

**Using AI for Writing Instruction for English Learners**

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*A Master's Paper*

*Submitted in Partial Fulfillment of  
the Requirements for the Degree of*

Masters of Arts - Teaching English to Speakers of  
Other Languages



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5/28/2024

Date

University of Wisconsin-River Falls

2024

## **Abstract**

The use of AI in education has been a pressing topic across academia worldwide ever since the creation of ChatGPT back in 2022. Some institutions are shying away from allowing students to use AI, while others are still undecided on how to utilize AI in education. This paper researches if AI use in EL (English Learner) writing instruction has merit, and if so, what is the proper way to introduce it to ELLs (English Language Learner). Currently, there is minimal evidence suggesting that instructors can definitively prove if students are using AI to write papers. Additionally, AI usage is set to expand exponentially; therefore, it is paramount that instructors teach students how to use AI as a learning tool. Without guidance from an instructor, students may misuse AI to write for them instead of using it as a learning tool.

In this paper, I will provide justification for the use of AI in EL writing instruction, while also describing the various pitfalls that students fall into while misusing AI. The usage of AI is justified through a detailed literature review of AI programs that: (a) support instructors, (b) provide students with instant feedback, and (c) utilize AI's generative capabilities. After examining these AI options, the paper will conclude with a demonstration lesson plan that describes how an instructor could integrate AI in an intermediate ELL class. The objective of this research is not only to inform instructors about the possibilities of AI and how it can support students' writing, but also to provide support for instructors by examining the time-saving generative mechanisms of AI.

### Acknowledgements

I would like to give special thanks to Dr. Douglas Margolis for being my advisor throughout this process. Dr. Margolis provided me with crucial feedback, and I could not have finished this paper without his guidance. I would also like to thank Dr. Eunjee Jang and Dr. Satomi Shinde for being on my defense committee.

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## 1. Introduction

To enroll in a university, students must be proficient in writing mechanics. Academic writing represents one of the most intricate yet essential stages in mastering a new language. It involves navigating sentence structure, grammar, vocabulary, paragraph organization, and various other linguistic aspects. Essentially, writing serves as the culmination of all the language skills an individual has mastered. With that said, the difficulty of the writing process is compounded when a student needs to do it in their L2 (second language). On average, 10.3% of students attending public schools in the United States are identified as English Language Learners (National Center for Education Statistics, 2023). 1 out of every 10 students enrolled in the United States public education system faces this added language obstacle. To better support these students, instructors need strategies for breaking down the barriers to academic writing that ELL students face.

Although AI in education is currently in its infancy, it has the power to facilitate learner autonomy and help ELLs overcome the complexities of written language. However, many students are using AI without guidance, so it is unlikely that these students are fully utilizing AI as a learning tool. Notably, AI technology is only becoming more relevant and there is not a reliable way to detect AI-assisted writing. Else (2023) recently conducted a study aimed to assess how well AI could distinguish abstracts written by ChatGPT compared to those authored by scientists. Intriguingly, both the scientists and the AI detection program produced similar results: the scientists identified 68% of ChatGPT-generated abstracts, while the AI detection program pinpointed 66%

(Else, 2023). These disparities are expected to increase in the years ahead due to ChatGPT's linguistic capabilities constant evolution as it gathers input from the vast network of approximately 5.3 billion internet users worldwide (Shewale, 2024).

Therefore, instructors have an opportunity to get in front of this trend and learn how to incorporate AI to facilitate language growth within their ELLs. Not only can AI facilitate language growth for students, but it can also provide time-saving techniques for instructors. Because of AI's ability to empower students and instructors, the purpose of this paper is twofold:

1. To inform instructors how they can utilize AI to improve their ELL students' writing.
2. To support instructors by decreasing burnout in the profession with time-saving measures from AI programs.

These goals will be accomplished by identifying the primary reason students are using AI and incorporating that information to provide rationale for AI use in writing instruction. After providing rationale, a literature review of the effectiveness of writing feedback from AI to ELLs will be conducted to inform instructors of AI options and how to avoid AI misuse. The conclusion of this paper will culminate with a demonstration lesson plan emphasizing how an instructor can incorporate AI in a writing lesson to lessen their workload, while also teaching students how to utilize AI as a learning tool.

### **1.1 Challenges ELL Students Face with Academic Writing**

Academic writing is seen as an intensive task because it is a multifaceted activity: an ELL (English Language Learner) student will need to weave and exhaust their entire knowledge of the English language to showcase their writing abilities. First,

the majority of ELLs usually have not attained the proper amount of vocabulary, which is around 18,000 word families (Nation, 2001). Without the foundational base that a typical L1 speaker has, ELL students can find it challenging to represent their research and ideas earnestly when tasked with writing. According to research conducted by Misbah, Mohammad, Yunus, and Ya'acob (2017), not having the same vocabulary base as a native speaker causes breakdowns in academic writing. ELL students have difficulty writing coherent papers when their vocabulary knowledge remains limited (Misbah et al., 2017). Research time and time again has proven that vocabulary is one of the most essential facets of being a proficient academic writer (Rohayati, 2014).

In addition to vocabulary limitations, ELLs also grapple with mastering the intricacies of English grammar, further compounding the challenges they face in academic writing. Grammar can be broken down into two primary categories: (a) syntax, which pertains to the arrangement of words, and (b) morphology, which concerns the structure of words (Spencer, 2000). Gedion, Tati, and Peter (2016) analyzed the syntactical errors of ELL students and found that vocabulary-based errors ranked as the most common, closely followed by grammatical errors. Moreover, their research found that ELLs faced significant challenges in punctuation (Gedion et al., 2016). So, ELLs confront roadblocks not only in trying to broaden their vocabularies to express their ideas, but also by the syntactical challenge of putting a sentence together correctly.

