ChatGPT and Social Science Research in Higher Education

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Abstract

In recent times, advancements in Artificial Intelligence (AI) have made promises for major technological developments. AI has broadened the scope of computer applications, which has expanded to understand real-world problems. ChatGPT, the artificial intelligence tool, has further gained popularity in a short span of time. In the field of education and research, ChatGPT is used widely as a tool to ease out prominent research tasks like the generation of problems, literature review, providing problem statements, etc. A large portion of the research community has been using this tool without any reasonable restriction or any mechanism of checks and balances, further fostering a threat of unethical research practices. However, is the usage of ChatGPT de-burdening researchers, or is it suppressing creativity? Will the usage of ChatGPT contribute to research in higher education, or will it be detrimental? This paper aims to understand the impact of ChatGPT on social science research in higher education. With the aim of understanding the concept of artificial intelligence and ChatGPT, this paper locates the potential challenges which are caused by using the chatbot in the field of education and research.

Keywords: Chat GPT, Artificial Intelligence, Social Science Research, Technological Intervention

Introduction

AI and ChatGPT are the current buzz in the world of technology which has the potential to affect every other domain of human life. Countries across the world are investing a lot in the development of artificial intelligence. ChatGPT has been rapidly growing as a tool to solve problems in the human world. It is the recent advancement in artificial intelligence which has caught attention because of its ability to understand human conversation and generate responses- this is termed generative AI.

The impact of ChatGPT on academic learning and higher education has been high. As it has been accused of being misused by the academic community. Some have also appreciated its intervention as an effective tool which aids in generating new research ideas and developing research outlines. However why is there a need to have tools to generate ideas? Is not research by default a method of arriving at the new? Especially in a discipline like social science, whose epistemological premise is thinking and creating. Paradoxically, rather than aiding researchers and academicians in the task of writing and research, ChatGPT can deprive them of understanding the essentials of the discipline. The confluence of ChatGPT and social science needs a deeper understanding as ChatGPT, apart from aiding, is altering the epistemology of the discipline. Therefore, this paper tries to understand the ChatGPT tool of artificial intelligence in the first section. In the second section, the paper analyses

the impact of ChatGPT on social science education.

Research Objective

The objective of this paper is to understand the contours of artificial intelligence in order to distinguish between various types of artificial intelligence. The primary focus of the paper is on ChatGPT tool of artificial intelligence and how does it impact the academic discipline. Further investigating the impact of use and misuse of ChatGPT in social science research. A discipline whose foundation lies in generating ideas and perspective how is the chatbot impacting the nature of this discipline.

Methodology

The methodology used is qualitative in nature. Though qualitative research is an umbrella term for a range of strategies conducting inquiry that are aimed at discerning how human beings understand, experience, interpret and produce the social worlds, this article particularly maps how social science research itself is undergoing a magnitude of change through ChatGPT and the possible impact it may have. It is therefore exploratory on the one hand and critical and analytical on the other.

Literature Review

Prieto-Gutierrez, Juan-Jose & Segado-Boj, Francisco & França, Fabiana. (2023) in their article "Artificial Intelligence in Social Science: A Study Based on Bibliometrics Analysis. Human Technology" have argued the progression of artificial intelligence is inevitable through their analysis, they have observed that the impact of AI in the discipline of social science can improve quality of life and help institutions in dealing with global challenges by developing theories, bringing change in education, society, law, politics and thereby advancing economic growth in the country.

Sadiku, Fagbohungbe and Musa (2021) noted in their paper "Artificial intelligence (A.I.) in Social Sciences: A Primer" a fourfold application of AI on social science, which they outline as:

Explainable AI: This type of AI will be useful in arriving at definitions, concepts and theories. Generally, people lack the trust and confidence to believe in explanations which are generated by humans based on set data or small sample sizes. The use of AI in this field will be instrumental in generating definitions and explanations which can be universal in nature. The field of explanation AI is an under researched area which has potential for emerging as a lucrative research subject.

