

How have Teaching Methods in the English Department in Various LCPS Changed Since ChatGPT has Emerged? (4,254)

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Abstract:- The study is based within Loudoun County Public Schools, focusing on four different high schools English departments: John Champe High School, Lightridge High School, Briar Woods High School, and Freedom High School, and it explores the impact of ChatGPT on teaching methods. To thoroughly investigate the impact of generative artificial intelligence, a two-part survey method was used that combines both multiple-choice questions and free response. This method revealed that digital assignments and hyperfixation on ensuring academic integrity are the common themes amongst English departments in high schools. English teachers expressed decreased trust in students, and a consensus was made that teaching practices were adapted to accommodate for the increase in improper use of technology. Therefore, the study highlights the benefits and challenges of ChatGPT in education, and it emphasizes further research in this area.

I. INTRODUCTION

ChatGPT is a new development created by OpenAI to restructure the way artificial intelligence is used in society. Generative artificial intelligence creates human-like texts using large language models to communicate back and forth, and it learns by interacting with people in the real world. Additionally, it creates a surplus of jobs due to the numerous applications of ChatGPT. In the education industry, this technology can be used to create assignments and lesson plans; however, ChatGPT can create challenges regarding academic dishonesty. The method used to determine how the teaching department has evolved in LCPS is a two-part survey method. This approach allows for an in-depth quantitative and qualitative analysis of content acquired from the results. The initial hypothesis was that the abundance of technology in Loudoun County schools would lead to the implementation of ChatGPT into the English departments; therefore, teachers will create more free responses and creative writing into their assignments. Through thematic analysis, the themes that were identified were that teachers assigned work in class, handwritten assignments, monitored classwork, critical thinking questions, personalized learning, and used ChatGPT constructively to mitigate the usage of ChatGPT. There is a noticeable shift towards digital assignments, and most teachers referenced their lack of trust in students, and there should be more research to gather the opinions of both students and teachers.

II. LITERATURE REVIEW

Technology is constantly evolving, and ChatGPT along with other AI technology leads the change. ChatGPT is cutting-edge technology that has the capacity to create human-like text and engage in conversations. The field of education is one of ChatGPT most influential areas because it has the potential to change teaching methods for the better in the near future. This literature review's goal is to explore current research that is available about ChatGPT's impact on teaching methods and analyze the negative and positive aspects of its impact along with considering the ethical ramifications and opportunities that have arisen.

ChatGPT's presence has been more focused on higher education rather than the lower levels and its impact is more widespread than simple text conversations. Miriam Sullivan, the team leader at Edith Cowan University who has written multiple articles regarding generative AI, researched that educators should learn to take advantage of ChatGPT's benefits because without promoting healthy usage of technology the rate of academic dishonesty increases (7). ChatGPT is known to rapidly respond to the user by using its large data sets; but according to Opara Emmanuel Chinonso, an educational technologist who has written several articles regarding generative artificial intelligence, ChatGPT is known to write incorrect responses in order to fulfill a user's needs and this problem emerges because of bias amongst the data set (38). Due to the imbalance between accuracy and quick response, ChatGPT is prone to making mistakes which plays an instrumental role in the evolving teaching methods in higher education.

ChatGPT creates specific examples and collaborates with students to support them, which is vital to students and it particularly benefits students with learning disabilities. David Baidoo-Anu, a researcher with over ten years of experience in various fields and he conducts experiments at schools to understand teaching practices (58). Considering both the positive aspects and limitations of ChatGPT, the concept of human-AI hybrid education (AIED) is currently being evaluated. Kenneth Holstein, a professor at Carnegie Mellon University in the Human Computer Interaction Institute, researched that hybrid teaching methods combine the strengths of human and AI systems, which is beneficial to each individual student, innovative in educational backgrounds, and it creates unlimited possibilities for everyone (241).

If teachers are willing to adapt to ChatGPT and implement AI into their classrooms, significant challenges such as academic integrity and the lack of understanding the material have to be considered. Some institutes have said that AI has made assignments too easy and it limits critical thinking skills within students (Sullivan 4). According to Joseph DeFazio, a professor who has won several awards for his proficiency in teaching and multimedia projects, researched that writing inspires creativity, problem solving and reflection; writing enables better comprehension, analysis, and synthesis of information, which creates a stronger long-term memory (34). Therefore, the use of AI can diminish the purpose of assignments seeing as the lack of participation within students constricts creativity, therefore the analytical capability of students decreases and it negatively impacts teaching.

ChatGPT technology is severely limited in terms of education because it responds to user requests based on patterns and data. ChatGPT uses large language models (LLMs) to produce data for users. LLMs are trained to create texts that can be communicated to humans by using the data set provided by OpenAI, the company that created ChatGPT (Bukar 1). Additionally, Chinonso researched that as the information is compiled from datasets it can be hindered by bias, which impacts reliability and validity. Paired with the lack of human interaction students' learning experiences are impacted and they are unable to collaborate with other students and teachers, the sole use of AI in education is detrimental to students' education (Baidoo-Anu 56). Educators have to take into consideration the technological limitations that ChatGPT has due to its limited data sets.

Further investigation is needed to determine the consequences of academic dishonesty related to AI generated content in different educational settings. This can determine when students should be introduced to ChatGPT and when teachers should adapt their lessons to AIED learning in order to limit academic dishonesty (Sullivan 7). Additionally, Chung Kwan Lo communicates that action should be taken to conduct more research considering the detection and preventative measures against plagiarism to preserve academic honesty in schools (12). Optimizing AI to accommodate learning disabilities is important to create an inclusive environment in school systems; consequently, it is a vital field of research that is necessary before implementing AIED teaching (Baidoo-Anu 59). Baidoo-Anu raises important questions about how AIED learning can be implemented into school systems and if teachers need training to achieve this goal (59).

In conclusion, the integration of ChatGPT into educational systems creates unlimited possibilities for learning. While there are countless benefits, there are multiple challenges to overcome. The positive impact of ChatGPT is substantial but it's not able to support those with learning disabilities and it fosters concerns about academic integrity. To create a positive learning environment human and AI education has been used in order to maintain the fundamentals of education and implement

the use of technology. According to the research, hybrid systems are being researched to maximize the benefits of technology and education while promoting student teacher interaction. However, the ethical ramifications of using AI in educational systems while preserving academic integrity is challenging. The incorporation of ChatGPT into schools depends on whether a solution is found for ethical challenges, a balanced use of AI, and ongoing research regarding inclusivity and effective teaching for students. ChatGPT impacts teaching because it challenges educators to create an environment where student learning is enhanced and integrity is upheld.