The complexity of academic writing creates multiple roadblocks for many ELLs, not only due to linguistic elements such as grammar and vocabulary but also due to similar challenges native speakers face regarding conventions of writing like pragmatic choices, tone, cohesion, and the like. These features of writing, however, get slighted

when students are bogged down by vocabulary, grammar, and punctuation mechanics. Given the vast array of moving parts involved, expecting instructors to catch and explain every error made by ELL students is unrealistic. However, providing timely and targeted feedback is indispensable in supporting ELL students' writing development. Timely feedback plays a major part in preventing recurring errors from solidifying into habits. The writing feedback serves as a vital tool for guiding students in identifying and facilitating growth in areas of weakness. However, the sheer volume of feedback needed can overwhelm instructors, necessitating the need for AI.

## **1.2 Rationale for Using AI in the Classroom**

AI is a powerful tool that can also facilitate learner autonomy. There was once a time when instructors told students, “You have to learn how to do math without a calculator because you will not always have one in your pocket.” That statement continues to age poorer with each passing year. I use this adage because AI is on the brink of becoming the modern-day calculator. Students will have access to it wherever they are because phones are easily accessible. These programs are powerful learning devices when instructors teach their students how to properly use them. They have the potential to provide students with instantaneous writing feedback. Yousofi (2022) argues that students continue to show eagerness to use AI to assess their writing. Since students are becoming more engaged in technology and AI, it is important for instructors to help support and foster that excitement by demonstrating ways they can use AI to enhance their learner autonomy.

A major reason students want to use AI is to help them gather information and organize ideas. AI can provide ELLs ideas on: 1. what type of information they should



include in an essay 2. where to find sources, and 3. how to summarize them. The lesson unit in this paper demonstrates these actions by incorporating ChatGPT into the writing process to help students organize their outlines for their persuasive essays. Additionally, the demo unit uses Genei to summarize academic sources that may be considered too difficult for ELLs to comprehend completely. AI assistance in this circumstance was used to help students get past roadblocks by having AI generate ideas to write about it, while also breaking down language barriers ELLs are confronted with in scholarly articles.

A second reason for adopting AI tools is that students are increasingly recognizing the potential benefits of AI and expressing a desire to use its capabilities effectively. A recent study conducted by Dakakani & Safa (2023) in an L2 classroom revealed that a substantial 89.4% of students expressed interest in using AI for tasks such as summarizing, paraphrasing, and structuring their writing. Intriguingly, the study also highlighted a contrast in the attitudes of instructors, who tended to be more skeptical of AI. However, it was noted that many instructors expressed a willingness to accept AI more positively if provided with additional training opportunities (Dakakani & Safa, 2023). A separate study by Garrote Jurado, Pettersson & Zwierewicz (2023) found that 57% of students in classrooms had not yet engaged with AI, while 43% had some level of exposure to it. However, the majority of students in the study agreed that they were interested in using some form of AI assistance for educational purposes (Garrote Jurado et al., 2023). These results imply that, despite the interest among students, a significant portion of the student population has yet to explore AI applications for use in their education. Put all together, these findings demonstrate there

is growing enthusiasm among students to utilize AI into their academic tasks. However, a substantial number of students nationwide have yet to experience the potential benefits of AI, proving there is room for increased adoption and exploration in educational settings. With that said, ELL instructors have an excellent opportunity to introduce AI to their students and teach them how to successfully integrate it into their writing process responsibly.

A third reason for adopting AI is to help support instructors. Currently, public school instructors are tasked with providing feedback to a large sum of students, lesson planning, contacting parents, classroom management, ILPs (individualized language plans), grading, material creation, and more. AI can alleviate some of these stressors by having the ability to provide instantaneous feedback to students. While the feedback AI provides is less in-depth than that provided by an instructor, it still holds value in identifying surface-level errors. In the demo unit section of this paper, students use ChatGPT to collect feedback from their outline. After receiving feedback from ChatGPT, they trade their paper with a peer who will also provide feedback. The student will then compare the ChatGPT feedback and peer feedback. This type of activity provides a reprieve for instructors because: (a) their students receive instant feedback, (b) the students receive handcrafted feedback from a human, and (c) the students will see the type of feedback they receive from a human is different from AI, so they can learn to utilize both when writing.

Lastly, the importance of being comfortable using AI extends beyond academic success—it's also crucial for preparing students for future careers. A recent study conducted by Gallup and Amazon Web Services and summarized by Sklar (2023)

emphasizes this significance, revealing that 76% of businesses in the Asia Pacific region prioritize digital skills over traditional college degrees. Specifically, employers value digital certificates demonstrating competency in digital technologies, recognizing these potential employees as being more adept for the evolving workplace (Sklar, 2023). Digital proficiency, being an employable trait, correlates with the growing relevance of AI use in the business world. Half of all businesses currently utilize AI technologies in some capacity, showcasing the widespread adoption of AI into various workplaces (Bilan, 2023). Given this trend, proficiency in AI tools like ChatGPT becomes increasingly valuable for job seekers, as familiarity with such technologies can provide students with a competitive advantage in getting hired over other similarly qualified candidates.

### **1.3 Definition of AI**

In order to understand AI and its benefits, there needs to be a clear definition of what it is. The academic community, however, does not currently have a unified definition of the term. A recent study by Collins, Dennehy, Conboy, and Mikalef (2021) was conducted with the sole purpose of addressing this issue by cross-examining multiple sources to create a definitive definition of AI. Ultimately, the study found 28 unique definitions, each differing significantly from one another (Collins et al., 2021). The lack of agreement and diversity of definitions creates an issue for researchers in the field of AI, making it difficult to determine the generalizability of findings and exactly what findings are relevant to specific contexts, such as writing instruction (Collins et al., 2021). Because of the confusion around the term, let's first attempt to clarify how AI is defined within the context of this paper.

To begin, Xu et al. (2021) defines AI as the emulation of human intelligence by a system or machine. The goal of AI is to mimic human behaviors which includes the following: (a) having the ability to understand information, (b) planning tasks autonomously, (c) making predictions based on past data, and (d) learning from past experiences (Xu et al., 2021). Mimicking human behaviors is achieved primarily through techniques such as language processing and machine learning, which is a process defined as computing systems learning from past data and using algorithms to finish actions without being programmed to specifically finish the performed task (Mendonca et al., 2023). Ultimately, AI systems are able to complete advanced actions similar to human comprehension while also acquiring knowledge similar to how humans acquire knowledge. AI methodology attempts to copy cognitive intelligence observed in humans, which, in turn, allows the AI to evolve and improve over time (Xu et al., 2021). On one hand, this definition of AI is broad; on the other hand, the definition puts a focal point on the main requirement of AI, which is to be able to simulate knowledge acquisition in order to be classified as such. This definition helps clarify what is considered AI throughout this paper by emphasizing the need for AI tools to be able to adapt to user input.