AI-assisted Peer Review: In the domain of social science research, peer review of the research work is a long and exhausting process. As there is an increase in demand for peer review due to the volume of submissions and the multiplicity of peer review journals. This arrangement often exerts pressure on the reviewer and subjects their review to scrutiny for being biased. The development of AI tools to assist the peer review process would help in fastening the process with a decreased risk of biases. The tool can provide authentication and help in gaining reliability and trust in the peer review process.

Human Behaviour: AI's access to large data sets can help in understanding human behaviour better. In the discipline of social science research, it can comprehend social interactions and map human behaviour in different social setting. The conclusion thereby made will to the best possible extent free from judgments and biases of any nature.

Human Labour: One of the major

criticisms of AI is that it can completely replace human labour and create large-scale unemployment. Well, definitely, it will be an alternative to human labour; nonetheless, it will generate new-age jobs and employment opportunities which will be free from manual work and reduced errors. AI will create opportunities in the field of technology and computers, which will be less physically and socially exploitative as compared to jobs based on manual labour.

Banerjee, Debraj, Souvik and Dey (2023), in "Role of ChatGPT on Social Science Research in Future Perspective", have concluded about the advancement which can be brought by the artificial intelligence tool ChatGPT in social science research. As they observe that the tool can help in aiding the time-consuming yet crucial elements of research like locating research problems, summarizing research, comprehending literature review, data analysis, analysis of text, generating research questions and the like. Which can be instrumental to research, thereby simplifying the tedious tasks and making research student-friendly and less time-consuming.

The literature cited above has understood the impact of Artificial intelligence and one of its tools, ChatGPT, as an enabler in doing social science research. They note t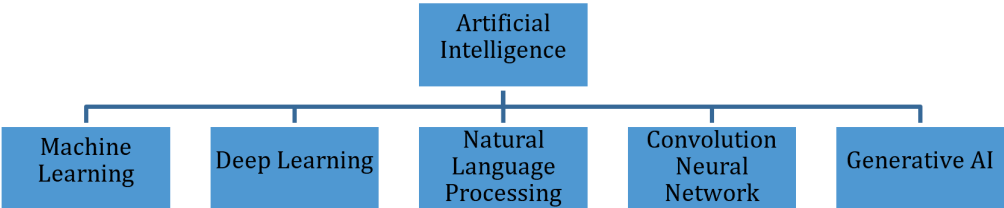hat the progression of AI and, subsequently, ChatGPT would transform the way social science research is conducted, thereby creating a differential impact in the field of public policy, governance, development, society, etc. However, the given literature and research done in the domain of AI and social science research have yet not grasped the impact of AI tools on the nature of social science discipline. Social science, whose genesis is embedded in the field of critical thinking and creative analysis how will be impacted by the advancement of AI in this field. This shortcoming has generated a void in this field of inquiry; thus, this paper is an attempt to bridge this research gap.

Artificial Intelligence

Artificial intelligence (AI) is the byproduct of advancement of technology which marks the period of fourth industrial revolution. It is the branch of computer science which is advancing rapidly. Artificial Intelligence, unlike computer science, which progressed in digitization of work, aims to create machines which are intelligent, self-modulated and generative. This means the task of such machines would not be restricted to an input of command and output of result, but it will extend to thinking, analyzing, evaluating and thus producing a result which is suitable. Artificial intelligence poses a serious threat to human work and labour as through its capacity and intelligence; it might replace humans.

