented solution. The exclusion of studies in which the conversational behavior was handled directly by pre-built LLMs also helped to separate general use of generative AI tools from studies that described an NLP/NLU architecture, intent identification, or dialogue flow.

Table 3. Main reasons for excluding studies

Exclusion reason	Studies	Percentage
Studies that did not address chatbots or voicebots in an educational context	102	47.4%
Purely conceptual works, without practical application or contribution	60	27.9%
Articles that are not complete, such as abstracts, presentations, or partial reports	27	12.6%
Projects in which the conversational behavior was handled directly by a ready-made LLM, without a described NLP/NLU architecture or intent identification	24	11.2%
Works without access to the full text	2	0.9%
Total	215	100.0%

Regarding the type of technology, 51 studies (96.2%) used chatbots, 1 (1.9%) used a voicebot, and 1 (1.9%) combined both approaches. This distribution shows a higher number of text-based agents, even in a review that also considered voice-based interaction. Regarding the educational context, the studies are mainly concentrated in teaching/learning and academic support, while inclusion appears less frequently, as shown in Figure 2.

Higher Education was the most frequent level of education, with 26 studies

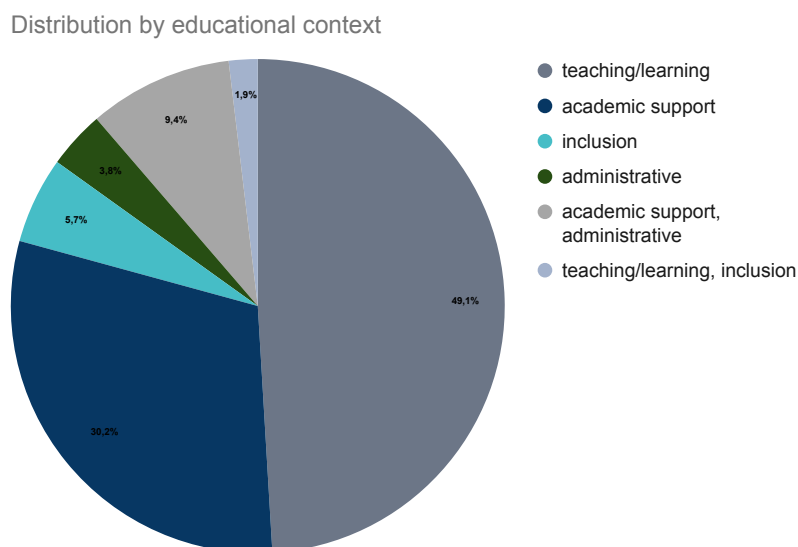


Figure 2. Distribution by educational context

(49.1%). Students were the main target audience in 22 studies (41.5%). Brazil was the most frequent country, with 15 studies (28.3%), followed by India, with 6 studies (11.3%). These data indicate that most analyzed applications are still concentrated in formal education contexts, especially in Higher Education. The number of Brazilian studies may also be related to the search strategy, since the search strings were applied in both English and Portuguese, allowing studies published in Brazilian venues to be retrieved more easily.

5. Analysis of the Research Questions

This section presents the extracted results according to the six research questions kept in the final protocol. The analysis relates the categories found in the spreadsheet to examples from the selected studies.

5.1. RQ1. What is the main objective of the analyzed studies?

Most studies use conversational agents to support teaching, learning, or academic support. In the teaching and learning group, the agent usually acts as a tutor, practice partner, or learning companion. Examples include Smart Teacher for Grade 10 ICT students [Jathushan et al. 2022], Complex World for English learning [Montanher et al. 2021], Professora Vitoria for reading support [Bulhoses et al. 2020], K-Qbot for learning the Kazakh Latin alphabet [Oralbayeva et al. 2022], and works focused on software testing, self-learning challenges, and higher order thinking skills [Paschoal et al. 2019, Pessoa et al. 2021, Gu 2025]. In the academic support group, the objective is usually to improve access to institutional information, as in VardhaGenie [Gayathri et al. 2024], the virtual assistant for federal institutions [Sabaini et al. 2020], the academic conversational agent for dynamic information retrieval [Cruz et al. 2020], and FIT-EBot [Hien et al. 2018].

Only a small number of studies have accessibility or inclusion as their central objective. This group includes platforms for students with visual or hearing impairments [Gayathri et al. 2025], a chatbot for people with intellectual disabilities [Mateos-Sanchez et al. 2022], an embodied conversational agent in immersive virtual reality for children with autism [Alvarado et al. 2023], and a chatbot integrated with video

prompting for students with intellectual disabilities [Wu 2024]. This result indicates that accessibility is still less frequent as a direct research objective.

