A Historical Analysis and Pedagogical Implications of Artificial Intelligence and Chatbots

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***Abstract*— The field of Artificial Intelligence (AI) possesses a substantial historical background, tracing its origins to the year 1956 when the term was first introduced at Dartmouth College to development of Chatbots. Despite encountering initial obstacles and facing financial difficulties, the field of AI witnessed a renewed interest and progress in the 1980s. This comeback was further propelled by significant improvements in the 21st century, primarily attributed to the development of machine learning techniques and the availability of vast amounts of data sometimes referred to as big data. Within the realm of education, AI possesses the capacity to revolutionise the processes of teaching and learning by providing individualised support, improving communication channels, and streamlining research endeavours. Nonetheless, apprehensions regarding the displacement of jobs continue to be a prevailing issue. This study was based on a review and analysis of existing literature, examines the historical progression of AI and its potential implications within the realm of education, offering personalized learning experiences, interactive instruction, and efficiency gains. It highlights the classification of Chatbots and their diverse applications in education, from administrative support to fostering motivation, communication skills, and even language acquisition. The study investigates both the benefits and drawbacks of Chatbots in education, addressing issues of personal contact, privacy, and potential over-reliance on AI systems. The paper also discusses the impact of Chatbots on teachers, such as generating support materials, assessments, and serving as a research tool. It highlights the need for teachers to nurture critical thinking, interpretation skills, and emotional support, ensuring responsible usage of AI technology. Policymakers and educators should embrace these technologies judiciously and guide their integration into the educational landscape, recognizing the transformative potential while preserving the essence of human engagement and mentorship.**

Keywords—Artificial Intelligence, Chatbots, Pedagogical Implication, Historical analysis

I. INTRODUCTION

The field of Artificial Intelligence (AI) has undergone substantial advancements during its development, employing a profound influence on several aspects of human society. This study explores the historical progression of AI specifically to Chatbots, its integration into the field of education, and its capacity to transform pedagogical methodologies. Although AI exhibits great potential in the field of education, it also gives rise to apprehensions regarding the possibility of job displacement. This study investigates the historical trajectory of AI from its emergence during the 1950s to its subsequent revival in the 21st century, with a specific focus on its utilisation within the field of education.

A. The historical development of Artificial Intelligence (AI)

Artificial Intelligence (AI) is a rapidly expanding field of technology with the potential to significantly impact several facets of human social interactions. AI has emerged as a significant development in the field of education, with its potential to generate innovative teaching and learning approaches [1, 2]. These novel solutions are currently being evaluated in many educational settings. According to [2], the concept of intelligence can be described as the capacity to effectively retain, retrieve, and employ information. There are others who also perceive the advancement of AI as a potential threat to the well-being of humanity. There is a prevailing viewpoint among many individuals that the advent of AI, in contrast to prior technological advancements, poses a significant threat of widespread unemployment [3, 4]. This statement suggests that the aim of creating computers with human-like intellectual capabilities, including reasoning, meaning discovery, generalisation, and learning from past experiences, involves the incorporation of artificial intelligence.

The formal establishment of the area of AI may be traced back to the year 1956. This significant milestone occurred during an academic conference held at Dartmouth College in Hanover, New Hampshire, where the phrase "artificial intelligence" was first coined by [3]. Over time, it became evident that they had significantly underestimated the level of complexity associated with the project. However, the task of creating an artificially intelligent entity proved to be far from straightforward. In light of various critiques regarding advancements in AI, the governments of the United States and Britain made the decision to cease funding for unguided research in this field in 1973. This response was prompted by the criticism put forth by James Lighthill, as well as the persistent pressure exerted by congress. The subsequent period, spanning from 1974 to 1980, was subsequently referred to as a *"AI winter"*, characterised by challenging circumstances in the realm. The discipline saw a revival in the 1980s as a result of renewed financial support from the British government, partially motivated by the desire to competing the Japanese initiatives in the field. However, in the late 1980s, investors grew dissatisfied with the lack of sufficient computer hardware capabilities and subsequently discontinued their financial support [2].