III. METHODOLOGY

A. Survey Design

This study explores the effects ChatGPT has on the way that various LCPS English departments teach. The goal is to discover more effective teaching strategies by comparing multiple schools within LCPS which is vital to the development of the education field as artificial intelligence technology becomes more accessible.

B. Research Approval

During AP Research, the project plan was submitted to the Institutional Review Board (IRB). In order to be approved by the institutional review board a research study needs to be deemed ethical. I had to revise my project plan by editing the survey and using less biased terms when referencing the ChatGPT "outbreak". Additionally, I had to emphasize that only teachers will be surveyed and not students. After two revisions, I gained approval from the institutional review board and I started my research.

C. Participant Selection and Distribution

The participants in the survey will be found in LCPS: LHS, JCHS, BWHS, and FHS. The subjects of the study are English teachers; no gender or racial restrictions, ensuring a diverse representation of perspectives. To distribute the survey, the heads of the English department in four various schools will be contacted via email and it will be distributed throughout the department.

D. Participant Consent

The target audience does not consist of minors so parental consent is not necessary. Therefore, the survey will ask for consent from adults prior to participation. The experiment will be conducted through google forms, which will take roughly two to three minutes to complete. Only teachers will be surveyed, since they are not minors they will give consent prior to beginning the survey. If consent is not given then the survey will conclude and no data will be provided.

E. Two Part Survey

The method used to determine how the teaching department has evolved in LCPS is a two part survey method. This approach allows for an in depth quantitative and qualitative analysis of content acquired from the results. This survey was adapted from Abdulhadi Shoufan, an associate professor of electrical engineering and published

numerous research papers about cognitive learning and artificial intelligence, research about exploring student's perceptions of ChatGPT through a thematic analysis. The two part survey consists of both a set of both multiple choice

and free response questions, which captures details that only one method of research could not have gathered (Figure One).

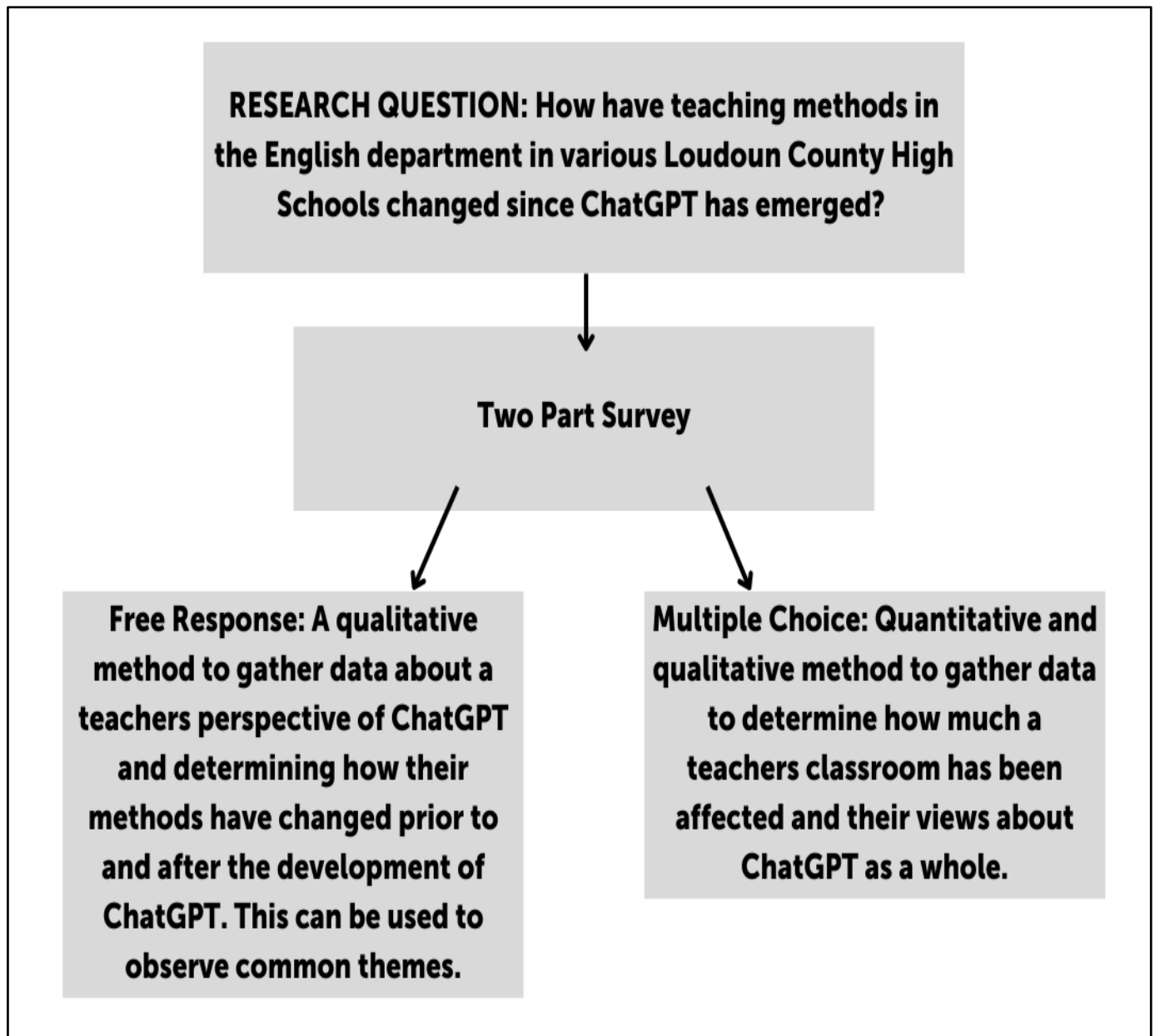


Fig 1: Two Part Survey Method

A. Free Response Section

The first part of the survey is the free response section to determine how teachers methods have developed as ChatGPT by establishing how they taught their class prior to and after the COVID-19 pandemic. The free response section allows the teachers to express their thoughts without limitations and subsequently a thematic analysis approach will be used to categorize responses and understand teachers' perception of ChatGPT.