5.2. RQ2. What results are presented in the studies?

The results presented in the studies show contributions related to access to information, student engagement, perceived usefulness, and support for learning activities. In teaching and learning, Complex World reported gains in motivation and post-test performance [Montanher et al. 2021], K-Qbot reported improvement in the number of letters learned after the use of the system [Oralbayeva et al. 2022], and the chatbot assisted learning model for higher order thinking skills reported improvements in problem solving, critical thinking, creative thinking, and cooperation [Gu 2025]. In academic support, the assistant for federal institutions reported that 87.2% of students would use the bot again and that 97.4% evaluated ease of use, answer quality, and language simplicity as very good or excellent [Sabaini et al. 2020]. The dynamic information retrieval agent reached a SUS score of 89 [Cruz et al. 2020], and the distance education support study reported reductions in the number of support tickets after chatbot adoption [Bittencourt et al. 2024].

The results related to accessibility are positive, but still limited. Engineering for All reported more than 90% accuracy for chatbot responses and high accuracy for sign language recognition and multimodal conversion [Gayathri et al. 2025]. The multimodal mathematics platform reported difficulties in representing mathematical content for students with visual impairments [Jariwala et al. 2021]. The chatbot for people with intellectual disabilities reported positive feedback in alpha and beta tests, but also showed the need to consider communication and cognitive accessibility during the design of the solution [Mateos-Sanchez et al. 2022].

5.3. RQ3. What limitations are found?

The main technical limitations involve natural language understanding, dependence on structured knowledge bases, answers outside the expected scope, and the need for constant update of the content. These problems appear in systems for both learning and institutional support, such as the software testing education chatbot [Paschoal et al. 2019], FIT-EBot [Hien et al. 2018], and the assistant for federal institutions [Sabaini et al. 2020]. In systems with voice or multimodal interaction, limitations also involve recognition quality and environment conditions. Smart Teacher reported dependence on the quality of image and voice input [Jathushan et al. 2022], while RamiBot and the bilingual chatbot reported difficulties with noisy environments and speech recognition [Yong et al. 2023, Das et al. 2025].

Methodological limitations are also frequent. Several studies evaluate prototypes with small samples, short use periods, or no real users. The dynamic information retrieval agent used only five participants [Cruz et al. 2020], the ADA Blocks feasibility study included 13 teachers [Perin et al. 2022], and Smart Teacher did not present an evaluation with real users [Jathushan et al. 2022]. This makes the evidence weaker, especially for accessibility claims.

5.4. RQ4. When a real chatbot or voicebot is implemented, which model or platform was used?

The results show a higher number of chatbot-based solutions, representing 96.2% of the analyzed studies. The implementation strategies are different. Some stud-

ies used commercial or well known tools, such as Dialogflow in Complex World [Montanher et al. 2021], the virtual assistant for federal institutions [Sabaini et al. 2020], and FIT-EBot [Hien et al. 2018]. Other studies used Rasa or custom NLP pipelines, such as Smart Teacher [Jathushan et al. 2022] and the Greek academic chatbot [Nikologiannis et al. 2024]. There are also solutions based on Microsoft Power Virtual Agents [Custódio and Damasceno 2023], Telegram [Oralbayeva et al. 2022], Discord with Python [Pessoa et al. 2021], Amazon Lex and Twilio [Kavyashree et al. 2024], and retrieval or RAG architectures [Bordin et al. 2025].

Voice-based agents are less frequent. Only one study was classified exclusively as a voicebot, while RamiBot combined chatbot and voicebot features using Google Speech to Text and pyttsx3 [Yong et al. 2023]. This indicates that voice interfaces may be positive, but they still require more technical validation and evaluation with users.

5.5. RQ5. In studies focused on accessibility, what usage barriers were found for people with disabilities?

The small number of studies classified as inclusion (5.7%) or teaching/learning with inclusion (1.9%) shows that accessibility barriers remain underexplored. Among the barriers found, ADA Blocks found limited accessibility for people with low vision or blindness [Perin et al. 2022]. The multimodal mathematics platform found difficulties in the interpretation of mathematical formulas by screen readers and limitations in accessible mathematical materials [Jariwala et al. 2021]. The chatbot for people with intellectual disabilities reported barriers related to communication, cognitive accessibility, and sensory accessibility [Mateos-Sanchez et al. 2022]. Voice- or audio-based studies also reported barriers related to noise and speech recognition quality [Yong et al. 2023, Das et al. 2025].