The period between 1987 and 1993 witnessed the occurrence of another significant winter event. However, subsequent to this decline, research efforts had a revival, ending in the significant milestone of IBM's Deep Blue defeating Russian grandmaster Garry Kasparov in 1997, so becoming the inaugural computer to triumph over a chess champion [2]. The first decades of the 21st century witnessed a significant surge in investment and interest in the field of AI. This surge can be attributed to the successful application of machine learning techniques to many academic and industrial challenges, facilitated by the availability of robust computer hardware. The aforementioned advancements encompassed the utilisation of extensive datasets, commonly referred to as *"big data"*, enhanced computational capabilities, and sophisticated machine learning methodologies. These developments have proven effective in addressing a wide array of challenges across various sectors of the global economy. According to a renowned publication by McKinsey Global Institute titled "Big data: The next frontier for innovation, competition, and productivity", it was projected that by 2009, the majority of sectors within the United States economy possessed an average of 200 terabytes of stored data [5].

B. A Concise Historical Overview of Chatbots

The historical development of chatbots may be traced back to the early days of artificial intelligence (AI) research. In the year 1950, Alan Turing put up the proposal of the Imitation Game as a potential alternative to the question, *"can machine think?"* According to [6], he made a prediction that by the year 2000, advancements in technology would lead to the development of computing machines with a logarithmic capacity of bits. He further hypothesised that with such advanced equipment, a computer programme would have the capability to deceive an average questioner for a duration of 5 minutes, achieving a success rate of approximately 70%.

In the year 1976, Weizenbaum's Eliza programme provided evidence that a basic computer programme could effectively engage in the imitation game, as initially proposed by Turing. Eliza achieved this by employing a limited number of strategies, with the most significant one involving the use of interrogative responses to answer questions [7].

Tinymud is a text-based virtual world platform that was developed. Mauldin [6] states that in August 1989, Jim Aspnes initiated the establishment of Tinymud, a refined adaptation of Richard Bartle's multiuser dungeon (MUD). The significant characteristics of Tinymud encompass:

- Interpersonal discourse involving multiple participants.
- The concept of "textual scenery" involves the simulation of actual environments through written descriptions.
- User extensibility.

The inclusion of a feature that allowed users to generate their own subareas within the globe model was a significant factor in the widespread popularity of Tinymud. Tinymud facilitated an environment wherein individuals engage in communication primarily through the act of typing. The availability of a substantial number of possible judges and interviewers made this situation appear to be a promising opportunity for doing research on the Turing test [8]. In Tinymud, computer-controlled players are commonly referred to as *"bots"*, a term derived from the word *"robots"*. A number of basic robots were developed, and Eliza was also integrated with a stationary robot, allowing players to engage in conversation with Eliza while entering a specific cave alone [8].

A computer-controlled player, referred to as a *"Chatter Bot"*, was developed to engage in conversations with other players, navigate the virtual world, uncover novel routes within different rooms, offer guidance on navigation by providing the shortest-path information upon request, and respond to inquiries regarding other players, rooms, and objects. The AI system is capable of participating in a multiplayer card game known as *"Hearts"* and has achieved success by successfully executing the strategy of "shooting the moon" on multiple occasions [8]. The conversational capabilities were initially integrated using rudimentary IF-THEN-ELSE rules, which relied on pattern matching and variable assignment. According to Mauldin [8], patterns typically exhibit several outputs that are provided in a random and nonrepeating order, which allows for the effective handling of repeated inquiries.

The major objective of this endeavour was to construct a conversational agent that had the capability to respond to inquiries rather than disregarding them, and to sustain a coherent chain of suitable responses instead of depending on unrelated statements. The responses incorporated a substantial amount of humour and effectively made an agent more captivating than Eliza. Wired magazine characterised their programme as a "hockey-loving ex-librarian with an attitude" [9]. The ChatterBot is able to prosper in the Tinymud environment due to its effective implementation of an inconspicuous Turing test. This implies that players operating within the game presume that all other participants are human beings, and so extend the ChatterBot the presumption of being a person until it commits a significant error [8].

Reference [8] further describes a ChatterBot as a robot Tinymud player primarily designed to engage in conversation. In instances where there is a limited number of players actively engaged in the game, certain individuals perceive conversing with an artificial intelligence entity as a more favourable alternative to experiencing a lack of interpersonal communication. The ChatterBot is constructed as a C programme comprising multiple modules that handle the diverse functions necessary for automating a player in the Tinymud universe.

