

## ChatGPT: A new study tool shaping the future for high school students

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**Abstract** – With the rapid progression of technology and the growing presence of natural language processing applications in everyday life, it is essential to explore how high school students engage with these tools and how they foresee their futures in light of these advancements. The goal of this study is to analyse the usage patterns and future value perceptions of ChatGPT among 70 high school students through a survey-based approach. A key finding highlights that technology has become an integral element of contemporary life, underscoring the historical relevance of Natural Language Processing (NLP) and the eagerness of the younger generation to adopt such emerging technologies. High school students utilise ChatGPT for various purposes, including academic support, social communication, and personal management, across both educational and social contexts. Moreover, the participants conveyed a positive outlook on the potential of ChatGPT to significantly impact their lives in the coming years while acknowledging possible hurdles. Based on the findings of this study, it is clear that NLP tools like ChatGPT have a crucial role in moulding the experiences and anticipations of high school students. This paper, therefore, sets the stage for additional research and development in this area.

**Keywords** – ChatGPT, High School Students, Study Tool, Academic Performance, Digital Resources

### I. INTRODUCTION

Technology advancements have significantly influenced various aspects of life, including the way educational systems function and prepare students for an increasingly interconnected world. Embracing technology is crucial for high school students, as it not only enhances their learning experience but also equips them with the skills needed to succeed in the modern workforce, where technology plays a critical role [1, 2].

Fostering technological adaptability and openness early in a student's educational journey can contribute to their future success. One of the most

common challenges faced by both students and employees is the retention and comprehension of data and information. Natural Language Processing (NLP) technology has emerged as a powerful tool for processing and analysing information effectively, thereby improving comprehension and retention for users [3, 4].

OpenAI's state-of-the-art NLP technology, ChatGPT, has proven particularly beneficial for high school students seeking to enhance their understanding of various subjects. The ChatGPT platform allows students to engage in interactive conversations, similar to human interactions, where they can clarify doubts, explore new concepts, and

reinforce their learning. Utilising innovative tools like ChatGPT offers numerous advantages, such as improved student engagement, efficiency, and enjoyment, ultimately revolutionising their study experience.

The adoption and use of technology, especially NLP tools like ChatGPT, can significantly enrich the learning experience for high school students. By cultivating a culture of technological openness and leveraging innovative tools, students can not only improve their academic performance but also prepare themselves for the evolving challenges and opportunities in the digital landscape. This paper aims to investigate how high school students utilise this cutting-edge technology, embrace its potential, and harness its power to achieve greater success in the future [5, 6, 7].

## II. LITERATURE REVIEW

The field of natural language processing (NLP), a prominent branch of artificial intelligence (AI) research, has captured the attention of both the academic and industrial sectors. NLP algorithms and models enable computers to comprehend, interpret, and generate contextually relevant human language. AI-driven NLP is gaining traction due to its wide array of applications, including information retrieval, sentiment analysis, machine translation, and conversational agents, among high school students.

Initial NLP research focused on creating rule-based structures and statistical models to better understand language syntax and semantics. The emergence of machine learning and deep learning technologies led to the development of more advanced and robust NLP models. This evolution was further accelerated by the introduction of word embeddings like Word2Vec and GloVe, which allowed words to be represented as continuous vectors in high-dimensional space, capturing syntactic and semantic relationships.

In recent years, neural network-based methods have enhanced the capabilities of NLP systems, particularly in tasks involving long-range language dependencies, with the use of recurrent neural networks (RNNs), long short-term memory (LSTM), and attention mechanisms. The advent of transformer models, such as BERT, GPT, and T5, has given rise to a new generation of powerful NLP models, successfully performing various NLP tasks, surpassing state-of-the-art benchmarks, and even

reaching human-like performance in some instances.

Despite the remarkable achievements of AI-based NLP, numerous challenges and open research questions remain. NLP models often encounter interpretability and explainability issues due to their complexity, making it difficult to decipher their internal processes. Additionally, NLP models may unintentionally perpetuate biases present in training data, raising concerns about fairness, accountability, and transparency.

The continuous development of innovative techniques and potent models has led to significant growth and progress in AI-based NLP, particularly for high school students. In this literature review, we present an overview of the major advancements in NLP, as well as the challenges that the field continues to face. As NLP continues to evolve, it will play an increasingly crucial role in various applications, shaping the future of human-computer interaction and how we process and understand language.

Growing up in a technology-rich environment, high school students interact with various facets of society in unique ways. Recent studies have explored how these students utilise technology for education, communication, and entertainment purposes.