These results indicate that a conversational interface does not by itself make a system accessible. A chatbot can still create barriers if the interface is not compatible with assistive technologies, if the language is not clear, or if users with disabilities are not included in the validation process. Voice interaction can reduce typing or visual navigation barriers, but it can introduce problems related to recognition errors, privacy, accent differences, and environmental noise.

5.6. RQ6. In which educational context was the study applied?

The studies are mainly concentrated in teaching and learning contexts, with 26 studies (49.1%), and academic support, with 16 studies (30.2%). Teaching and learning applications include language learning [Montanher et al. 2021, Oralbayeva et al. 2022], reading support [Bulhoes et al. 2020], nursing education [Custódio and Damasceno 2023], software testing education [Paschoal et al. 2019], self-learning through logical and mathematical computational challenges [Pessoa et al. 2021], and 3D animation design [Gu 2025]. Academic support applications focus on answering questions, retrieving information from institutional documents, or supporting administrative routines, as in VardhaGenie [Gayathri et al. 2024], the assistant for federal institutions [Sabaini et al. 2020], UniChat [Bordin et al. 2025], and FIT-EBot [Hien et al. 2018].

Studies focused on inclusion are fewer and more specific. They include support for students with visual and hearing impairments [Gayathri et al. 2025], people with intellectual disabilities [Mateos-Sanchez et al. 2022], children with autism

[Alvarado et al. 2023], and solving mathematical problems for students with intellectual disabilities [Wu 2024]. This distribution suggests that accessibility is not yet a common concern in most educational conversational agent studies.

6. Discussion and Limitations

The results show that conversational agents have been more explored in educational contexts, mainly to support teaching, learning, and academic support. Most of the analyzed studies use chatbots to answer questions, provide feedback, support learning activities, or facilitate access to institutional information. This result indicates that conversational agents are already seen as useful tools in education, especially when the objective is to provide fast and direct interaction with students.

However, the analysis also shows that accessibility is still not treated as a main concern in most studies. Although chatbots and voicebots are often presented as tools that can simplify access to information, few studies evaluate whether these systems really reduce barriers for people with disabilities. In many cases, the conversational agent is described as an accessible or inclusive solution, but the evaluation does not include users with disabilities or does not discuss accessibility criteria in detail.

This is an important limitation because a conversational interface is not by itself accessible. A chatbot may reduce the need to navigate complex menus, but it can still create barriers if the language is not clear, if the interface is not compatible with assistive technologies, or if users with disabilities are not considered during design and testing. In the same way, voice-based agents may help users who face difficulties with reading, typing, or visual navigation, but they also introduce problems related to speech recognition errors, environmental noise, privacy, and accent differences.

The small number of voice-based and multimodal solutions also suggests an important gap. While text-based chatbots are more common in the analyzed literature, voice and multimodal agents may be more suitable in some accessibility scenarios. For example, voice interaction can support users with visual impairments or motor difficulties, while multimodal resources can combine text, audio, images, and sign language recognition to support different user profiles. Even so, the analyzed literature still presents few studies that explore these possibilities in more detail.

Another point found in the selected studies is the diversity of evaluation methods and metrics. Some studies report accuracy, precision, recall, F1-score, response time, SUS, satisfaction, task success, interaction logs, or qualitative feedback, while others present only general perceptions or do not evaluate the system with real users. This difference makes comparison difficult and shows the need for clearer evaluation protocols, especially for studies that claim accessibility or inclusion benefits. Technical performance alone does not guarantee that the system improves the educational experience or reduces barriers for different groups of users.

This review also has some limitations. The search was conducted in four digital libraries that are relevant to Computing and Informatics in Education, but relevant studies indexed in other databases may not have been found. In addition, although the search string included terms related to conversational agents, education, and accessibility, some studies may have used different terminology and because of this, may not have appeared

in the search results. The classification of objectives, educational contexts, accessibility aspects, results, and limitations also involved interpretation during data extraction. To reduce this problem, the extraction was guided by predefined research questions and categories.

Finally, the analysis also depends on the information reported in the selected studies. In some cases, the studies did not provide detailed information about participants, evaluation procedures, accessibility barriers, or performance indicators. This limited how deep the analysis could be of the synthesis and shows the need for future studies to describe more clearly how conversational agents are evaluated, who participates in the evaluation, and which criteria are used to assess accessibility and inclusion.

7. Conclusion

This systematic literature review analyzed how conversational agents have been used in educational contexts, with emphasis on accessibility. From 301 initially found studies, 53 were selected and analyzed. The results show that most studies focus on chatbots and on teaching/learning or academic support, while voice-based, multimodal, and inclusion-focused approaches are still less frequent.