To narrow down the definition further, this paper will include a summarized European Commission's definition of AI, which states the following: AI is a tool capable of displaying intelligent behavior by analyzing its environment and completing actions on its own (Gesley, 2021). In principle, this definition clarifies that AI should have the ability to complete tasks on its own based on input it has received. However, It's important to note that while AI is expected to operate without direct human interaction, it doesn't

necessarily mean that an AI program must perform all tasks associated with human-like intelligence autonomously (Sheikh, Prins, Schrijvers, 2023). If a tool or program can complete one task autonomously, it can still be considered AI.

Creating a well-defined definition for a term that was originally created in the 1950s before AI became as intricate as it currently seems to be an incredibly difficult task. Nevertheless, for the purpose of this paper, we will use the following characteristics to define AI:

1. A program that tries to mimic human cognitive intelligence by continuously enhancing its abilities through the use of newly gained information;
2. Capable of autonomously completing tasks by utilizing past information from its environment.

It's worth noting that this definition could change as AI continues to develop rapidly in the academic world (Emmert-Streib, Yli-Harja, Dehmer, 2020). Attempting to restrict AI to a single definition may prove unrealistic in the future. However, for the purpose of this paper, these two characteristics will serve as the basis for evaluating AI tools associated with education.

## **2. Uses of AI for Writing Instruction**

AI has revolutionized writing instruction for ELLs. AI provides instructors with a variety of tools and programs to increase learning and creativity within their students. The variety of uses AI can provide for education are nearly limitless, but this section will narrow the scope and focus on three key growth areas for AI in education: (a) automated writing feedback, (b) generative text, and (c) tools to support teaching. If an

instructor can master how to use AI within these three domains, they will be giving their students a major advantage over students who do not receive instruction on how to properly use AI.

## **2.1 Corrective Feedback**

Providing prompt feedback for students after they turn in a writing sample is critical for developing writing proficiency. When providing feedback, having the ability to tailor feedback to accommodate for different learning styles is especially important; while some students excel with direct feedback, others may prefer a more indirect approach. Fortunately, the integration of AI in education has made it significantly easier to provide both types of feedback without putting a large burden on instructors. AI tools have the ability to analyze students' written work then offer guidance for corrections. Additionally, AI can notify users of habitual problems and help them avoid making these same errors routinely. Because there is not a definitive feedback style that is most effective for all ELLs, it is important for instructors to be able to adjust feedback approaches to accommodate different learning styles. While traditionally conscientious teachers expend prodigious amounts of time to address feedback needs, AI provides a means for ensuring students have access to feedback without great demand on teachers' time, which means more time for lesson planning and other instructional needs.

To begin, Ferris (2023) distinguishes that direct feedback, which involves explicitly marking errors made by a student and providing information on how to correct them, also needs to have a meta-linguistic component. Meta-linguistic explanation means that the feedback provider informs students of applicable grammar rules related

to an error. In contrast, indirect feedback identifies where errors exist but requires the student to discover on their own why their error is considered incorrect and how it should be changed. For example, an instructor might circle a pattern of mistakes made by a student and have the students identify the errors themselves and suggest ways to fix the errors. The great thing about AI is that it can review student writing and address errors either directly or indirectly, depending on the student's desire.

Truscott (1996) questioned the benefits of corrective grammar feedback in academic writing, suggesting that such feedback for ELLs was of minimal value. However, it is important to recognize that Truscott's study, while influential, never had the benefit of being able to determine the benefits of using AI with grammar feedback. Recent literature has taken a different stance, with studies providing more nuanced insights into effective feedback strategies for ELL students. Bitchener, Young, and Cameron (2005) for example, investigated the types of error feedback that proved most beneficial for improving ELL students' writing skills, concluding that full explicit feedback was particularly effective. Building on this support for explicit face-to-face feedback, Cao et al. (2022) concluded that direct one-to-one writing feedback interaction created the largest language growth within the domain of writing. AI excels at providing student's individualized explicit feedback, making it a valuable tool that both instructors and students can utilize. These studies make a case for explicit direct feedback, however, they do not tell the whole story.

Eslami's (2014) study provides a compelling counterpoint to the belief that direct corrective feedback for ELLs is most effective. Eslami followed ELL students' progress when receiving indirect versus direct corrective writing feedback and found that the

group receiving indirect feedback showed significantly greater improvement compared to those receiving explicit feedback. When compared with other studies examining feedback strategies for ELL students (such as those by Bitchener, Young, & Cameron 2005, and Cao et al., 2022), Eslami's findings contradict them. Eslami's research demonstrates the difficulty of providing feedback to ELLs. While direct feedback may provide clarity, indirect feedback may promote greater learner autonomy, engagement with the writing process, and language growth and development.

With that being said, research conducted by Ahmadi et al. (2012) suggests that both direct and indirect feedback provided to ELLs can be beneficial. Different student populations may respond differently to each type of feedback, with some preferring direct feedback while others prefer indirect feedback (Ahmadi et al., 2012). Despite these contradictory findings in the literature, one thing is clear: instructors need multiple approaches to cater to diverse learning styles. In combination with the type of feedback, another critical aspect of providing feedback is the timing of its delivery.

Recently, Siddiqui (2023) has demonstrated that students who received immediate feedback on their writing show improvement rates of over 20% compared to those who received delayed feedback. The promptness of feedback is an issue that presents a serious challenge to teachers burdened with high numbers of students and the normal workload of class preps, meetings, and administrative tasks. AI can alleviate the difficulty of instructors providing prompt initial feedback. Students can receive feedback instantaneously using AI-assisted tools while their instructors work on providing more personalized feedback on cohesion and cohesiveness. Receiving



feedback instantly from AI not only helps students with the writing process but also provides additional time for instructor feedback.