Types of Artificial Intelligence

Figure-1: Types of Artificial Intelligence

Artificial Intelligence
- Machine Learning
- Deep Learning
- Natural Language Processing
- Convolution Neural Network
- Generative AI

There are numerous types of AI; however, out of a huge list, there are five dominant types of AI, namely machine learning, deep learning, natural language processing, convolution neural network, and generative AI. Machine learning is a type of AI which uses an array of data sets to understand patterns and provide output. (Deng and Lin, 2022). Deep learning is a subset of machine learning, which means this category of AI is also dependent on data for generating results. However, deep learning is based on a neural network which compromises two or more layers. Natural language processing (NLP) is a type of AI which is based on the neural network model that uses algorithms to understand and generate human-like conversations. Neural networks basically replicate the structure of the human brain. Unlike deep learning, which has multiple layers, NLP comprises a web of networks (Deng and Lin, 2022). Convolutional neural networks (ConvNets or CNNs) using the neural network model have the capacity to be utilized for classification and computer vision tasks. Generative AI is the type of AI which can learn and update itself from existing data and algorithms. It does not repeat data but learns to update to provide accurate and relevant answers. Generative AI has the capacity for content like text, images, software code, graphic designs and the like. ChatGPT, which is the locus of this paper, cannot be categorised in any of the subtypes of artificial intelligence as it has some or the other features from each category. Moreover, ChatGPT should not be mistaken to be a type of AI but as an AI tool. The following section throws light on the nature of ChatGPT.

ChatGPT

ChatGPT (Chat Generative Pre-Trained Transformer) using natural language processing (NLP) was a tool developed by OpenAI. It is designed to generate human-like conversations by understanding the context of a conversation and generating appropriate responses. ChatGPT is based on a deep learning model called GPT-3 (Generative Pre-trained Transformer), which is trained on a large dataset of conversations. While ChatGPT is the tool with which human-like conversations can be made and understood by the machine, GPT-3 is the platform or the system upon which ChatGPT is based. ChatGPT is a variant of generative AI, which is different from normal AI. While normal AI requires datasets and algorithms to update from time to time, generative AI is self-learning and can update through learning from the available data sets.

ChatGPT is widely known for understanding human language and responding accordingly. It can take input in any language be it English, Spanish or Hindi. ChatGPT does not connect with a hyperlink but provide answer like it can write a letter, it can write a book on any given topic, it can write emails, short essay or even a thesis, generate music, debug software, create software, write codes and program and many other. Basically, it performs logical and reason-based task digitally to assist human world.

ChatGPT has claimed to make education accessible and interesting with the use of the tool; instead, it has been misused by students and the teaching fraternity for generating answers, assignments, making question papers, lesson plans and the like. Similarly, in the field of research, ChatGPT provides help by generating research problems, research gaps and research questions, which are the most time-consuming aspects of research; however, this intervention of the chatbot mares the sanctity of research. Especially with respect to social science research, which brings us to the last section of this paper, which is the impact of ChatGPT on social science research.

Methods in Social Science Research

Research in social science deals with- Sociology, History, Geography, Political Science, Economics, etc. and thus, all research based on these disciplines are social science research. Social science research can be historical, descriptive, exploratory, case study, experimental, comparative and textual. The two important tools to conduct social science research are- qualitative and quantitative. Where quantitative research specifies the type of research and techniques of data collection appropriate to the objectives of the project. Qualitative research is a tool for a detailed study of a social science subject. Through this tool, in-depth insight into real-life problems can be obtained. This type of research is not dependent on empirical findings but on normative data.

In social science research, whichever tool one uses, either qualitative or quantitative, there are set primary procedures to follow for finding the research gap, stating the hypothesis, locating the research problems/ questions, literature review, data collection, data analysis, hypothesis testing and thus conclusion. Each of these processes, whether it is a qualitative method of testing the hypothesis or a quantitative method, is equally important.

Chat GPT and Social Science Research

The relationship between technology, education and research is not new albeit it is modern. However, this relation in the latter case has impacted in both positive and negative ways. Talking about positive intervention, technology has enabled a method of creative pedagogy which is different from the traditional method of rote learning and classroom lectures. It has aided the usual teaching-learning process by providing pedagogical tools and providing creative learning outcomes (Rajendran, [1]2023).