The review also showed that many studies do not clearly report accessibility barriers or do not evaluate their systems with people with disabilities. Because of this, there is a need for more systematic evaluations with clear accessibility criteria, participation of the target audience, and metrics that consider both technical performance and barrier reduction in real educational contexts.

This review contributes to the understanding of how conversational agents have been adopted in educational environments and shows the limited attention given to accessibility-related issues. The results show opportunities for future research involving multimodal interaction, voice-based educational assistants, accessibility-centered evaluation protocols, and greater participation of people with disabilities during the design and validation process. These directions can contribute to the development of more inclusive educational technologies able to support different student profiles.

Declaration on the Use of Artificial Intelligence

The authors declare that generative artificial intelligence tools were used to support the drafting and revision of this paper. The authors reviewed, edited, and are fully responsible for all content presented in this paper, including the accuracy of the information, citations, analyses, and conclusions.

References

- Alvarado, Y., Guerrero, R., and Serón, F. (2023). Inclusive learning through immersive virtual reality and semantic embodied conversational agent: A case study in children with autism. *Journal of Computer Science and Technology*, 23(2):e09–e09.
- Bittencourt, J., Simão, J. P., Maria, S. A., Ferreira, V. C., and Koen, G. (2024). Chatbots na educação a distância: um estudo de caso no suporte ao cursista. In *Workshop de Educação a Distância e Ensino Híbrido (WEADEH)*, pages 39–48. SBC.

- Bordin, A. C. B., Lunardi, G. M., Piveta, E. K., and Emmendorfer, L. (2025). Unichat: Arquitetura e avaliação de um agente rag de baixo custo para o contexto universitário. In *Simpósio Brasileiro de Banco de Dados (SBBD)*, pages 886–892. SBC.
- Bulhoes, D. B., Assis, L. P., Bodolay, A. N., Andrade, A. V., and Pitangui, C. G. (2020). Professora vitória: um chatbot para o ensino da leitura. In *Simpósio Brasileiro de Informática na Educação (SBIE)*, pages 451–460. SBC.
- Calvo, R., Iglesias, A., and Moreno, L. (2014). Accessibility barriers for users of screen readers in the moodle learning content management system. *Universal access in the information society*, 13(3):315–327.
- Cruz, J. A. d., Nasser, M., Tuler, E., Carvalho, D., Rocha, L., and Viana, M. (2020). Creating an academic conversational agent for dynamic information retrieval. In *Proceedings of the XVI Brazilian Symposium on Information Systems*, pages 1–8.
- Custódio, C. C. and Damasceno, E. F. (2023). Avaliação de um sistema de chatbot no ensino de enfermagem. In *Simpósio Brasileiro de Informática na Educação (SBIE)*, pages 521–535. SBC.
- Das, S., Sreeja, K., Keerthi, N., and Shriya, D. S. (2025). Intelligent bilingual chatbot for enhanced user engagement on college websites. In *2025 3rd International Conference on Disruptive Technologies (ICDT)*, pages 939–944. IEEE.
- Debets, T., Banihashem, S. K., Joosten-Ten Brinke, D., Vos, T. E., de Buy Wenniger, G. M., and Camp, G. (2025). Chatbots in education: A systematic review of objectives, underlying technology and theory, evaluation criteria, and impacts. *Computers & Education*, 234:105323.
- dos Santos, C. E. R., de Oliveira, L. P., Herrera, V. A. S., and da Silva, S. (2021). Acessibilidade digital em ambientes virtuais de aprendizagem: Uma revisão sistemática. *EAD em Foco*, 11(1).
- Gayathri, B., Kumar, G. S., Prashanth, T., and Kumar, B. M. (2024). Vardhagenie: Advancing student support through ai. In *2024 International Conference on Smart Systems for applications in Electrical Sciences (ICSSES)*, pages 1–6. IEEE.
- Gayathri, R., Roy, S. J., et al. (2025). Engineering for all: Empowering students with visual and hearing impairments through inclusive learning. In *2025 3rd International Conference on Artificial Intelligence and Machine Learning Applications Theme: Healthcare and Internet of Things (AIMLA)*, pages 1–6. IEEE.
- Gu, Y. (2025). The impact of chatbot-assisted learning model on higher-order thinking skills (hots) in a 3d animation design course. In *Proceedings of the 2025 2nd International Conference on Informatics Education and Computer Technology Applications*, pages 122–127.
- Hien, H. T., Cuong, P.-N., Nam, L. N. H., Nhung, H. L. T. K., and Thang, L. D. (2018). Intelligent assistants in higher-education environments: the fit-ebot, a chatbot for administrative and learning support. In *Proceedings of the 9th international symposium on information and communication technology*, pages 69–76.
- Iglesias-Pradas, S., Hernández-García, Á., Chaparro-Peláez, J., and Prieto, J. L. (2021). Emergency remote teaching and students’ academic performance in higher educa-