B. Multiple Choice Section

Multiple choice questions, the second part, will consist of five questions and teachers will be required to select if they agree or disagree to the question by using a five point scale (agree, somewhat agree, neutral, somewhat disagree, and disagree) (Figure Two). The pre-existing research consists mostly of analysis of students' usage of ChatGPT and how teachers have noticed an increase in academic dishonesty. This technique combines the five point scale that Shoufan developed with the implementation of extra free response questions to gather a comprehensive understanding of the effects.

Figure 2A:

PT1: ChatGPT is better than other search engines like Google!

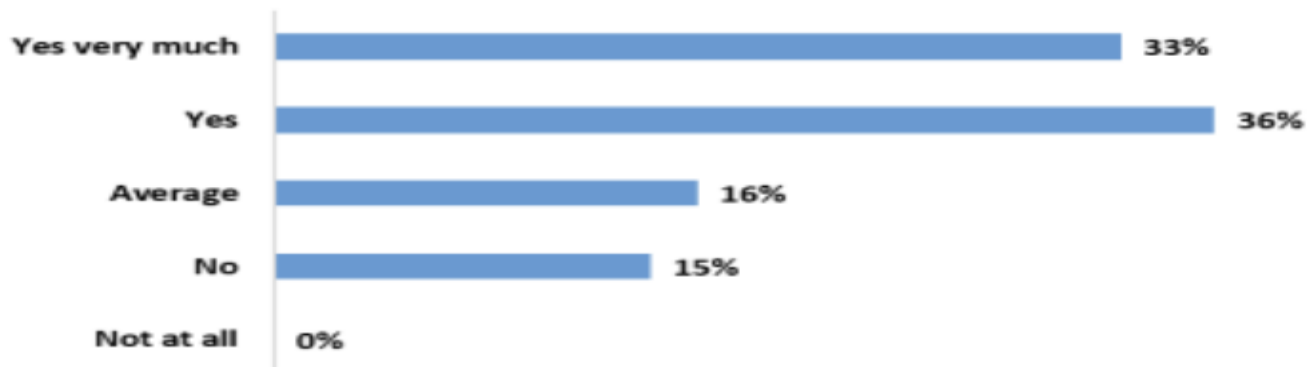


Figure 2B:

Do you think ChatGPT has a positive effect on education? *

- ☐ Agree
- ☐ Somewhat Agree
- ☐ Neutral
- ☐ Somewhat Disagree
- ☐ Disagree

Fig 2: Examples of Question Formatting. Figure 2A is a Demonstration of Shoufan’s Research and Figure 2B is an Example of his Technique in Relation to this Study

C. Analysis of Survey

To analyze the free response section of the two-part survey, thematic analysis will be used to determine patterns and themes related to the evolution of teaching methods as ChatGPT is utilized frequently. The purpose of the exploration is to identify diverse perspectives and insights that English teachers in LCPS have in order to establish more effective teaching methods by reducing academic dishonesty and identifying the solution. In the multiple choice section, quantitative analysis will be used through a five-point scale which will determine trends and potential correlations within teachers' responses in different schools. The synthesis of both qualitative and quantitative data will result in a comprehensive understanding of the effects of ChatGPT on teaching methods in LCPS which ensures a holistic perspective, aligning with the goals of the study to determine effective strategies that can be used in the presence of artificial intelligence technology.

IV. DATA ANALYSIS

A. Free Response Section

The data collected from the free response portion of the survey was uploaded into Google Sheets to organize and identify the various patterns and diverse perspectives of the teachers regarding the impact of ChatGPT on their teaching methods. By utilizing thematic analysis, the responses sent by teachers are categorized based off of recurring themes which allows for a deeper understanding of the subtle nuances and unique viewpoints. Implementing the use of Google Sheets will simplify the process of identifying the variations within data and responses from teachers and it sheds light on the “adaptations” of teaching methods over time in LCPS.

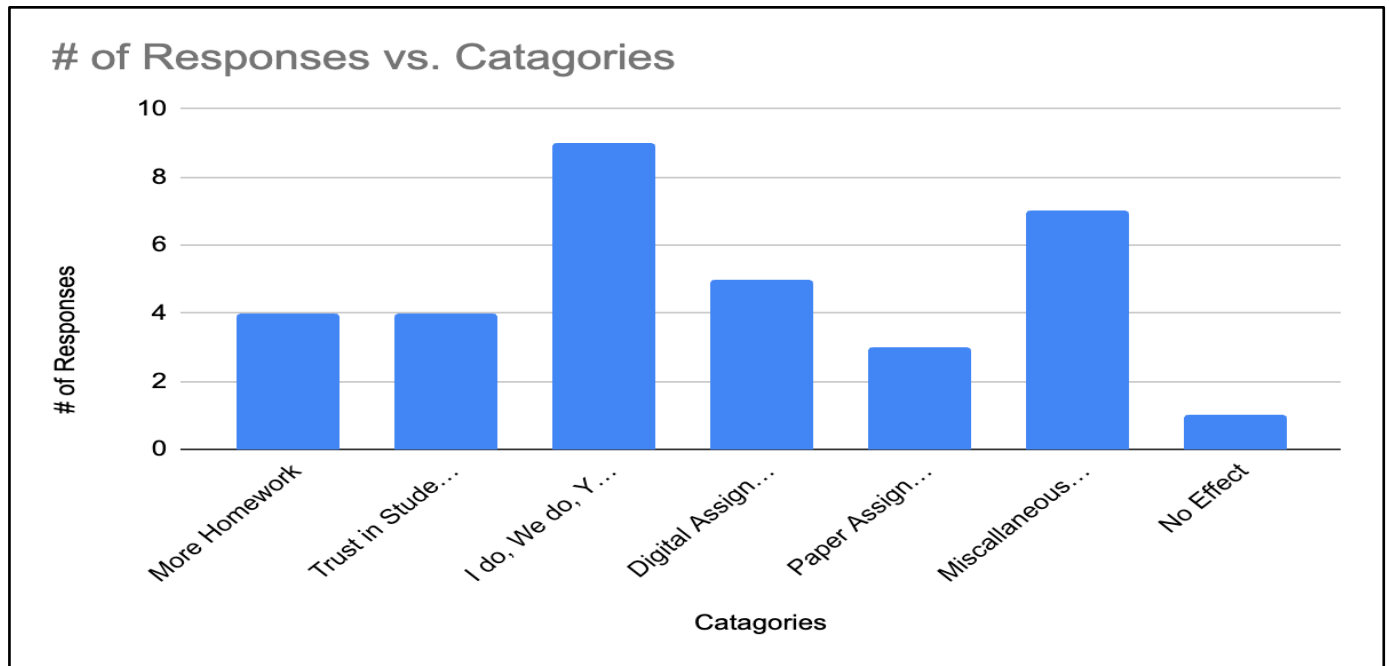


Fig 3: The Number of Responses and Themes Identified from Free Response Question One - What were your Teaching Methods Prior to Widespread Usage of ChatGPT and after the COVID-19 Outbreak? (May 2021 - November 2022)