Fortunately, AI writing programs can provide prompt feedback both directly and indirectly. For example, AI can identify grammatical mistakes, such as subject-verb agreement or punctuation errors, and offer direct feedback to students instantly. Additionally, these programs can provide meta-linguistic explanations, explaining grammar rules or language patterns directly to the student. In contrast, indirect feedback focuses on having students think about identified errors and attempt to fix the errors by themselves. AI programs can notice patterns of mistakes across multiple submissions, helping students identify errors made consistently and provide guidance for improvement. For instance, if a student consistently misuses a verb tense, an AI program will notify the user of this pattern and lead the student to resources where they can review how to avoid misusing the verb tense. Because AI can provide both direct and indirect feedback, it can offer support tailored to the individual needs of students. Overall, ELLs seem to benefit most when provided with prompt and individualized feedback, which AI tools offer.

## **2.2 Generative AI**

AI holds an unlimited amount of potential in generating text to support ELLs. Generative text tools powered by AI can provide a variety of generated resources tailored to ELL students' proficiency levels and learning needs. There are a variety of use cases for generated text, but this paper is going to focus on some of the more relevant uses in 2024. As previously mentioned, AI is adapting and changing daily, so in the future, this list could look completely different. These practices are designed to help

instructors develop ideas on how they can use generative AI with their students. These tools can offer the following:

**A. Language Practice:** AI-generated text can provide ELL students with an expansive amount of opportunities to practice their language skills. For instance, interactive exercises, dialogues, and scenarios created by AI can simulate real-life interactions for students, allowing them to enhance their vocabulary, grammar, and comprehension skills in a realistic environment. AI tools like ChatGPT and Duolingo, for example, can simulate chatting and other language interactions. Chatting online with an AI gives the students a low-pressure environment to practice their written English. These simulated opportunities can boost student confidence to start interacting with native English speakers.

**B. Writing Support:** AI generative text tools can assist ELL students in not only feedback, but also overcoming writer's block and developing their writing skills. AI can create writing prompts, story starters, and sentence structures tailored to students' proficiency levels; these generative tools provide scaffolding for students to express themselves confidently in English. Many students struggle with sentence starters, transitional words, and coming up with varied sentence structures. AI can generate new ideas for all of these areas. During the unit plan section of this paper, students use generative AI to assist them with brainstorming various sentence starters and transitions. This technique enhances the students' English vocabularies, allowing them to be more creative when writing.

**C. Vocabulary Expansion:** AI-assisted text can also provide ELLs with a wide range of vocabulary and language structures. Through contextualized examples, word

banks, and sentence completion exercises, AI tools help expand students' vocabulary and understanding of situational language use. Improvement in these areas facilitates growth in their overall language proficiency. This can be done in a varying amount of ways; for example, an AI program, like ChatGPT, can analyze a student's writing level and give them vocabulary recommendations based on their writing level. Similarly, AI tools can develop synonyms or word associations based on a student's current writing level. Along with providing appropriate synonyms and word associations for a student's current English proficiency level, AI can also create sentences that are at an appropriate lexile level for the learner while integrating a few words that are unfamiliar to them. The student can then guess the meaning of the unfamiliar terms through contextual clues. These opportunities provide students a pathway to closing the vocabulary gap they may have compared to their first language-speaking peers.

Overall, the use of AI for generative text has the potential to support students' language acquisition and proficiency development. By providing adaptive language practice, writing support, and opportunities for vocabulary expansion, AI generative text tools can assist students in overcoming the complexities of written language.

### **2.3 Lessening Workload on Instructors**

Perhaps one of the most important functions of AI in terms of supporting instructors and helping them be more effective is its capacity to help teachers do more in less time. Instructors are aware of the importance of providing written feedback to students due to its importance to writing instruction. However, providing written feedback is a time-consuming task (Mamoon-AI-Bashir, Kabir, & Rahman, 2016). Instructors are tasked with a multitude of stressful responsibilities, including lesson

planning, behavior management, curriculum creation, and more. All of these demands on instructors put them in a stressful position. The strain on instructors has been felt in the academic world. A recent study conducted by Herman, Hickmon-Rosa, and Reinke (2017) revealed that an astonishing 93% of teachers were experiencing a high level of stress, and that was before the pandemic. This heightened stress level places teachers at an increased risk of physical and mental health problems (Herman et al., 2017). This challenging environment has real repercussions, with 55% of teachers currently thinking about leaving the profession earlier than expected, as reported by the National Education Association (Walker, 2022). The prevalence of stress and its impact on teacher well-being and job satisfaction is a perfect justification for AI and its ability to lessen the burdens on instructors.

Because AI can identify grammatical errors more efficiently than a human, instructors could utilize AI programs to find surface-level mistakes in students' work. Using technology to provide feedback quickly allows instructors to make better use of their time. Instructors can spend more time analyzing deeper issues in their students' writing. Instead of mainly focusing on grammar-related issues, an instructor could focus on the coherence and cohesiveness of a writing sample. Not only does this reduce instructor workload, but it also increases student motivation, a key component in the feedback process. Students are more motivated to make improvements when provided with feedback that is "clear, direct, and information-loaded," as mentioned by Leng (2014). This coordinated approach between using AI and instructor feedback creates a more efficient feedback loop - Instructors save time, and students receive better feedback. It also allows the instructor to have more time available for students who have

follow-up questions (such as when a student knows there is an error but does not understand why it is incorrect).

Additionally, AI can save time when creating materials for writing instruction. AI tools can help create engaging and effective lessons tailored to individual students' needs while also assisting educators in generating a variety of instructional materials, including writing prompts, worksheets, lesson plans, and assessment rubrics. AI tools use a language processing algorithm to analyze writing samples and educational content input from the user. The language processing then takes away key concepts, such as themes and language patterns, to focus on when creating materials. Based on input given to the AI, the program can then generate writing prompts that are appropriate for students' proficiency levels and learning objectives. By taking advantage of these capabilities, instructors can ease the burden of material creation, saving time and effort while still providing personalized writing instruction.