The manuscript is organized into four main sections: I. Introduction: This section provides an introduction to Artificial Intelligence (AI) and its impact on education. It also discusses the historical background of AI and its challenges. II. concept of Chatbots: In this section, the concept of chatbots is defined and their components are explained. Various methodologies and classifications for chatbots are discussed, including their cognitive capabilities and intended functions. It also highlights customization and functionality of prominent Chatbots in the mobile phone industry and the implications for financial inclusion and linguistic diversity of Chatbot implementation in Nigerian Banks. III. The integration of Chatbots in academic environment: This section explores the integration of chatbots in education, emphasizing their potential benefits and responsible adoption. It also discusses pedagogical considerations, both positive and negative impacts on students, and the role of chatbots in supporting teachers. IV. Conclusion: The conclusion section summarizes the manuscript, highlighting the historical trajectory of AI, its potential in education, and the need for responsible AI usage in educational settings.

II. CONCEPT OF CHATBOTS

According to [10] define a chatbot as a technological tool that integrates artificial intelligence (AI) and natural language processing, allowing it to engage in text or voice-based conversations with human users to a certain extent. In contemporary times, chatbots, referred to as conversational agents, conversational tutors, or simply bots, are increasingly being utilised throughout a wide range of scientific domains [10, 11]. Currently, a chatbot refers to a software application that engages in natural language conversations with individuals. Reference [12] and [13] assert that the system enables users to sustain interaction using a conversational interface that is specifically built to provide a simulated intelligent discourse with human beings employing natural language. Various methodologies in natural language processing (NLP) are employed to enable the chatbot engine to comprehend client inquiries and generate responses utilising one of the response generation models.

A. Components of a Chatbots system

According to [12], a chatbot consists of three distinct components:

- The Respondent
- The classifier
- And the Graphmaster

The respondent serves as the component that performs the function of mediating between the core functionalities of the chatbot and the user. The primary function of this system is to facilitate the transmission of user information to the Classifier and manage the check-in and check-out processes. The Classifier serves as an intermediary between the Responder and the Graphmaster. The primary purpose of this system is to do the filtration and normalisation of user input, converting their words into logical elements. The resulting normalised phrase is then passed on to the Graphmaster, which processes the output and utilises the syntax of the database. The Graphmaster serves as a junction point for patterns. The primary purpose of this layer is to organise the content submitted by the user, and to maintain and retain the matching algorithms associated with the patterns. The primary factor influencing the performance of voice-based chatbot bots is the use of verbal signals, with language style being the most significant cue [12].

B. Classification of Chatbots

There exist various methodologies for classifying chatbots as out lined by [14]:

1) The cognitive capabilities of the chatbot can be characterised by its ability to adapt, reason, and exhibit autonomy.

2) The concept of adaptation pertains to the extent to which a chatbot is capable of being aware of its context and utilising that awareness to modify its interaction with the user.

3) The process of reasoning in a chatbot can be understood as the manner in which it makes decisions, which can be based on logical principles established by a human or acquired through learning from data.

4) The aspect of autonomy pertains to the extent to which the chatbot depends on human input, distinguishing between complete autonomy and a hybrid approach.

5) Similarly, Chatbots can also be delineated based on their intended function:

1) Generalist bots, such as Apple's virtual assistant Siri, are designed to perform a wide range of activities and often provide users with basic assistance while also directing them to more resources when necessary.

2) Transactional bots are primarily designed to perform specific tasks, such as facilitating the process of making a purchase.

3) Informational bots are a type of automated software agents that are designed with the primary objective of collecting and providing information to users.

4) Productivity bots are specialised bots designed to enhance and optimise productivity. One instance of this is the streamlining of repeated jobs, thereby relieving humans from the burden of performing them.

Additionally, there exist communication chatbots that prioritise facilitating user communication [14], such as the task of connecting customers with appropriate customer service agents for their specific concerns. However [15] propose that the classification of chatbots can be based on many factors, including the knowledge domain, service provision, purposes, and generated responses.