From the twenty-eight responses, there were at least six underlying themes: more homework, trust in students, I do, we do, you do modeling or standard teaching model,

digital assignments, paper assignments, miscellaneous responses, and no effect.

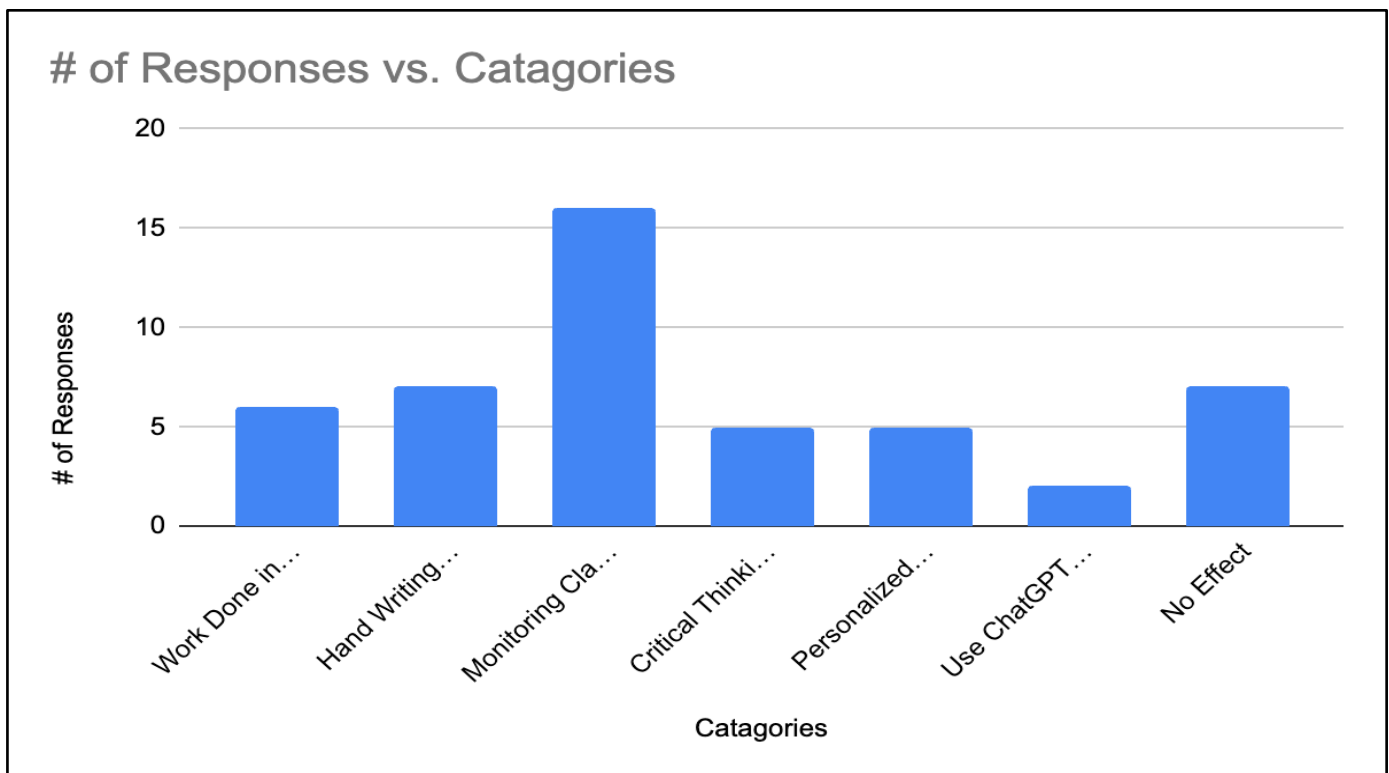


Fig 4: The Number of Responses and Themes Identified from Free Response Question Two - How have your Teaching Methods Changed Since the Widespread Usage of ChatGPT? What Works the Best for you?

The themes that were identified from the second free response questions were work done in class, handwritten assignments, monitoring classwork, critical thinking

questions, personalized learning, using ChatGPT constructively, and no effect.