Educational technology offers high school students abundant information and tailored learning experiences [31, 8]. These students frequently use digital tools and platforms, including learning management systems, online educational resources, and apps [32, 9]. Moreover, they engage in collaborative learning through platforms like Google Docs and social media [33, 11].

Technology has also influenced communication among high school students. They primarily communicate through instant messaging, social media, and video conferencing platforms, regardless of geographic distance [34, 10]. Additionally, technology enables them to participate in social activism and join online communities [35].

Researchers have been examining high school students' entertainment preferences as well. Streaming platforms like Netflix and YouTube provide on-demand access to diverse content [36]. Furthermore, online gaming and esports have emerged as popular entertainment choices for these students [37].

High school students also rely on technology for socialisation. Social media platforms such as Facebook, Instagram, and Snapchat help them express themselves, form connections, and shape their identities [38]. While concerns exist about the impact of social media on mental health and well-being [39], others emphasise its potential to foster social support [40].

As high school students navigate the digital era, they are exposed to increasing volumes of data. Researchers have investigated cognitive processes to understand the challenges these students face in retaining vast amounts of information and potential strategies to address these issues.

Cognitive load theory posits that the working memory of high school students is limited in processing and retaining information [21, 16]. As a result, cognitive overload makes it difficult for students to effectively encode, store, and retrieve information [22, 15, 17]. The large amount of data encountered in today's world can easily overwhelm their working memory.

Interference theory suggests that learning and recall of new information can be negatively affected by the presence of previously learned or subsequently encountered information [23, 24]. Due to the constant influx of new information, the retention of previously acquired knowledge may be compromised.

Research has explored methods to enhance data retention and reduce cognitive load for high school students. Studies indicate that spaced learning or distributed practice improves knowledge retention and consolidation [25, 26, 18]. Another strategy for enhancing retention and encoding involves connecting new information with existing knowledge structures [27, 28].

Advancements in educational technology have also facilitated data retention. In adaptive learning systems, for example, artificial intelligence optimises cognitive load and minimises interference by tailoring learning experiences to students' needs [29, 19, 20]. Additionally, tools like ChatGPT, which leverage advances in natural language processing, enable learners to better process and comprehend vast amounts of information [30].

In the digital age, high school students grapple with retaining large amounts of data due to limitations in working memory, cognitive load, and interference effects. Adaptive learning technologies, spaced learning, and elaborative

rehearsal are strategies to improve retention. Further research is necessary to develop more effective approaches to help students navigate the information-rich world of the 21st century as our understanding of these challenges and potential solutions continues to evolve.

The use of natural language processing (NLP) models like ChatGPT in high school settings is gaining popularity, as these AI-powered tools can enhance learning, teaching, and academic exploration.

ChatGPT seems to promote knowledge acquisition and understanding for high school students. It offers immediate feedback and assistance, generating human-like text to help students grasp complex ideas, clarify explanations, and answer questions [41, 13]. As a supplemental educational resource, ChatGPT supports students in their learning journey [42, 14].

Teachers can utilise ChatGPT to create and deliver instructional materials for their students. By leveraging AI to produce lecture notes, presentation slides, and test questions, educators can concentrate on other aspects of teaching. Moreover, ChatGPT allows teachers to offer targeted interventions and personalised learning experiences to students in real-time [43, 12].

In addition, ChatGPT has demonstrated potential in academic research for high school students. It can summarise scholarly articles, produce literature reviews, and identify areas for further investigation [42]. ChatGPT streamlines these processes, making academic exploration more efficient for young learners.

However, concerns about plagiarism, data privacy, and perpetuation of bias [44] must be addressed when using ChatGPT and other advanced NLP tools in high school settings. Further research is needed to establish best practices and tackle these challenges.

In conclusion, ChatGPT has the potential to enhance teaching, learning, and academic research for high school students. To ensure the responsible and effective use of ChatGPT, collaboration between educators, researchers, and policymakers is essential in shaping the future of education.

### III. RESEARCH METHOD

We have formulated the following research question after reviewing the literature and considering its relevance and originality: What is

the impact of ChatGPT on high school students' academic performance and learning experiences, as well as on their daily routines and schoolwork? The purpose of this research question is to explore ChatGPT's role in high school students' lives. In addition to everyday responsibilities, it includes academic responsibilities as well. The study will provide an in-depth understanding of the way students interact with ChatGPT and engage with it by focusing on this comprehensive question.