Historically, computers have played a rather narrow role in social science, where statistical analysis was the most common application. Modern advancement in computer sciences has expanded the ambit of computation in the field of social science. Various research tools are now available for data collection and data analysis. Bibliographic retrieval, communications, instruction, and the graphic presentation of data and data modelling for all these advanced computer applications are available. However, all these developments aid in providing ease to mechanical tasks of social science. The key tasks of thinking, theorizing, conceptualization, or logical development of theories were not assigned to computers. (Drass, 1980)

Technological intervention, as claimed, made education accessible to people who are marginalized or for whom access to education is a problem. For instance, in case of the students who are especially abled, technology and its advancement has made education easy and accessible. Likewise in case of students in remote rural location the advent of technology has made education accessible. However, technology does not come without ill-effects there is a reverse side to the story of technological success. As pointed out by Henriksson and Karlsson, 2023 technology has disrupted education in two ways: one through the introduction of a learning management system in the 1990s and the second by Wikipedia.

Learning management systems (LMS) is a computer software which has been inspired from the concept of e-learning (Lafferty and Edwards, 2004). LMS platform are therefore managing courses, managing online assessments,

1   Rajendran, Madushan. (2023). Impact of Technology on Education.

giving feedback to the learners, and has enabled asynchronous education (Lafferty and Edwards, 2004; Al-Fraihat et al., 2020). Which enables access to education in the remotest parts of the country. E-learning gained popularity during the COVID-19 period as the entire education system shifted to e-learning platforms to continue with education during catastrophic situations. However, a model which was adopted during a health emergency faced by the world soon became the new normal. Online classes and education soon took over classroom lectures, and almost the entire education system has been dominated by LMS platforms. This domination by technology has rather been disabling. Firstly, adapting to e-learning platforms has not been easy, especially for teachers who have relied on traditional methods of teaching. Secondly, the availability of technology is one thing and accessibility of the same is another; not every household is equipped with computers or phones to enable e-learning, especially in India, where socio-economic diversities have been huge.

A second instance of disruption made by technology in the field of education has been with the advent of Wikipedia (Lafferty and Edwards, 2004). Wikipedia is an online free encyclopedia which is visited and the most cited encyclopedia on the internet. It is an open platform where all registered users can edit articles and add or delete information. This challenges the authenticity and reliability of the platform. However, since it is a widely used browser, its use in universities and schools have been rampant without any consideration of its validity. The paradox is that instead of resistance to the plagiarised content, it has gained popularity in the teaching-learning environment.

These are the two disruptions presented; nonetheless, another potential disruption in education is AI, majorly ChatGPT. Interestingly Artificial Intelligence (AI) has been considered one of the most effective tools for developing education globally. And the interest in the application of AI in higher education is gradually increasing. Hence, ChatGPT has created a huge roar in the academic community with both preachers and criticisers. ChatGPT, in its current operational form, has major intervention within the research domain. Apart from providing answers to questions, writing assignments and other academic work, the chatbot claims to generate new research ideas. It has been instrumental in accomplishing the primary yet crucial tasks of research like generating research gaps, writing problem statements, providing research questions and the like.

Agreeably, these primary tasks of research are the most time-consuming yet difficult part, but a solution like borrowing the same from a chatbot poses a serious threat to the entire community of research, especially social science research; in the preceding section, we shall see how. According to Richard Mason, 1986 AI-based innovations like that of ChatGPT pose serious ethical challenges in the field of research like Privacy, Accuracy, Property, and Accessibility.

Privacy is serious matter of concern with respect to ChatGPT which is largely data driven. The problem of data privacy is growing in research field. Meaning it has led to serious misuse of data and threat to the individual privacy.

Accuracy, the data which the chatbot uses to deliver results is not necessarily authentic or accurate. The data through which the chatbot is driven uses data quantitatively not qualitatively, as there are no filters to screen out inaccurate data. Hence overreliance on AI driven ChatGPT can be alarming.