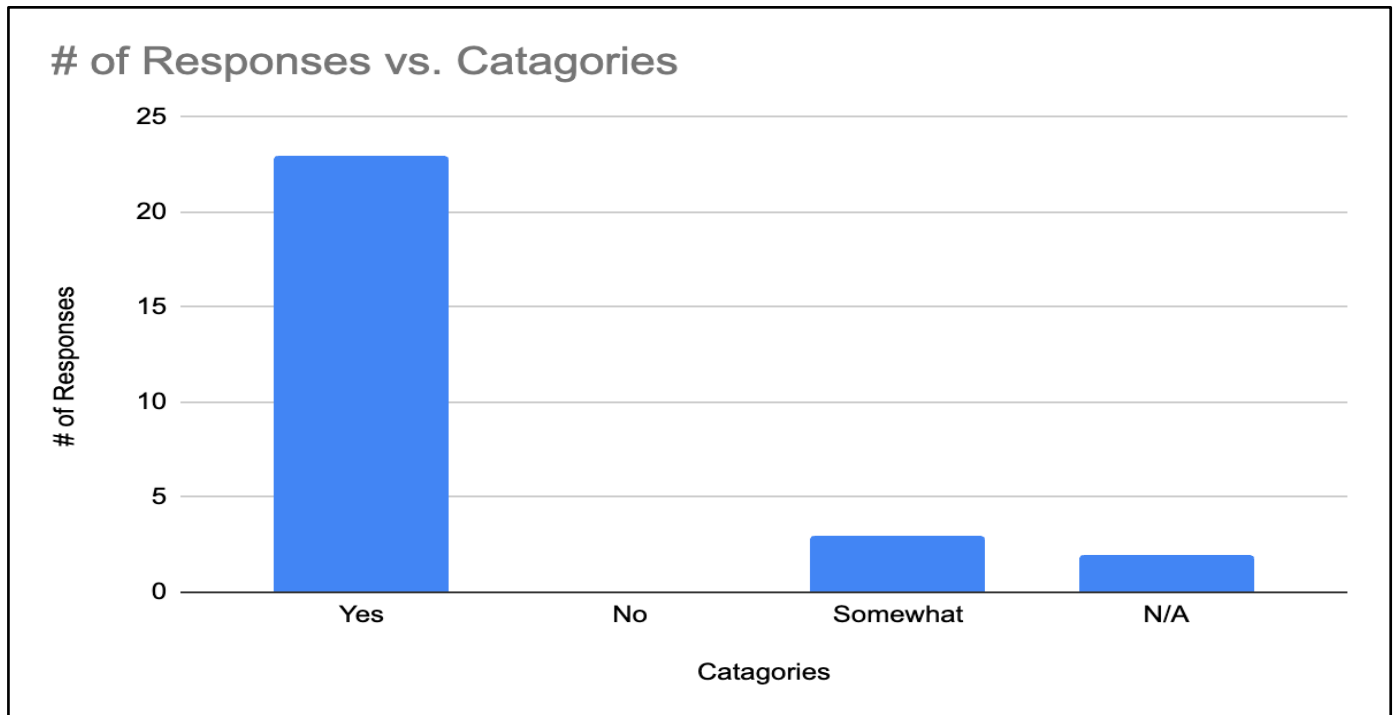


Fig 5: The Number of Responses and Themes Identified from Free Response Question Three - Has Cheating using ChatGPT been a Problem in your Class? How Many Times have your Students been Caught Cheating using ChatGPT?

This free response question prompted more of a yes or no answer, so within my data I analyzed the general amount of times teachers have caught students cheating. Based on the teachers who responded “yes,” the average number of students caught cheating from ChatGPT specifically is roughly ten students.

B. Multiple Choice Section

The data that was collected from the survey was collected on a five point scale response method to create a standardized method for collection in the quantitative analysis. This method ensures that the teachers taking the survey can indicate their levels of agreement to the statement because the answer choices range from “agree” to “disagree.” Additionally, this response method creates an efficient, productive, and organized data set to identify trends within responses.

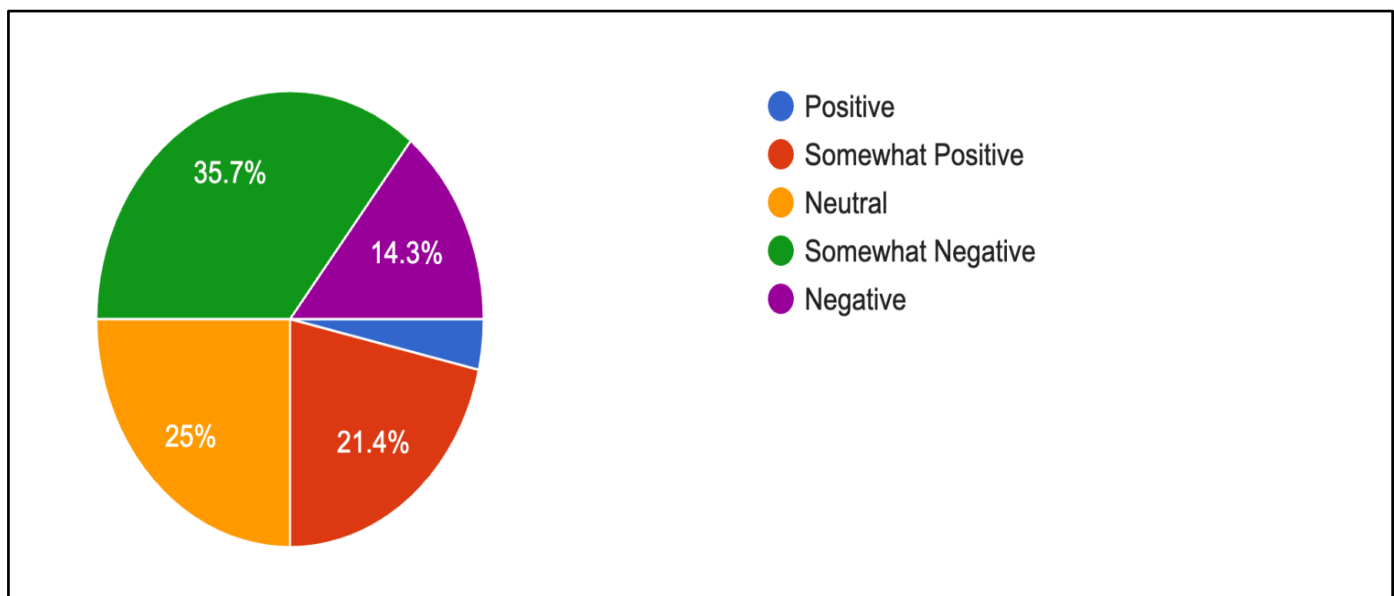


Fig 6: What Do You Think of ChatGPT? Multiple Choice Question One

Most English teachers in LCPS high schools have a somewhat negative perception of ChatGPT, but twenty five percent of teachers have a somewhat positive outlook.