1) The knowledge domain of the Chatbot is contingent upon the information it has access to. There exist two distinct categories of domains: open domains and closed domains.

a) Open domain Chatbots are designed to engage in conversations on a wide range of topics and provide suitable responses to general inquiries.

b) The bots designed for closed domains are programmed to handle specific areas of knowledge and may have difficulties in providing responses to inquiries outside of their designated domains.

2) The Chatbots that provide services can be classified into three categories: interpersonal, intrapersonal, and inter-agent services.

3) The categorization of goal-based Chatbots includes instructive, conversational, and task-based Chatbots.

4) The final category includes Chatbots that are classified depending on their input method and the subsequent responses they generate. There exist Chatbots that possess the capability to accept input, process and generate output using natural language, while others operate on a rule-based system where input is processed according to predefined criteria.

Additionally, there exist other chatbots in this particular category that employ a combination of natural language understanding and rule-based approaches to effectively process user input and provide appropriate responses [15]. Notably, Chatbots have been employed for educational purposes for a considerable duration. Chatbots were also classified into two categories based on their intentionality towards education by [15] as: those with educational intentionality and those without educational intentionality (i.e., educational and non-educational Chatbots).

1) Chatbots lacking educational intentionality are employed in administrative functions, such as providing guidance and support to students.

2) Chatbots designed with educational intentionality are utilised to facilitate the process of teaching and learning. Within this particular category, there exist Chatbots that serve as the foundation for the learning process. These Chatbots are responsible for selecting and organising educational content in a manner that aligns with the individual needs and pace of the students.

Additionally, they assist in fostering reflection and enhancing motivation for learning. These automated systems serve as educational companions that facilitate discourse, collaboration, and reflection. In addition, there exist exercise and practise Chatbots that employ a question-based approach, wherein students are prompted with a stimulus and are required to provide an answer. These responses are subsequently evaluated by the Chatbot, which in turn offers feedback to the student [15].

Therefore, when determining the aim of the chatbot, it is necessary to make a decision regarding whether to develop the chatbot internally from the ground up or to utilise third-party services that facilitate both the development and distribution of chatbots. Reference [14] posit that, Microsoft, Facebook, and Google offer various services pertaining to the creation, distribution, and customisation of their respective products. If an organisation lacks the necessary expertise to independently design a chatbot or does not require a highly tailored chatbot, this option may be appealing.

C. Prominent Chatbots in the Mobile Phone Industry: Customization and Functionality

According to [13], numerous prominent mobile phone manufacturers have developed their own chatbots, which consumers decide to customise in order to enhance the convenience of specific functions. Presented below are a selection of examples that hold particular relevance.

1. Siri - is an artificial intelligence-based virtual assistant that was created by Apple and is designed to operate exclusively on the iOS operating system. Siri facilitates users in doing information searches, sending messages, organising calendars, accessing weather data, and executing various other user-oriented functions.
2. *Alexa* is an artificial - intelligence-based conversational agent designed for Amazon Echo smart speakers, capable of processing and generating responses to voice-based instructions. Alexa provides assistance in various domains such as home automation, music playback, and information retrieval, among other functionalities.
3. *Google Assistant* - is an artificial intelligence-based virtual assistant created by Google, designed to effectively address user inquiries and execute user commands. The Google Assistant is a multifunctional tool that aids in many tasks such as doing searches, managing calendars, providing navigation assistance, facilitating translations, and performing other related operations.
4. *Xiaoice* - is a widely recognised Chinese chatbot that has been developed by Microsoft. Xiaoice, an emotionally intelligent chatbot, possesses the capability to perceive and react to human emotions, hence facilitating extended interactions with users.

There exist several chatbot systems, like ALICE, Ultra, and Cleverbot, which strive to replicate human speech with greater accuracy [12]. Chatbots have found extensive use in various platforms and applications, including websites, mobile applications, and social networking platforms. They can be accessed by individuals through many channels such as websites, applications, social media platforms, and voice interfaces, enabling communication between users and these automated conversational agents.

D. Chatbot Implementation in Nigerian Banks: Implications for Financial Inclusion and Linguistic Diversity

A significant proportion of Nigerian banks have implemented chatbot technology to facilitate client engagement and promote financial inclusion. The platform that was most commonly utilised was WhatsApp. Chatbots were frequently associated and presented with feminine gender identification.