- tion during the covid-19 pandemic: A case study. *Computers in human behavior*, 119:106713.
- Jariwala, A., Marghitu, D., and Chapman, R. (2021). A multimodal platform to teach mathematics to students with vision-impairment. In *International Conference on Human-Computer Interaction*, pages 109–117. Springer.
- Jathushan, V., Senthujan, B., Ajiharan, B., Kasthury, M., Gamage, A., and Ganegoda, D. (2022). Smart teacher-an ai-based self-learning platform for grade 10 ict students. In *2022 IEEE 7th International conference for Convergence in Technology (I2CT)*, pages 1–5. IEEE.
- Kavyashree, M., Anupama, S., Keerthana, B., Krishnagiri, K., NS, S., and HU, S. (2024). Streamlining college enquiries: Integrating amazon lex and twilio for whatsapp chatbot accessibility. In *2024 OITS International Conference on Information Technology (OCIT)*, pages 409–413. IEEE.
- Kuhail, M. A., Alturki, N., Alramlawi, S., and Alhejori, K. (2023). Interacting with educational chatbots: A systematic review. *Education and Information Technologies*, 28(1):973–1018.
- Lima, D. A. and Isotani, S. (2022). Guidelines for google classroom usage as an e-learning tool during covid-19 pandemic based on similarity search. In *Simpósio Brasileiro de Informática na Educação (SBIE)*, pages 289–300. SBC.
- Mateos-Sanchez, M., Melo, A. C., Blanco, L. S., and García, A. M. F. (2022). Chatbot, as educational and inclusive tool for people with intellectual disabilities. *Sustainability*, 14(3):1520.
- Montanher, R. C., Zadi, I. C., and Monteiro, A. M. (2021). Complex world: um jogo para auxiliar o aprendizado de inglês como segunda língua utilizando a abordagem pedagógica do pensamento complexo. In *Simpósio Brasileiro de Informática na Educação (SBIE)*, pages 417–428. SBC.
- Nikologiannis, O., Tsampos, I., and Marakakis, E. (2024). An intelligent chatbot in greek using machine learning technology. In *Proceedings of the 28th Pan-Hellenic Conference on Progress in Computing and Informatics*, pages 57–62.
- Oralbayeva, N., Shakerimov, A., Sarmonov, S., Kantoreyeva, K., Dadebayeva, F., Serkali, N., and Sandygulova, A. (2022). K-qbot: Language learning chatbot based on reinforcement learning. In *2022 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pages 963–967. IEEE.
- Paschoal, L. N., Turci, L. F., Conte, T. U., and Souza, S. R. (2019). Towards a conversational agent to support the software testing education. In *Proceedings of the XXXIII Brazilian Symposium on Software Engineering*, pages 57–66.
- Perin, A. P. J., Silva, D. E. d. S., and Valentim, N. M. C. (2022). Um estudo de viabilidade sobre a assistente virtual ada blocks com professores do ensino médio. In *Simpósio Brasileiro de Informática na Educação (SBIE)*, pages 1243–1254. SBC.
- Pessoa, L., Martins, L., Martins, G., Guimaraes, V., and de Freitas, R. (2021). Um storybot como apoio a processos de autoaprendizagem através de desafios lógicos

matemático-computacionais e valorização cultural. In *Simpósio Brasileiro de Informática na Educação (SBIE)*, pages 1320–1329. SBC.

Sabaini, P., Clemente, B., and Coutinho, B. (2020). Proposta de assistente virtual inteligente para estudantes das instituições federais de ensino profissional. In *Encontro Nacional de Computação dos Institutos Federais (ENCompIF)*, pages 61–68. SBC.

Wu, C.-L. (2024). Using a chatbot integrated with video prompting to enhance mathematical word problem-solving skills in primary school students with intellectual disabilities. In *International Conference on Computers Helping People with Special Needs*, pages 203–210. Springer.

Yong, E. D., De Jesus, L. C. M., Abordo, M. J. R., Co, M. J., Derige, D. F., and Perez, D. J. M. (2023). Chatbot and voicebot feature for ramibot using deep learning sequential model for intent classification. In *2023 IEEE 15th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment, and Management (HNICEM)*, pages 1–5. IEEE.