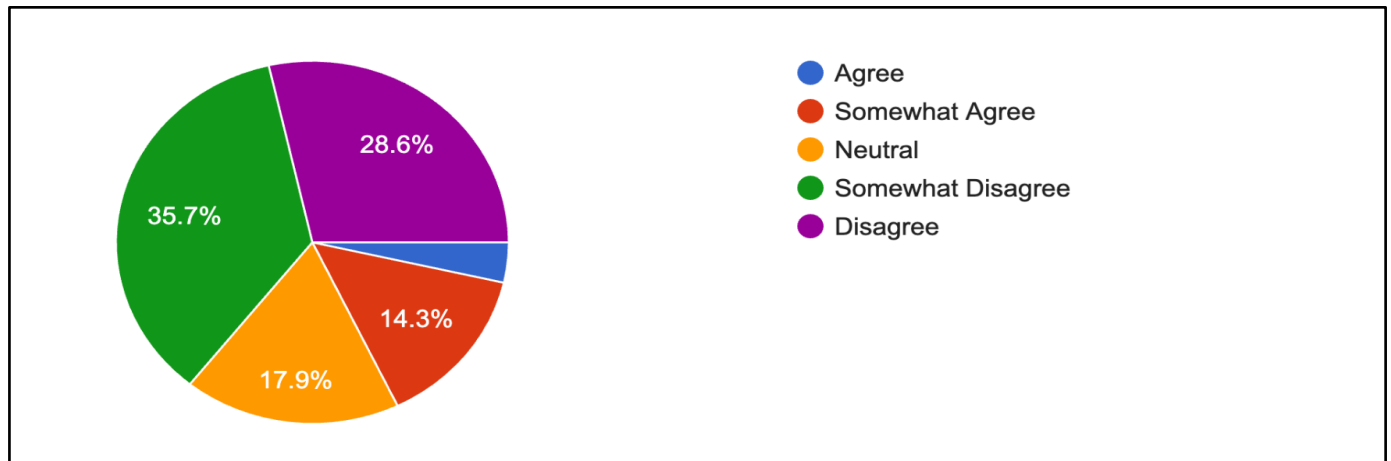


Fig 7: Do you Think ChatGPT has a Positive Effect on Education? Multiple Choice Question Two

Regarding the figure above, teachers in LCPS seem to think that ChatGPT has a negative effect on education. More than half of the target audience expressed that they disagree

with the statement “ChatGPT has a positive effect on education.”

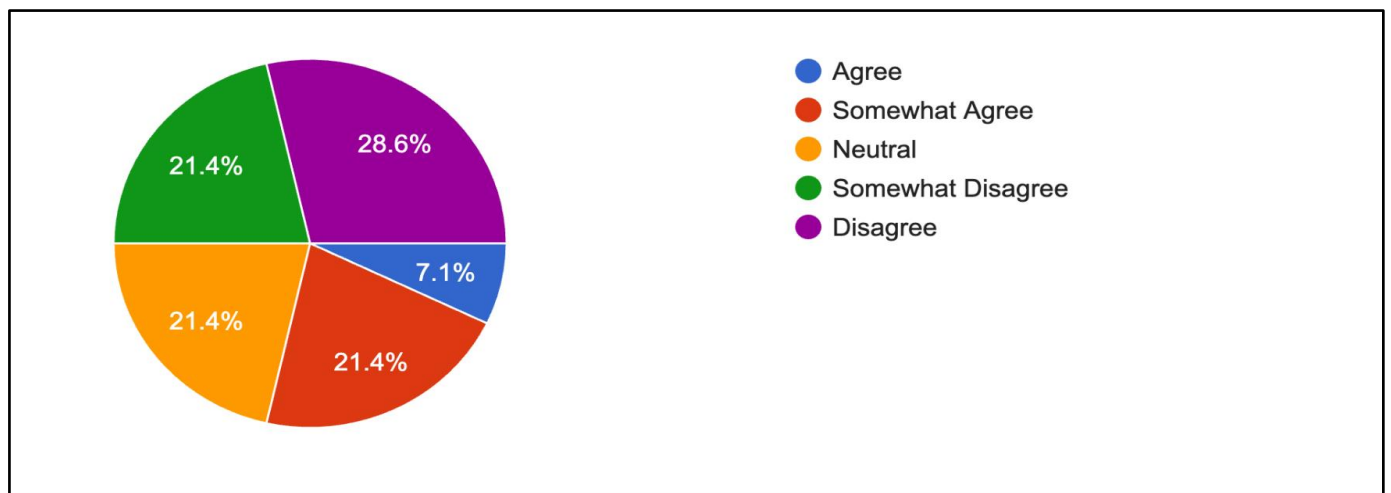


Fig 8: Do you Think ChatGPT is Useful to Guide Students in Learning? Multiple Choice Question Three

Fifty percent of English teachers think that ChatGPT is not useful to students and it does not guide them as they try to learn, while about twenty one percent stayed neutral and twenty eight percent agreed with the statement.

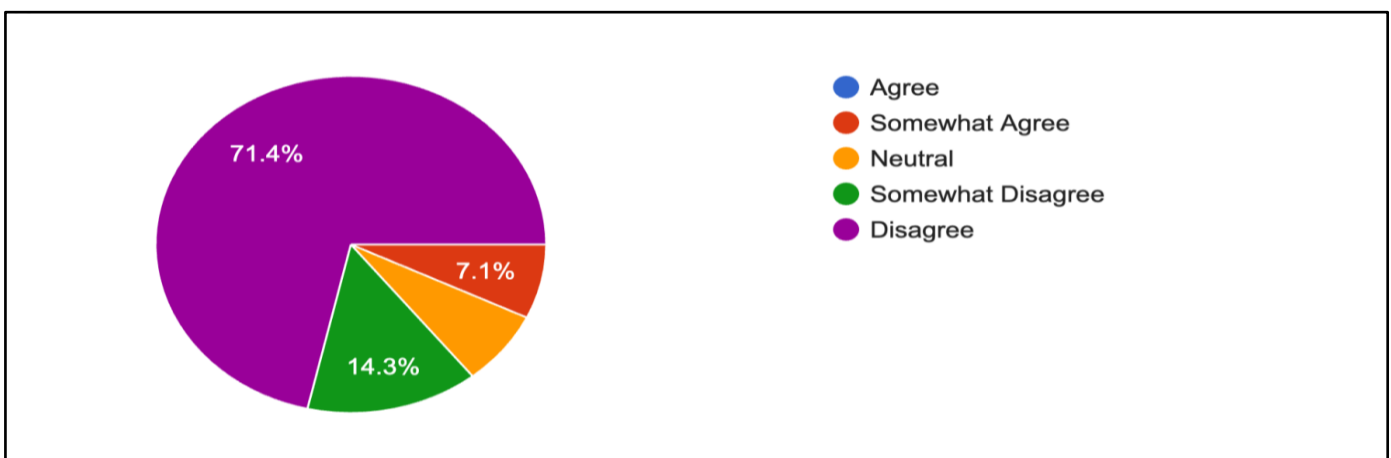


Fig 9: ChatGPT is Necessary for Learning. Multiple Choice Question Four

Seventy one percent of the participants in this survey disagreed with the statement that ChatGPT is necessary for learning and seven percent of teachers agreed with the statement.