The chatbots exhibited reduced responsiveness outside of their predetermined trajectory. Nigeria, as a linguistically diverse nation, employs English as its primary language. However, the chatbots utilised in various studies failed to incorporate any of the indigenous languages spoken by Nigerians [16]. Nigeria serves as a pertinent and significant setting for investigating the digital revolution within the financial services sector [16, 17], specifically focusing on the utilisation of chatbots as a tool.

According to [16] conducted a study that acknowledges the significance of digital transformation in fostering the social and economic progress of a nation, with a particular focus on Nigeria. This nation represents one of the largest emerging markets and is also renowned for being the most populous country in Africa. The paper examines the utilisation of chatbots as a means of digital transformation in the context of financial inclusion and consumer interaction. It focuses on the various capabilities of chatbots and their potential to improve customer happiness and boost digital capabilities. The report acknowledges that while facing intrinsic obstacles such as limited access to electricity and unreliable internet connectivity, there is potential for adapting digital technologies to effectively cater to customer demands.

III. The Integration of Chat Bots in Academic Environment

Emerging technologies and educational systems are increasingly collaborating to incorporate enhanced functionalities, aiming to enhance cognitive capabilities. However, it is important to note that these advancements will invariably require supplementary applications that are compatible with the existing systems. According to [12], it is widely acknowledged that the process of learning should be overseen by proficient managers who possess expertise in the respective sector. This supervision is crucial as it enables managers to

provide guidance to users, ensuring that they consider and provide the most optimal responses to the questions presented.

Reference [13] posits that the future of education is progressing towards a cooperative relationship between technology and human interaction, with the aim of enhancing learning experiences and fostering student growth. As AI and chatbots continue to advance, they offer promising prospects for personalised learning, interactive instruction, and enhanced educational efficiency. The integration of AI into the field of education is an unavoidable occurrence. Intelligent tools offer various potential, including personalised education, automated assessment, and the utilisation of virtual assistants or chatbots for teaching purposes [13]. In light of these developments, it is imperative for educators to adopt these technologies judiciously rather than seeking to replace traditional teaching methods.

According to [15], the Chatbot industry is experiencing significant expansion in the era of AI, mostly driven by the heightened demand for smartphones and the growing utilisation of messaging services. Over the recent years, the utilisation of Chatbot technology has been increasingly adopted by the food delivery, finance, and E-commerce sectors. The educational sector is a prime candidate for leveraging this technology to yield significant advantages. The creation of Chatbots has the potential to yield significant benefits for the field of education. The utilisation of technology has the potential to enhance productivity, facilitate effective communication, support learning processes, provide efficient teaching help, and reduce ambiguity in interpersonal interactions. The utilisation of this technology as an engagement tool in a novel education platform has the potential to address advanced challenges in the field of education.

However, from an educational perspective, chatbots possess the capability to promptly address students' inquiries, furnish them with assistance, and offer general knowledge, contingent upon the nature of the query. This platform diverges significantly from a question-and-answer forum, wherein the individual posing the question often has prolonged waiting periods before receiving a response. Virtual assistants have the potential to serve as virtual educators within the realm of education. The virtual teaching agents have the capability to actively participate in dialogue and engage in interactions with the user, resembling an authentic educational setting [13]. One notable advantage is their ability to utilise the vast array of information accessible on the network to generate responses and address inquiries on many subject matters.

Thereafter, Chatbots possess a multitude of applications, encompassing customer service, virtual assistance, and notably, education. The introduction of ChatGPT towards the conclusion of 2022 had a profound impact on global dynamics, garnering widespread recognition and familiarity with this artificial intelligence system [13]. The study of [18] suggests that there is a pressing need to revise assessment methodologies and institutional policies in educational institutions, based on an analysis of the initial quarter of the ChatGPT. The training of educators and the education of students are necessary in order to effectively address the influence of ChatGPT on the educational landscape.

Nevertheless, Chatbots in the field of education are capable of carrying out a variety of tasks, including but not limited to addressing frequently asked questions (FAQs), managing administrative duties, providing guidance and support to students, fostering motivation, conducting assessments of student learning, facilitating simulations, delivering targeted training for specific skills and abilities, and offering opportunities for reflection and metacognitive strategies. Cardenal Herrera University (CUE) has implemented a Chatbot system designed to offer mentorship to students and address their inquiries. The Chatbot functions as a personal assistant for managing administrative inquiries [15]. However, ongoing efforts are being made to expand the Chatbot's capabilities in order to anticipate student behaviour and provide guidance during the learning journey.