### **3. Effectiveness of AI**

Numerous researchers are in the beginning stages of research regarding AI use in education, particularly focusing on its effectiveness with ELLs (see, for example, Xiao & Zhi, 2023; Wei, 2023; Nova, 2018). The majority of the current literature about this topic has been published within the last couple of years, more specifically, spanning the years 2022 to 2023. Using AI for feedback and material creation is relatively new and provides a unique advantage due to the studies being recent, so the information about the use of AI in education is up-to-date and relevant. However, the relative newness of the field is a double-edged sword. Due to researchers only recently conducting studies

about AI, there is a limited pool of long-term data to draw from. While the current research provides a snapshot of the immediate impact and effectiveness of AI in ELL education, the lack of long-term data hinders a total comprehensive understanding of the sustained benefits or potential challenges that may arise in the future (Cardona et al., 2023).

### **3.1 Corrective Feedback Effectiveness**

Ling Wei from Chongqing University in China conducted a study in 2023 to evaluate the effectiveness of AI in writing instruction for ELLs. The study had 60 EFL students who were at an intermediate English proficiency level. The participants were divided into two groups: a control group of 30 students receiving traditional language instruction, and an experimental group receiving AI-assisted instruction (Wei, 2023). The study took place over 10 weeks, during which both groups were encouraged to study autonomously two hours outside the classroom. The control group received traditional writing instruction such as grammar drills, reading passages, and various writing activities. Conversely, the experimental group underwent activities similar to those of the control group but with the integration of AI. More specifically, the experimental group used Duolingo, a program that tailors vocabulary and writing samples according to each student's English proficiency (Wei, 2023). Both groups were guided by a teacher throughout the study.

Before and after the study, students took pre-tests and post-tests to assess their English proficiency in the four language domains: reading, writing, speaking, and listening. The findings showed that students in the experimental group outperformed their counterparts in the control group across each category (Wei, 2023). Additionally,

the experimental group displayed higher motivation to continue learning and reported having a higher learner autonomy compared to the control group (Wei, 2023). Wei's study showcases that AI-assisted writing instruction can provide two main benefits to ELL students: (a) accelerated academic improvement, and (b) heightened motivation to learn autonomously.

Furthermore, Marzuki, Widiati, Rusdin, Darwin, and Indrawati (2023) organized a study to gather feedback from ELL and EFL instructors. The study interviewed four instructors, each having a minimum of three years of teaching experience and at least one year of incorporating AI into their daily classroom procedures (Marzuki et al., 2023). The researchers' goal was to understand the instructors' viewpoints on the integration of AI in language instruction and its relation to student success in their classrooms by asking a series of questions. The instructors, according to the researchers, concluded that students experienced increased success in the classroom due to AI's ability to tailor materials to individual students' needs (Marzuki et al., 2023). Furthermore, the study emphasized that a diverse usage of AI within the classroom setting was one of the largest factors in student success (Marzuki et al., 2023). It was noted that beyond improving students' grammatical skills, AI also played a significant role in facilitating paragraph structure and organization (Marzuki et al., 2023). Studies from the perspectives of experienced ESL/EFL instructors are incredibly important because they are the deliverers of instruction to students, so it is encouraging that all of these instructors affirmed the positive impact of AI on students' academic success.

In connection, a study was conducted by Fan (2023) that involved 67 EFL students in China: 30 in the experimental group and 37 in the control group. These

students were enrolled in a semester-long course led by an experienced professor with a PhD and over 19 years of teaching experience. The students met for 1.5 hours twice a week in a university course designed for low-level English learners (Fan, 2023).

Throughout the semester, the experimental group received automated AI written feedback from Grammarly in addition to feedback from the instructor (Fan, 2023). On the other hand, the control group received feedback solely from the professor (Fan, 2023). Students were assessed based on four different writing prompts assigned during the semester.

Contrary to expectations, the study concluded that the experimental group did not show improvement in their writing compared to the control group (Fan, 2023). The students in the experimental group reported two main issues with Grammarly: firstly, the feedback was determined to be too challenging for low-level learners, and secondly, students struggled using the platform due to being unfamiliar with it (Fan, 2023). These findings strengthen the argument that automated written feedback may not always be suitable for low-level English learners. Despite the potential effectiveness of such tools, Fan's study serves as a reminder that it is important to consider the proficiency levels of ELLs. If proficiency level is not taken into consideration, students may not benefit from AI feedback. Also, this study notes the importance of teaching students how to navigate AI platforms.

Another experiment by Thi and Nikolov (2022) delved into the impact of using Grammarly for automated written feedback in conjunction with instructor feedback. The study involved 30 participants, aged around 17-18, who were intermediate-level ELLs. The instructor leading the study had an MA in Teaching English to Speakers of Other



Languages and had been teaching for 9 years (Thi & Nikolov, 2022). The researchers compared the feedback provided by Grammarly to the feedback given by the instructor. The study's findings concluded that Grammarly, for the most part, offered surface-level feedback, whereas the instructor provided deeper and more meaningful feedback (Thi & Nikolov, 2022). The participants were able to successfully revise their errors based on the combination of both sets of feedback.

The study's conclusion focused on the potential of AI, such as Grammarly, in offering corrective feedback on surface-level errors. Since correcting surface-level errors is a major strength of AI at the moment, students can receive feedback promptly. With AI providing instant feedback on surface-level errors, instructors will have more time to give each one of their students more meaningful feedback. Therefore, using both AI and human instruction in the feedback process creates an interwoven approach, focusing on the strengths of both AI and human feedback to positively impact the feedback process for ELLs (Thi & Nikolov, 2022).

A recent research project by Escalante, Pack, and Barrett (2023) investigated how different types of feedback impact students' writing improvement. The study was composed of three different groups: one receiving feedback solely from AI (ChatGPT-4), another receiving a combination of AI and a tutor's feedback, and a third group exclusively receiving feedback from a tutor (Escalante et al., 2023). The results concluded that each group exhibited similar levels of improvement in their writing skills. More notably, the study revealed that 50% of the students preferred feedback from AI because of the straightforwardness and clarity of the feedback, while the remaining 50% favored face-to-face interaction with a tutor because they were able to ask follow-up

questions (Escalante et al., 2023). This study provides demonstrable evidence that using AI to provide initial feedback is at least as effective for ELL students as human-provided feedback. However, it also demonstrates that various students prefer having face-to-face interaction with an instructor. Because of these results, it is reasonable to assume that AI should not be the sole form of written feedback for a student. Instructors should allocate time to address follow-up questions from students who need clarification or assistance in understanding the automated AI feedback they receive to cater to all of their students' needs (Escalante et al., 2023).