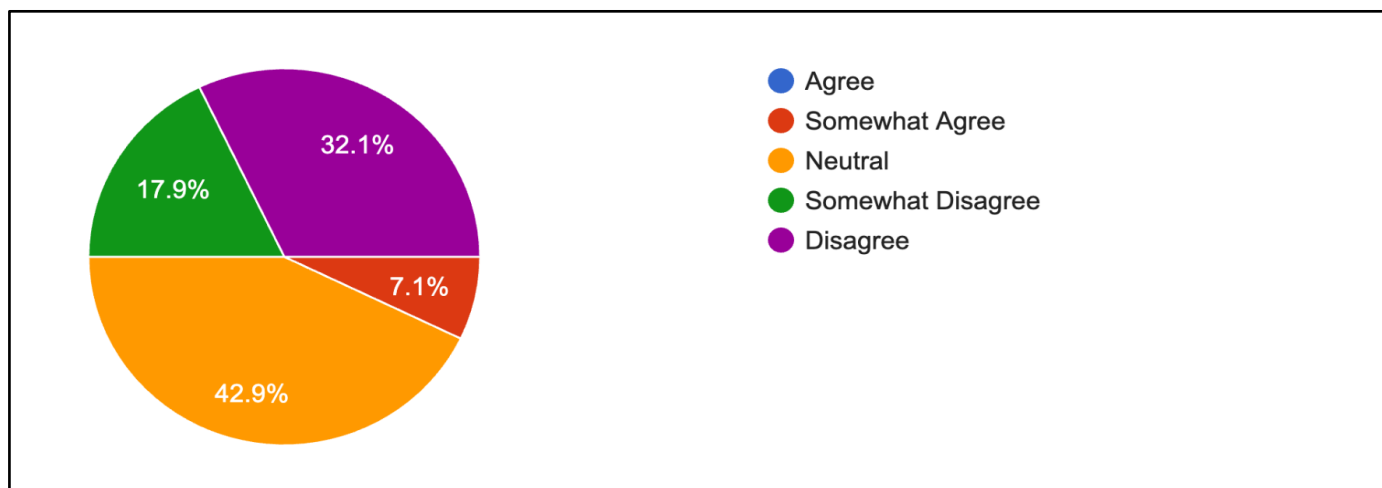


Fig 10: ChatGPT is Effective in Teaching. Multiple Choice Question Five

Most English teachers in LCPS high schools remained neutral when asked if ChatGPT is effective, but thirty two percent of the participants disagreed.

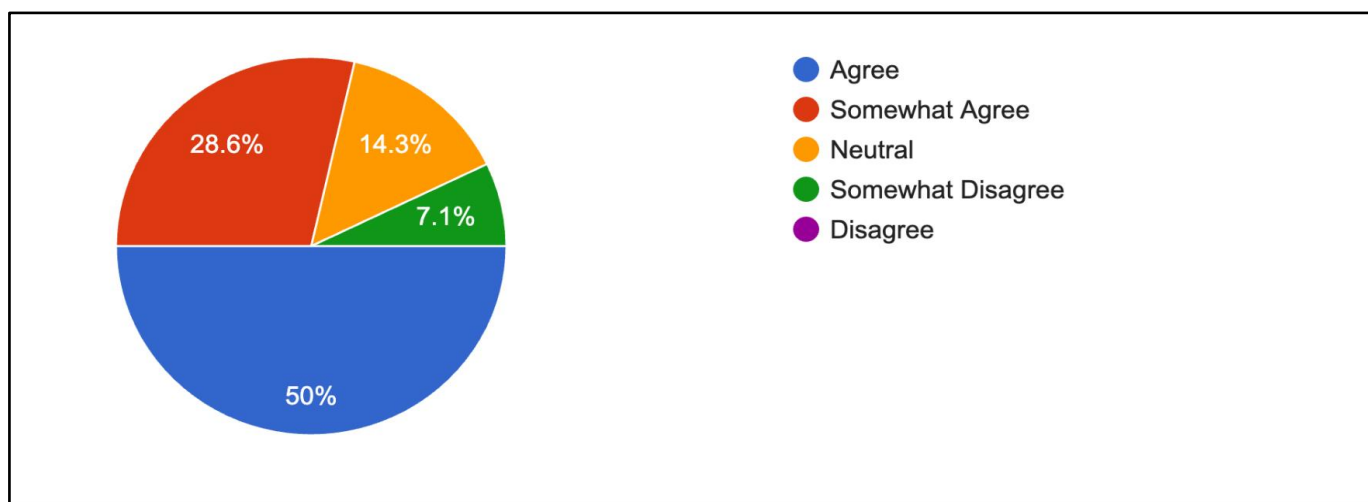


Fig 11: Do you Think ChatGPT Affects your Teaching Methods? Multiple Choice Question Six

When teachers were presented with the final question, fifty percent of the participants agreed that ChatGPT affects their teaching methods while nobody strongly disagreed with this statement.

V. DISCUSSION OF RESULTS

The survey indicates that teaching methods are influenced by the emergence of ChatGPT, both the free response questions and multiple choice questions suggests that there was a shift towards more digital assignments and teachers expressed a decrease in their trust in students. As shown in Figure 11, there is a mixture of responses although fifty percent of the teachers "agree" that ChatGPT affects their methods, 14.3% of the teachers are neutral, and no teachers disagree fully. These results are further proven in the thematic analysis portion of the research as well because 75% of all teachers indicate that there is a change of their methods, while 25% report that they did not change their methods.

The survey indicates that ChatGPT has a significant influence on teaching methods in English departments of LCPS high schools. Prior to COVID-19 teachers used a combination of various methods, but most used the "I do, We do, You, Do" method, which was the foundation of teaching practices (Figure 3). "I do" is the time during the instructional period where the teacher "does," "we do" is a group example, and "you do" is independent work done by the student as homework.