A. Chatbot Adoption and Pedagogical Considerations in Educational Environments

In a study conducted by [11], it was found that teachers perceive technology as advantageous for both themselves and their students, the utilisation of chatbot technology in teaching has been highly valued by educators. This positive perception also applies to the utilisation of chatbots in the context of teaching and learning. It is important to take advantage of this positive perception in order to initiate a shift in teaching-learning environments, moving away from traditional approaches and embracing social-constructivist principles. By doing so, educators can strive to achieve improved outcomes in teaching and learning. This necessitates the provision of training for teachers in effective strategies for integrating educational technology.

Chatbots have the potential to be utilised in diverse instructional situations as an educational tool. Currently, there is a limited amount of research conducted in developing countries regarding the specific applications of chatbots in educational settings [19]. This includes investigating the perspectives of key stakeholders such as teachers and students, as well as examining the actual benefits derived from their use. However, there is existing research on the utilisation of computers in instructional settings, as well as the use of chatbots in certain educational contexts. It is worth noting that the majority of the research in this area primarily focuses on health-related applications and language learning. In order to attain adaptability, a chatbots would want personalised information derived from students, hence posing a predicament as the acquisition of data is dependent upon the availability of data. Hence, the preliminary phase of creation is characterised by a degree of uncertainty, accompanied by inquiries regarding the aspects that students deem valuable in the chatbots [11, 12, 19]. If the primary value of the chatbots lies in the information it offers rather than its mode of delivery, then the chatbot is seen to have no inherent value. Therefore, it is likely that the student may have a preference for a conventional website or other forms of media.

However, the chatbots possesses the capability to engage in inquiry and exert influence on user behaviour through the use of questioning techniques, in addition to providing responses to user inquiries. According to [12], autonomous execution of chatbots

duties, such as delivering delivery information or processing refunds, necessitates connectivity.

Furthermore, [11] posit that it was documented in scholarly literature, it is important to recognise that investing in new methods of learning and teaching differs from investing solely in technology and infrastructure, and currently, technology is primarily provided to schools without sufficient emphasis on addressing teachers' pedagogical perspectives and the practical challenges associated with integrating information and communication technology (ICT) in schools. Educators exhibit inconsistency over the appropriate circumstances in which to employ a chatbots for instructional purposes. The teachers have identified time loss as the primary motivation, which is attributed to the necessity of covering the syllabus, the busy school schedule, and the preparation required for nationally administered final examinations. Efforts should be made to allocate sufficient time within educational institutions for the effective integration of technology in teaching practises. This might be achieved, for instance, by mitigating curricular overload. Educators have also expressed the need for a chatbots that possesses the capability to address subjects beyond the scope of academic instruction [11]. By employing effective knowledge base design, chatbots designed for educational purposes can serve as a valuable tool for both instructors and students to access information that extends beyond the immediate scope of school curriculum and related matters.

Reference [19] assert that In order for a chatbots to gain acceptance and usage, it is crucial that it possesses a user-friendly interface and does not impose excessive demands on users in terms of familiarity acquisition. The consideration of complexity is thus incorporated into the assessment of perceived perceptions regarding chatbots. According to [19], chatbots that are extremely complicated and incorporate numerous features may pose challenges for users in terms of comprehensibility. Consequently, users may prefer utilising simpler alternatives.

Similarly, [15] posits that chatbots have the potential to support students in enhancing their communication skills, facilitating research activities, and evaluating online examinations. The use of AI-Chatbot technology into the education industry is expected to enhance the implementation of student-centered learning approaches. The aforementioned research suggests that students are increasingly adopting the utilisation of Chatbots, resulting in significant advantages being realised.