An overarching trend found in the literature about using AI in writing instruction for ELLs is that AI, by itself, may not be enough. Instead, it is a valuable tool that requires guidance from a capable instructor who is looking to motivate their ELL students. It is clear that students still benefit significantly from instructor feedback. However, AI can play an instrumental role in providing immediate feedback that students can actively work on while instructors provide deeper 1-on-1 feedback to their students. Instructors should aim to collaboratively use AI as a complement, where AI aids in offering quick feedback on surface-level issues, allowing instructors time to concentrate on delivering deep and meaningful feedback. In essence, AI serves as a supportive mechanism, enhancing the overall feedback process and contributing to a more dynamic and efficient learning experience for ELL students.

### **3.2 Generative AI Effectiveness**

The potential of generative AI in education is vast, as highlighted by Lim, Gunasekara, J.L. Pallant, J.I. Pallant, and Pechenkina (2023). They argue that the framework of generative AI holds the key to the future of academic growth, offering

various tools to facilitate students' learning experiences. Specifically, generative AI can be utilized to create pictures, prompts, and tailored content adjusted to individual student levels, providing personalized learning opportunities. However, it's important to acknowledge that while AI is highly efficient at generating materials, its accuracy is not yet perfect. As emphasized in a statement by Sam Altman (founder of ChatGPT), current generative AI systems may provide inaccurate information or even fabricate answers if they encounter unfamiliar prompts (Smith, 2023).

Despite these potential pitfalls, recent studies, such as the one conducted by Kanjee, Crowe, and Rodman (2023), highlight the remarkable progress of generative AI accuracy. Although their study focused on diagnosing cognitive diseases rather than language processing, they demonstrated the potential of AI to analyze vast amounts of data and provide accurate outputs. In their research, AI generated correct cognitive diagnoses 64% of the time based on symptoms provided by researchers, indicating a significant improvement in accuracy from past results. Kanjee and colleagues concluded that these results were highly encouraging and suggested that the accuracy in generative AI is on an upward trend.

While generative AI shows promise in various domains, including education, continued research and development are crucial to further enhance its accuracy and reliability. As the technology evolves, educators and researchers must carefully consider its strengths and limitations to maximize its potential benefits while mitigating risks. For now, it is much safer to use AI for prompts and material creation. Generative AI is not 100% accurate, so it could provide students with false information if they choose to use it for research without taking the time to analyze scholarly sources.

### 3.3 Supporting Instructors Effectiveness

Although generative AI can have its pitfalls, it is fantastic for material creation. In the provided unit plan at the end of this paper, I have generated 4 of my worksheets via AI - Appendix A, B, C, and E are all generated through AI. One of the benefits of generative material creation is that an instructor can have AI create a basic outline of the assignment and alter it themselves after creation. This saves an enormous amount of time while maintaining the same level of quality as something completely made by hand. AI can even align each activity that it creates to state or federal academic standards, which can be especially useful when an instructor is undergoing an observation. The following paragraphs will explain how AI was used to create the appendices of A, B, C, and E.

Appendix A is a basic rubric for an outline, and Appendix C is a table of sources the ELL students will be completing during the unit plan. I used MagicSchool AI's multi-step content generator, which can be found on their homepage once a user creates an account. Once the generator is selected, it asks for the following information:

- Grade Level
- Content Type
- Text Length
- Topic, Standard, Objective
- Additional Criteria for the Content (Optional)
- Standards Set to Align to

Once that information is entered, the user will click the generate button. The generator will create the content based on user input. Then, the user will be able to input

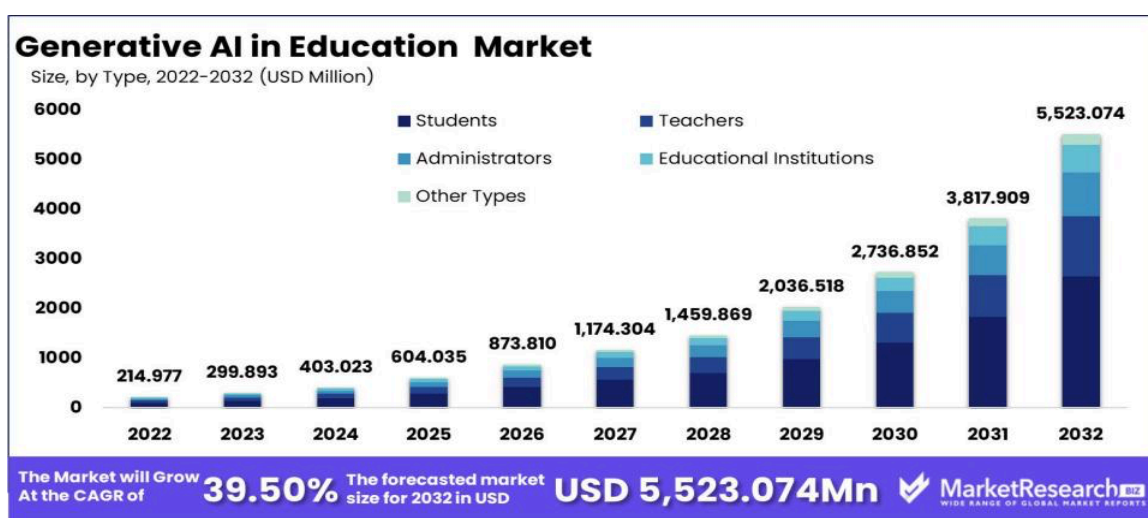
additional commands if they want something changed on the generated assignment. MagicSchool AI will provide the user with objectives, materials needed, key vocabulary, writing prompts, etc. After the user finishes making tweaks, they are then provided with the option of saving the content for future use. Not only does this process save time, but it also allows for differentiation because instructors can print out the same assignment targeted toward different grade levels based on the needs of the class.