However, as the widespread use of ChatGPT occurred, teachers have been turning away from this method and numerous teachers have been adapting paper and pencil classwork in addition to building in class time for students to complete their assignments. This adjustment was made to mitigate the increase in academic dishonesty. Additionally, teachers have indicated that they have not found a concrete solution to the issue, but they are attempting to determine what the best method to detect and prevent cheating is.

Currently, the most common method to achieve this goal is to utilize ChatGPT to create and adjust assignments, create a personalized aspect of the assignment, provide class time to start the assignment, and use artificial intelligence checkers such as turnitin and draftback to catch students who are dishonest.

VI. LIMITATIONS

While this study provides insight into various teaching methods that have been developed within LCPS English departments, however, there were several limitations that negatively affected the data collection process. The most difficult part of the study was gathering data to analyze because the target audience is limited. It consists of fifty two English teachers across four different LCPS and the sample size made it difficult to gather responses from teachers. Since the target audience is a relatively small group of people it cannot generalize the findings of a larger population of English teachers and it may not represent every individual's diverse perspective.

Another limitation was the method that was used for distributing the surveys, email. Despite efforts to reach out to the appropriate audience by sending three emails a week, the rate of response from the emails was low. Some teachers expressed their frustration with the constant emails, so I had to stop distributing surveys due to the increased volume of negative emails that were received. This reluctance to participate could have skewed the data collection and enabled teachers to respond quickly instead of providing detailed responses that represent their true perspective on the study.

Furthermore, schools did not update the teacher contact list provided on their website which created a significant challenge because there was no way to compile an exact list of staff members in the English department of each school. This could have led to improper distribution of the survey to teachers who are not employed or switched schools. In addition, some teachers may not have received the survey due to the improper contact list. Therefore, the small sample size, low response rate, lack of participation, and inaccurate information affected the results of the study and prompted improvement in future research.

VII. IMPLICATIONS

This study affects numerous people beyond LCPS English departments because it provides insight regarding the implications for teachers, administrators, students, and the technological field as a whole.

Educators should adapt to the ever changing environment that provides a healthy balance between upholding academic integrity and utilizing the benefits that artificial intelligence technology provides. Additionally, as teachers are shifting to digital assignments they need to encourage students to use technology properly and implement plagiarism and artificial intelligence detection tools to combat teachers' decrease in trust.

Administrators can refer to the findings of this study and create policies and regulations that teachers in LCPS must adhere to. Additionally, admins can create better methods to detect artificial intelligence usage and create environments where educators can be equipped with the skills necessary to combat the usage of ChatGPT in high school. So, teachers can be given better resources to detect artificial intelligence and the administrators in LCPS high schools can place more effective guidelines to create an environment where students benefit from using technology and uphold academic integrity standards.

The technological field should create methods for teachers to check for artificial intelligence usage throughout the company itself. They can create artificial intelligence tools that can guide educators and accommodate to the challenges they face due to the development of ChatGPT. Administrators, educators, and technology developers can form a cohesive group and create solutions to the unique set of issues that teachers are faced with together to create efficiency and enhance student learning.

Students can benefit from a well-rounded education, so they can learn about the risk of bias and artificial intelligence integration into every aspect of their lives. When students learn in an engaging environment that promotes innovation it enhances their understanding of the material taught. The environment in which students learn is vital because teachers need to cater to individual students' learning and adapting to the use of technology will provide this necessity to students. So, my study provides clarity about the best method used by educators in LCPS English departments.

VIII. CONCLUSION

Emerging artificial intelligence technologies such as ChatGPT present challenges for teachers employed in various English departments at four different LCPS. This study's goal is to understand the diverse perspectives of teachers as the educational field changes and shifts to adapt to artificial intelligence technologies. The teachers' perspectives were studied through a two part survey by utilizing free response questions and five point multiple choice questions. By conducting the survey in two parts, valuable insight was gathered concerning the effects of ChatGPT on teaching methods.

The free response and multiple choice questions demonstrate that there is a noticeable shift towards digital assignments and most teachers referenced their lack of trust in students. Thematic analysis was used to understand varying perspectives from teachers' free response answers; 75% of teachers indicated that there was a change in their methods of teaching and the other 25% determined that there was no change (Figure Five). But, 20% of the teachers who said there was no effect explained that they do not want to spend their time "policing" students. However, the multiple choice revealed that 50% of the teachers affected their teaching methods, but 14.3% stayed neutral (Figure Eleven). These findings highlight the challenges and

opportunities that educators face when faced with the complex problems regarding the synthesis of artificial intelligence and teaching methods.

Thematic analysis from the free response section was used to determine the nuanced nature of the issue that teachers are faced with. While most teachers acknowledge a change in their teaching methods, a few teachers do not. The most common method to combat the increase in artificial intelligence is to implement personalized free response questions along with extra class time to promote learning. Surprisingly, a minority of teachers are uninterested in changing their teaching methods and they refuse to monitor students' classwork and homework. In the multiple choice section, the majority of teachers admitted that ChatGPT caused their methods to shift, but almost half remained neutral. Therefore, both sections of the survey detail the same results that while there may be a shift many teachers do not want to spend their time “policing” students to uphold academic honesty standards.

IX. FUTURE RESEARCH

To further understand the impact that ChatGPT has on teaching methods further research must be conducted to determine the long term effects of integrating technology into classrooms, the ethical implications of artificial intelligence, and to understand why teachers are unwilling to change their methods to enhance student learning outcomes.

If AIED learning is implemented into teaching the long term effects of the constant use of technology needs to be recorded. A long term study can help administrators and educators determine the best method of teaching to promote learning outcomes, classroom retention rates, and academic success. This will provide insight about the effectiveness that ChatGPT has on the educational field and development of the students.

The ethical implications of implementing artificial technologies such as ChatGPT into educational settings must be addressed to combat bias that is present in the datasets that artificial technologies use to run. Further research can benefit teachers because it is vital to determine and develop an ethical way to “cite” an artificial intelligence algorithm to promote transparency and accountability in classwork.

Additionally, future research can clarify and investigate why certain teachers remain neutral and refuse to change their teaching practices to accommodate artificial intelligence technology. If administrators understand why teachers do not want to spend their time “policing” students they can implement rules, incentives, and regulations that influence teachers to facilitate the implementation of technology in LCPS English Departments and beyond.

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