B. An Analysis of the Educational Benefits and Drawbacks of Chatbots on Students' Leearning

Reference [13] claims that there is a discernible both positive and negative impact of chatbots on students:

1) *Interactive learning:* The utilisation of chatbots facilitates interactive learning and fosters communication through question-and-answer interactions. Students have the ability to pose inquiries to chatbots, which in turn provides responses, so facilitating the expansion of their knowledge and comprehension of the subject matter. This educational approach provides students with the option to engage directly with an intelligent system and receive assistance in their learning journey.
2) *Personalized help:* chatbots has the capability to offer tailored support to pupils. Students have the ability to direct their attention towards certain inquiries and challenges, while chatbots possesses the capability to furnish diverse responses and elucidations. This enables students to receive individualised assistance for their educational needs, even in the absence of immediate availability of instructors or other mentors.
3) *Fast and available help:* chatbots offers prompt and accessible assistance, ensuring that students' inquiries and challenges are promptly addressed. This technology has the potential to provide prompt support to pupils in situations where rapid human intervention is not feasible due to time constraints or other circumstances. However, this observation also suggests that students may not fully harness the capabilities of chatbots and instead prioritise immediate job completion over exploring its broader functionalities. chatbots also offers assistance to students who face restricted availability to educational resources.
4) *Language acquisition:* Chatbots can also prove to be beneficial in the context of language learning. Interactive communication allows students to engage in practical application of the target language, so facilitating the enhancement of their grammar and language proficiency with the assistance of. For example, ChatGPT possesses the capability to engage in conversation with students, offering them the opportunity to inquire about language acquisition and receive informative responses. The research conducted by [20] offers preliminary insights into the potential of ChatGPT in facilitating language instruction and acquisition. This engaging and dynamic interaction fosters an enhanced language learning experience.
5) *Potential for Incomplete or Inaccurate Information:* It is important to acknowledge that when engaging in communication using chatbots, there exists the possibility that the generated responses may exhibit deficiencies in terms of either being incomplete or including inaccuracies. This issue can provide a significant challenge when students lack the ability to recognise or rectify these errors. The reception of misconstrued or inaccurate information has the potential to misguide students and result in the acquisition of erroneous knowledge. As a result, in cases where chatbots lack comprehension of user inquiries, they can potentially engender dissatisfaction due to unsuccessful dialogue.
6) *The reliance on AI systems:* Such as ChatGPT, among students can potentially lead to a reduced emphasis on critical thinking and independent problem-solving abilities. The reliance on external sources of support may hinder students' ability to engage in self-directed learning and harm their long-term personal growth.
7) *Lack of personal contact:* One potential drawback of communicating with AI systems is the absence of

personal contact, which results in a deficiency in human interaction and interpersonal connection. The engagement of students with their teachers and classmates in the field of education holds significant value in facilitating the learning process. AI systems are unable to establish a human connection that encompasses emotional support and collaborative interactions.

8) *Privacy and security:* The issue of privacy and security arises in the context of AI systems, such as ChatGPT, which have the capability to gather and retain data during interactions with students. Ensuring the protection and non-disclosure of student data is of paramount importance, necessitating the appropriate resolution of privacy and security concerns. Reference [12] posit that a significant portion of the information or data that is sent may possess a sensitive nature, such as financial statements or medical test results, which necessitate appropriate notification to the user. Similarly, the efficiency of data consultation and the execution of procedures within both public and commercial organisations are questionable, with limited oversight of data access by external entities and a lack of citizen monitoring capabilities.

The research of [21] has additionally demonstrated that over utilisation of ChatGPT poses a potential threat to diminishing students' capacity for critical thinking and exacerbating educational disparities. The aforementioned assertion was put out by ChatGPT. Meanwhile, the present investigation examines the level of students' understanding of the utilisation of a chatbot (A-uC), which is a form of artificial intelligence technology, for the purpose of violence prevention among elementary school students, as explored by [22]. The present study has identified chatbot technology as a valuable instructional tool in the context of violence prevention education for elementary school children. Chatbots, classified as a form of artificial intelligence, have emerged as a viable tool for implementation across several educational domains. Hence, it is imperative to develop ways that might optimise the educational outcomes of chatbots in order to foster greater interest in their utilisation.

C. The Impact of Chatbots on Teachers

Chatbots have emerged as a technological innovation with the potential to revolutionise various industries, including education. Annuš [11] also explores the impact of chatbots on teachers.