Appendix B and E were made similarly to Appendix A and C; however, Appendix B and E utilized different AI programs. Appendix B was made via SemanticScholar's search engine. I simply inputted, "Scholarly sources for the adverse effects of climate change *region*." The program then used its AI engine to refine the search window and find appropriate sources. After the sources were found, SemanticScholar provided locations for them, and I copied and pasted that information onto a Google Doc to create Appendix B. Appendix E was made through ChatGPT's AI system. I entered "Create an assignment that compares and contrasts the differences between AI summaries and human summaries." ChatGPT then created Appendix E. AI processing for the appendices saved time when creating the unit plan while also introducing ideas that I had not thought of.

#### **4. AI Options for Instruction**

AI is evolving at a rapid pace, and new programs are being created daily, leading to an unprecedented rate of adoption in the field of education. The chart below indicates a significant trend of financial investment into AI for education. These projections lead to two key implications: first, AI is here to stay and is not diminishing any time soon, and

second, the development of new AI programs is an ongoing process. As we discuss the relevance of AI, it's important to acknowledge that these trends are dynamic, and the education landscape continues to see advancements in AI programs. Because of this shifting landscape, it is paramount to focus on using AI tools that are reliable. The focal point of this section is the various AI tools that are suitable for student and instructor use.



*Figure 1.* (MarketResearch.biz, 2023) This figure is projecting the amount of USD that will be spent on generative AI in the education market through 2032. The horizontal axis is displaying the projected years and the vertical axis is the amount of USD in millions. The different colors represent who will be spending that money. Student spending is projected to grow the fastest, while teacher spending shows the second-highest growth. This chart demonstrates that USD being spent on AI in education is growing exponentially, so instructors will need to learn how to utilize this tool.

## 4.1 ChatGPT

### Text Generation:

One use of ChatGPT is to generate text, which proves to be a valuable tool for instructors for various reasons. One creative application of text generation is to deliberately have ChatGPT produce a writing sample containing specific issues for students to edit. For instance, I tasked ChatGPT with creating a sample of writing that lacked compound sentences, and it promptly generated the following example:

*The city is big. It has many buildings and cars. People do many things like working and going to the store. There are also parks where people can go and relax. The weather is sometimes hot or cold. People wear clothes accordingly. People eat different kinds of food. They also have different cultures. Overall, the city has a lot of things happening, and many people live there (OpenAI, 2024).*

If an instructor is teaching how to combine sentences to create compound sentences, this writing sample is excellent. It contains various ideas that could be linked together in a compound sentence but are presented as simple sentences in the generated text. This example provides a practical opportunity for students to identify and edit the text, transforming simple sentences into compound ones, which will reinforce their understanding of sentence structure. This type of error correction is similar to indirect feedback since the students find the mistakes and fix them without instructor guidance.

Moreover, giving this task to students in paragraph form supports generalization to their own writing and presents them with a more authentic task than the typical decontextualized sentence combining worksheets. For ELLs, the paragraph supports their understanding of meaning, which allows for their attention capacity to focus on

form. Text generation ideas have been successfully integrated with AI to enhance the vocabularies of ELL students, according to Xiao and Zhi (2023). The utilization of ChatGPT for writing instruction has demonstrated a positive impact on expanding students' lexicons (Xiao & Zhi, 2023). Instructors can create an effective exercise by providing students with a list of commonly used words such as *very*, *good*, *bad*, *happy*, and *big*. Subsequently, students can input these words into ChatGPT to generate a list of synonyms for each term. Following the creation of this list, instructors may instruct students to write a sample that incorporates each synonym at least once. To reinforce this type of learning method, instructors can identify instances where students use common and simplistic words in their writing samples throughout a semester, circle the errors, and prompt students to edit these words using the synonyms they learned through ChatGPT. This approach integrates AI technology into vocabulary expansion exercises by incorporating feedback to foster a diverse vocabulary.

An example of ChatGPT being used for text generation appears during day three of the demonstration unit plan. Students are taught how to use ChatGPT to generate transitional words and sentence stems. The students are introduced to new ways to increase cohesion within their persuasive essays using generative AI. Moreover, students are also taught to use ChatGPT to come up with new ideas if they are stuck. For instance, during the rebuttal section of their persuasive essay, they can enter "Counterclaims to my topic" to encounter arguments against their topic they otherwise would not have thought of. Students in this demonstration unit plan are using generative AI to enhance their writing, not solely relying on it to write for them.



**Editing:**

Campbell and Bautista (2022) recently undertook a research project about the impact of peer editing on EFL students. The study's main finding was that EFL students benefit substantially from editing their peers' papers. This revelation aligns with a similar study conducted by O'Neil, Boyce, and McLarnon in 2020, which also determined that students experience advantages from identifying key grammatical errors in their fellow students' papers. The collective evidence from these studies made one thing clear: peer editing is fantastic for language learning. Engaging in the editing process not only enhances students' understanding of grammatical concepts but can also demonstrate to the students new styles of writing they would have never thought about. Therefore, instructors could use AI to create writing samples that have errors in them. Instructors can choose specific types of errors the AI will make to further emphasize a specific grammar point. The students could then edit these writing samples and receive the benefits of peer editing a paper.

For students struggling with peer editing, they could ask ChatGPT to edit their paper and make suggestions on how to improve it. Recent findings by Steiss, Tate, Graham, Cruz, Hebert, Wang, Moong, Tseng, and Warschauer (2023) have stated that writing feedback provided by AI was nearly identical to the feedback of trained professional instructors. With that said, an instructor could have a student turn in their original draft of a sample of writing. The instructor could then instruct the student to run that sample through ChatGPT and have it make edits. Following the edits, the instructor could require the student to write an analysis explaining why they thought ChatGPT made those edits on their paper. Subsequently, the instructor could carefully review

these comments by the student and schedule a one-on-one conference to ensure that the student comprehended the feedback provided by ChatGPT. This approach could create a constructive learning experience, combining AI assistance with personalized instruction to enhance the student's writing skills through direct feedback. Instructors will save time on initial feedback and can use that time to provide in-depth feedback. Meanwhile, students will receive immediate feedback instead of needing to wait days.