Property is a serious ethical challenge with respect to AI-driven ChatGPT. The

results which the Chatbot delivers has no credible sources as it is gathered from a large set of data available with multiple authors and owners. In case of inaccuracy, piracy or, for instance, any kind of misuse of the parent data, who should be held accountable? The chatbot, the data, the software creator, the original owner, or the platform provider. The issue of ownership of intellectual property is a matter of serious ethical challenge in the use of the chatbot.

Finally, Accessibility, with respect to data it is not available to everyone, thereby creating a divide between those who have information and those who do not. This characteristic of data is discriminating. As it might leave behind a section of data "have nots" who will be bereft of information and hence may be at a loss. Those who have the information could benefit in an unjust manner. Unless access to information is universal the issue of undue advantage of data will sustain (Mason, 1986).

Apart from these ethical challenges outlined by Mason (1986) there are certain discipline centric problems with respect to the use of ChatGPT in social science research which are the key findings of this paper. These challenges can be understood as follows: creative, originality and epistemological.

ChatGPT, with its features of generating research ideas can impact human creativity showcased in social science research. Being a part of the humanities discipline social science research relies on ideas which are creative and different (Bryman, 2016). Unlike scientific research, which deals with logical inquiry and where the focus is on finding solutions, social science research is not based on pure logic but the reason that leads to the generation of new ideas, new relationships and interconnectedness Heylighen (1997). If the chatbot helps in generating ideas then the philosophy of creativity in social science will be hampered. In social science research, the beginning of the problem, which is -the creation of ideas, is the primary yet crucial element of research.

Secondly, the Originality of research is another problematic domain of inquiry with respect to the use of ChatGPT in social science. ChatGPT can generate ideas, provide problem statements, introduce research gaps and conduct literature review (Dowling and Lucey, 2023). If ChatGPT can provide all this to the consumer for use, who should be credited, the consumer or the chatbot? Who claims the ownership of research, and thereby, who will claim the copyright of the result thus produced? In the entire field of research, originality is of utmost importance. If ideas are not original and unique, how can they be called research in the social science discipline?

The third challenge emerges with respect to Ontology: the emergence of theories in social science is a result of the creation and destruction of ideas (Bryman, 2016)). Either by methods of falsification as presented by Karl Popper or through a paradigm shift outlined by Thomas Kuhn. The premise of social science research is based on the process of understanding research gaps to find answers. The task of locating research gaps to writing a thesis is a creative research process in the domain of social science (Richardson, 2000). ChatGPT, through its feature of generating research ideas, has reduced important research components to the mechanized tasks. Locating a research gap makes the researcher aware of the shortcomings of the subject to which he/she is introduced with knowledge of the field, second literature review, as opposed to its mechanized understanding, is rather a creative yet intellectual exercise which builds the foundation of

research, similarly generating problem statements. These elements are the very basis of the social science research. If these tasks are outsourced, then the purity and essence of social science will be seriously triggered. Thereby reducing it to a 'degree generating' exercise and not 'fact-finding' or 'creative-intellectual discourse.

Conclusion

Artificial Intelligence is a welcome development in the field of technology. Which has grabbed attention and keen interest from every field and industry. It promises to make tasks automated and supposedly provide ease to people. ChatGPT, the AI tool, is no less praised and widely used today by industry-specific personnel. However, in the realm of higher education and research, it poses a potential threat which can disturb the foundation of the discipline. It has ethical as well as epistemological challenges which can alter the core of social science research. Social science research is designed to not only provide answers to questions but also stimulate the creative-cognitive capacity of the individual. ChatGPT, without considerable checks and balances, will hamper the philosophy of social science research. ChatGPT needs a restriction as well as accountability for operation. Otherwise, unregulated usage of ChatGPT would generate content, which is not original but plagiarized, inaccurate and non-reliable. Ironically this kind of content will be widely used because it is easy and accessible. Thereby making the task of higher education and research go redundant and further replacing human originality and creativity with a chatbot.