1) *Support materials and resources:* for instance, a ChatGPT can assist educators in generating support materials and resources. Teachers have the ability to utilise ChatGPT as a tool for producing additional educational resources, such as supplemental lessons, examples, or exercises, that can effectively complement the existing curriculum. This has the potential to offer pupils a more diverse and comprehensive range of content.

2) *Generate tests and assignments:* Chatbots like ChatGPT possesses the capability to assist educators in the development of assessments, assignments, and homework materials. Educators have the ability to formulate inquiries utilising ChatGPT, and the aforementioned system possesses the capability to provide responses to pupils. This assessment can evaluate students' comprehension and enable educators to track their academic development.

3) *Research tool:* The utilisation of chatbots as a research tool holds potential value for educators. Educators have the opportunity to utilise. ChatGPT as a tool for inquiring about research subjects or pedagogical concerns, whereby the system can furnish comprehensive insights and information. According to [13], this can facilitate teachers in enhancing their own knowledge and fostering ongoing improvement in their teaching practises.

D. Educational Considerations in the Era of Chatbots and Artificial Intelligence

Balancing the Benefits of Chatbots with the continued importance of human guidance and interaction in education cannot be overemphasize. The utilisation of chatbots facilitates the interaction between individuals and businesses, particularly in the realm of customer service. However, it is important to note that while chatbots can enhance operational efficiency, they are unlikely to entirely supplant human roles inside organisations or educational institutions [12]. Reference [13] explores several considerations such as critical thinking and interpretation skills, supervision and leadership, and emotional support and personal interaction.

The cultivation of critical thinking and interpretation skills is crucial for both educators and students, as they navigate the realm of AI-generated content. It is imperative to acknowledge the constraints and take into account the potential for errors and deficiencies inside AI systems. It is imperative for educators to engage proactively in the oversight and interpretation of educational material. It is imperative for teachers to assume the responsibility of overseeing the utilisation of AI technologies. The management of content generation and the assurance of its accuracy and dependability are of utmost importance. It is imperative for educators to provide guidance to students regarding the appropriate use of AI systems and to foster their comprehension of the inherent limitations associated with such technologies.

Similarly, teachers maintain their crucial role in providing support and leadership to students through ongoing interaction. Furthermore, alongside the use of artificial intelligence systems, educators persist in their role of facilitating student advancement, directing the learning process, and delivering feedback and evaluation. AI technologies cannot serve as a replacement for human engagement and emotional support. It is imperative for educators to prioritise the fulfilment of students' emotional needs through human engagement [13]. In conjunction with the utilisation of AI systems, it is imperative for educators to establish a sense of personal connection and foster a collaborative learning environment.

II. CONCLUSION

In conclusion, the historical trajectory of AI has been characterised by alternating phases of enthusiasm, disillusionment, and revival. Since its establishment in 1956, the field of AI has made significant progress, particularly due to the improvements in machine learning and large data to the development of Chatbot. Within the field of education, AI presents considerable potential for augmenting the quality of teaching and learning experiences. This technology has the capability to offer tailored assistance to individuals, as well as restructure a range of educational responsibilities. Nevertheless, the future still necessitates careful examination of concerns around employment displacement and the imperative for responsible usage of artificial intelligence. The constant research and debate surrounding the impact of AI on education and society as a whole is a consequence of its continuous evolution. The findings underscore the significance of maintaining a balance between AI-driven support and continued human guidance in educational settings. The paper highlights the value of chatbots in education, emphasizing their ability to offer personalized assistance, prompt responses, and support in language acquisition. It also acknowledges potential challenges, such as the risk of incomplete or inaccurate information and a potential overreliance on AI, which may hinder critical thinking skills. Furthermore, it addresses the importance of data privacy, security, and the need for educators to prioritize emotional support in tandem with AI interactions.

To ensure successful implementation, the paper recommends ongoing research and development in the field of AI and chatbots, with a focus on optimizing their use for educational purposes. Educators should receive training in effectively incorporating chatbots into their teaching practices, while policymakers should establish clear data protection guidelines. Critical thinking skills should be emphasized, and efforts should be made to provide emotional support alongside AI-driven assistance. Collaboration between educational institutions, researchers, and tech companies is encouraged to stay up to date with AI advancements and align chatbots with the evolving needs of the education sector.

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