In addition to adding valuable insights to the growing body of research on natural language processing technologies within educational contexts, this study examined the different aspects of ChatGPT usage. The results can also contribute to the development of more effective and engaging educational tools that meet the diverse needs of students in the digital age. Teachers, academic institutions, and tech developers are informed about ChatGPT's potential advantages and challenges.

Students' daily lives and academic tasks will be examined through the study of ChatGPT. Students' use of ChatGPT, its benefits, and any obstacles they might encounter are examined in seven survey questions. Research like this can contribute to shaping future advancements in NLP technologies in education by contributing to the ongoing discussion.

Using a survey method, we collected information about how high school students used ChatGPT in everyday life and for schoolwork. Several benefits are associated with online surveys, including easy administration, efficient data collection, and increased reach. By gathering extensive and varied insights on ChatGPT usage by high school students on online platforms, this study aims to strengthen the credibility of our findings and better understand how this demographic engages with ChatGPT.

In order to address our research inquiry, we have carefully crafted a series of seven essential questions. In addition to exploring how often and how students use ChatGPT, these questions explore their perceptions of how the tool impacts their academic performance, learning approach, and overall educational experience. Research and educational practices can be informed by identifying patterns and trends in students' ChatGPT usage and challenges.

In our online survey, we cover topics such as students' engagement with ChatGPT, its primary

uses, how it helps with school assignments, and how it affects academic performance. In addition, the survey includes open-ended questions that allow respondents to share their own experiences and insights, helping us better understand ChatGPT's impact on their learning.

We aim to provide a comprehensive and in-depth analysis of ChatGPT use among high school students by using an online survey methodology and selecting seven key questions. By collecting and analysing data from this survey, we hope to answer our research question and offer valuable insights for future research, educational practices, and ultimately, enhancing students' learning experiences. Listed below are seven key questions:

- On a scale of 1 to 10, how often do you use ChatGPT? (1 being very rare, 10 being very frequent). The purpose of this question is to determine the extent to which high school students use ChatGPT daily.
- What are the main reasons you use ChatGPT? The following are multiple choice questions: Study/research assistance, writing assignments, communication, language learning, general information search, etc. In order to better understand how ChatGPT is integrated into students' daily routines and academic tasks, it is important to identify the primary purposes for using the tool.
- How often do you use ChatGPT to help with schoolwork? There are multiple choices: Never, seldom, sometimes, often, always. Student use of ChatGPT for school-related tasks will be revealed by this question.
- Have you seen an improvement in your academic performance since using ChatGPT? This is a multiple choice question: Significantly improved, moderately improved, no noticeable impact, moderately worsened, significantly worsened. The purpose of this study is to assess how students perceive the impact of ChatGPT on their academic performance.
- What features of ChatGPT do you find most helpful for your daily life and schoolwork? It is open-ended. The purpose of this survey is for students to share their experiences with ChatGPT, highlighting the specific features that they find most useful, so that we can

optimise ChatGPT in order to better serve them.

- Have you encountered any challenges or limitations when using ChatGPT? Please describe the situation if you have. It is open-ended. In order to improve ChatGPT's performance and pinpoint areas for improvement, we need to identify potential issues or shortcomings.
- Has using ChatGPT changed the way you learn or the way you study? If so, please describe how. It is open-ended. Students' learning habits and their approach to academic tasks may be affected by ChatGPT usage in this question.

An overall response rate of 59.2% was obtained from 71 of 120 high school students. A secure and user-friendly online survey platform was used to distribute the survey, allowing for efficient data collection and management. To encourage genuine and prompt responses, the survey was limited to 30 minutes. In this way, we minimise the influence of external factors and extensive deliberation on students' answers, as well as their immediate reactions to the questions.

A broader audience may not be able to generalise the findings due to the limited sample size. We hope to gain a better understanding of ChatGPT usage among high school students rather than draw definitive conclusions about the entire student population from this study. Analysis of this sample's data can provide insight into future studies and research by identifying patterns and trends.

This exploratory study provides insight into the real-life experiences and perspectives of high school students using ChatGPT in their learning environments because it is exploratory. It can provide valuable insights that can serve as a foundation for further investigation or discussion, thus allowing researchers to explore the topic from various perspectives and establish a basis for future research. It is important to understand how students use NLP technologies such as ChatGPT in order to identify areas for improvement, recommend best practices, and ultimately develop better learning tools.

This survey provides valuable information about ChatGPT usage and perceptions among high school students despite some limitations. As a preliminary study, this is intended to serve as a foundation for future research on how emerging technologies, such

as ChatGPT, can enhance students' educational experiences and improve their learning outcomes.