Bibliography

Al-Fraihat, D. Joy, M and Sinclair, J. (2020). Evaluating E-learning Systems Success: An Empirical Study. *Computers in Human Behavior* (102): 67-86

Banerjee, Biplab and Paul, Debraj and Adhikari, Souvik and Dey, Samarjit. (2023). Role of ChatGPT on Social Science Research in Future Perspective: An Overview, October 12.

Bentley's. F. Arthur. (1978). Philosophy of Social Science, *American Journal of Political Science*, Aug, Vol. 22, No. 3

Brent, Edward. (1988). Is There a Role for Artificial Intelligence in Sociological Theorizing? *The American Sociologist*, Vol. 19, No. 2, pp. 158-166

Brodbeck, May. (1954). On the Philosophy of the Social Sciences. *Philosophy of Science*, Vol. 21, No. 2, pp. 140-156.

Bryman, A. (2016). *Social Research Methods*. Oxford University Press.

Deng, Jianyang and Yijia Lin. (2022). The Benefits and Challenges of ChatGPT: An Overview. *Frontiers in Computing and Intelligent Systems,* Vol. 2, No. 2

Dowling, Michael and Lucey, Brian. (2023). ChatGPT for (Finance) Research: The Bananarama Conjecture**.**

Drass, Kriss. (1980). The Analysis of Qualitative Data. *Urban Life* 9: 332-53.

Forsythe. E. Diana. (1993). Engineering Knowledge: The Construction of Knowledge in Artificial Intelligence. *Social Studies of Science*, Vol. 23, No. 3, pp. 445-477

Goller, Daniel, Christian Gschwendt and Stefan C. Wolter. (2023). "This Time It's Different"- Generative Artificial Intelligence and Occupational Choice. *Institute of Labor Economics*.

Harmon, Paul, and David King. (1985). Expert Systems: Artificial Intelligence in Business. Wiley.

10.7916/salt.v8i1.1498

Heylighen, F. (1993). Epistemology: Introduction.

Jen Hwang, Gwo and Nian-Shing Chen. (2003). Editorial Position Paper, *Educational Technology & Society*, Vol. 26, No. 2

Koertge. N. (1972). On Popper's Philosophy of Social Science. *Proceedings of the Biennial Meeting of the Philosophy of Science Association*, Vol. 1972. pp. 195-207

Lafferty, S., and Edwards, J. (2004). Disruptive Technologies: What Future Universities and Their Libraries? *Library management*, *25*(6/7): 252-258

Preston, Beth. (1993). Heidegger and Artificial Intelligence, *Philosophy and Phenomenological Research*, Vol. 53, No. 1, pp. 43-69

Prieto-Gutierrez, Juan-Jose & Segado-Boj, Francisco & França, Fabiana. (2023). Artificial Intelligence in Social Science: A Study Based on Bibliometrics Analysis. *Human Technology*. 19. 149-162.

Rajendran, Madushan. (2023). Impact of Technology on Education

Rich, Elaine. (1985). Artificial Intelligence and the Humanities, Computers. *The Humanities*. Vol. 19, No. 2, pp. 117-122

Richard, D. Mason. (1986). Four Ethical Issues of the Information Age. *MIS Quarterly 10(1)* 5.

Richardson, L. (2000). Evaluating ethnography. *Qualitative Inquiry*, 6(2), 253–255. https://doi.org/10.1177/107780040000600207

Sadiku, N.O Mathew, I. Fagbohungbe, and Sarhan M. Musa. (2021). Artificial intelligence (A.I.) in Social Sciences: A Primer. *International Journal of Engineering Research and Advanced Technology (IJERAT)*. Volume.7, Issue 4. April -2021

Shackter, Henriksson. Emilia and Marcus Åshage Karlsson. (2023), Race Against the Machine: Managing Disruption of Generative AI in Higher Education. Umea University.

Shimbori, Michiya. (1979). Sociology of Education, *International Review of Education*, Vol. 25, No. 2/3, pp. 393-413

Torshin, Ivan. (2023). Deep Learning for Natural Language Processing: Current Trends and Future Directions. 10.13140/RG.2.2.25409.53602.