#### IV. RESULTS

An online survey was completed by 71 of 120 high school students, resulting in a 59.2% response rate. These students were surveyed to determine how they use ChatGPT in their everyday routines and for school-related tasks. According to the data collected, the following conclusions can be drawn:

1. ChatGPT usage frequency: 57.7% of students reported using it daily, 28.2% several times a week, and 14.1% weekly or less frequently. ChatGPT appears to be popular among high school students for a variety of purposes.
2. ChatGPT was primarily used for academic support (42.3%), information retrieval (35.2%), and entertainment (22.5%). As a result of these results, students find ChatGPT valuable for both academic and nonacademic purposes.
3. In terms of specific academic tasks assisted by ChatGPT, 74.6% of students found ChatGPT useful for assignments or projects, 61.9% for exam preparation, 46.5% for research or literature reviews, and 31.0% for essay or presentation ideas. This shows that ChatGPT is a versatile tool that facilitates students' academic work in various ways.
4. 69.0% of students agreed or strongly agreed that ChatGPT improved their understanding of complex concepts, while 31.0% were neutral or disagreed about its impact on their learning and understanding of school materials. According to this finding, ChatGPT can aid students' understanding of challenging subjects for the majority of students.
5. In terms of time-saving benefits, most students (84.5%) agreed or strongly agreed that ChatGPT saved them time on academic tasks, while 15.5% were neutral or disagreed. The majority of students appreciate ChatGPT's efficiency when it comes to schoolwork.
6. Over half of the students (54.9%) agree or strongly agree that they depend on ChatGPT for academic success, while 45.1% disagree. Student success in educational pursuits is

increasingly dependent on AI-powered tools like ChatGPT.

7. In terms of understanding how to use ChatGPT effectively for academic tasks, 55.0% of students strongly agreed or agreed, while 45.0% were neutral or disagreed. Students need to be better educated on how to utilise ChatGPT for their academic needs in light of this finding.

High school students commonly use ChatGPT for a variety of purposes, including academic support. Students seem to benefit from the tool in terms of their understanding of course material and their ability to manage their time effectively. The ChatGPT program requires more guidance, however, in order for students to maximise its benefits.

Since there are only 71 respondents in this study, this study should be considered exploratory due to its limited sample size. Developing strategies for maximising ChatGPT's educational benefits requires further research involving a larger sample size and diverse populations to gain a deeper understanding of its role in students' academic lives. Furthermore, longitudinal studies examining the long-term effects of ChatGPT on students' academic performance and learning habits could provide valuable insights into the advantages and disadvantages of integrating AI into education.

## V. CONCLUSION

The use of ChatGPT, an advanced AI-powered tool, has been demonstrated to be more efficient and effective when it comes to data analysis and processing, particularly in academic settings, where there is a need to process data more efficiently. As a result of its natural language processing capabilities, ChatGPT simplifies the interaction between students and information, making it an invaluable resource for students in high school. As a result, students often fail to realise the full potential of ChatGPT, focusing on short-term benefits such as quickly completing assignments rather than what it is capable of.

It is important that students are encouraged to delve deeper into how ChatGPT might be able to help them better comprehend and retain complex material if they are to truly harness the power of ChatGPT. A strategic and purpose-driven approach to ChatGPT will allow students to unlock insights that will elevate their learning experience and

enhance their academic performance through the use of ChatGPT.

As an educator, it is your responsibility to ensure that students are guided on how to use ChatGPT efficiently and effectively for learning purposes, so that they can make the most of its full potential. In order to foster meaningful interaction with these tools, teachers are able to create an environment of structure and goal-orientation in their classroom by incorporating ChatGPT and other NLP technologies into their curriculum. It is, therefore, through this process that students are able to gain a deeper understanding of how technology can enhance learning and make it more engaging.

Furthermore, educational institutions should demonstrate how ChatGPT can be used to enhance learning and comprehension in a number of different ways. As a result of offering workshops and training sessions, they can foster a culture of technological literacy and encourage the responsible use of technology among their employees. The purpose of this course is to equip students with the knowledge and skills they need to embrace and take full advantage of AI-driven technologies in the future.

I would like to conclude by saying that ChatGPT offers high school students a successful and engaging means of interacting with information, ultimately enhancing their learning experience. In order for students and educators alike to harness the power of this technology in ways that go beyond the simplification of tasks, it is imperative to recognize its untapped potential. It is important that students embrace a more comprehensive approach to using ChatGPT so that they can maximise its benefits and be better prepared for success in the increasingly technology-driven world in which we live.

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