### **Vocabulary:**

Another use of ChatGPT is to translate and provide new vocabulary for students. Recent research findings by Javaid, Haleem, Singh, S. Khan, and I. Khan (2023) demonstrated that ChatGPT can be used to introduce unfamiliar vocabulary words to students. Moreover, ChatGPT can provide synonyms for commonly used lexons and even translate wording into students' L1 to boost vocabulary acquisition (Javaid et al., 2023). When students are using ChatGPT as an AI writing assistant, ChatGPT will consistently use synonyms in place of frequently used words by the students. Students can then infer the meaning of the new vocabulary word based on it being a synonym of a word they are familiar with. Further, if students have diverse vocabularies in their native languages, they can input complex terms in their native tongue on ChatGPT and receive the English terms. Since ChatGPT processes its information from a vast amount of writing, it has a near-limitless potential to assist with vocabulary production.

### **4.2 Grammarly**

Grammarly is a cloud-based writing tool utilized to provide feedback on written content (Grammarly: Free AI Writing Assistance, n.d.). This program has a free and premium version - the free version checks for 150 types of errors, while the premium

(paid) version checks for over 400 types of errors (Nova, 2018). Grammarly harnesses the power of AI and natural language processing to identify errors in two primary categories: language mechanics, encompassing grammar, spelling, and punctuation, and language style, which includes tone, style, and word choice. Due to its ability to use various language processing techniques, Grammarly is able to accurately detect errors in writing (Calma, Cotronei-Baird & Chia, 2022). Grammarly holds the potential to bolster students' learner autonomy by providing them with feedback on coherence, errors, and stylistic elements (O'Neil & Russell, 2019). Furthermore, research indicates that Grammarly serves as an adaptable tool, even being able to cater to the needs of graduate and doctoral students alike (Caveleri & Dianati, 2016). Another advantage of why an instructor may want to use Grammarly is that, unlike ChatGPT, Grammarly has limited text generation abilities - it is primarily an editing tool (Yousofi, 2022). Therefore, it is less likely to provide a student with misinformation.

Students in a study conducted by Nova (2018) have reported success in implementing Grammarly as a form of peer editing. Nova's (2018) study interviewed and analyzed Grammarly feedback from three Indonesian students studying English in a graduate program. The students in this study cited various reasons in their interviews why this tool is powerful for editing papers (Nova, 2018). For instance, once the program detected a mistake made by a student, it provided the student with direct feedback by offering various other examples of the same mistake in different contexts and offered suggestions on how to fix it (Nova, 2018). Students can apply this direct feedback and learn how to avoid similar errors in the future. Additionally, the students claimed that Grammarly often provides briefer and more direct feedback than

instructors, making the feedback easier to internalize (Nova, 2018). The program's ability to color-code errors based on their category has also proven incredibly helpful in clarifying why the error was considered incorrect (Nova, 2018). For surface-level errors it can be beneficial for students to receive briefer feedback, since they do not need a drawn-out explanation for simple mistakes. Excessive amounts of explanation could negatively impact the understanding of the error. In addition, color-coding surface-level errors can assist students in indirectly internalizing what type of error they made and how to correct it without having the need to read the explanation.

Grammarly is an excellent option for automated feedback that is more straightforward. Feedback from Grammarly is a core component for Day 4 of the demonstration plan in this paper. Students are tasked with completing various steps in the writing process; as one of the final steps, students are required to compare peer feedback to AI feedback. First, the students are required to run the paper through Grammarly. Once the paper has been run through the program, the students then copy and paste the feedback they received from Grammarly onto a worksheet (Appendix G). Students then find a partner to peer edit their papers with and attach their partners' comments onto that same worksheet (Appendix G). Finally, the students compare and contrast the feedback they received from both their peers and AI. During this process, students will be able to identify that AI is effective with surface-level error correction. However, humans are typically more adept at providing assistance with organization, cohesion, and cohesiveness.

### 4.3 Genei & SemanticScholar

Olivas and Li (2006) conducted a study about ELLs' ability to fully comprehend academic texts and found that many ELLs struggle mightily with this task. ELLs are often expected to digest academic texts when writing; however, they have a more difficult time comprehending these texts compared to their native-speaking peers. Not only does this academic language gap impact their performance, but it also could be seen as inequitable and stress-inducing (Chen, 1999). If an ELL continually struggles academically compared to their native-speaking peers, they will be more likely to withdraw from conversations with native speakers (Olivas & Li, 2006). Personally, I have seen various newcomer students come to the United States and be embarrassed by their language gap, leading to a prolonged silent period. An AI program called Genei has the potential to address this challenge by supporting student comprehension of texts. This program allows students to input scholarly sources, after which it generates concise summaries of each source's content. This process empowers ELL students because it makes scholarly articles more accessible. In turn, making scholarly articles more accessible will facilitate their comprehension of complex material necessary for writing research papers. By breaking down difficult texts into more manageable sections, Genei allows ELLs to break down and comprehend difficult scholarly research needed for academic writing. This tool represents a fantastic use case for AI and is an indispensable resource for teaching academic writing, particularly to those who aspire to pursue higher education after high school. Along with summarizing academic texts, Genei will also provide visuals and graphics to help visualize articles. According to Genei's own data, it can reduce reading time by 70% (*Genei for Academic Writing*, n.d.).

This efficiency not only saves time but also allows students to digest complex academic content more effectively, which facilitates academic growth.

In connection, SemanticScholar is an AI aggregator that collects sources based on user input (Semantic Scholar, n.d.). This AI tool is accessible, free, and easy to use. Users simply need to type what type of literature they need, and the program will compile a list of scholarly sources within seconds. Not only does it compile a list of sources, but it provides citations, authors, and links to the direct source. Most importantly, it provides a TLDR (SemanticScholar's form of a summary) for each article (Semantic Scholar, n.d.). These TLDRs are no more than 2-3 sentences and provide a basic summary to ensure that the article is relevant to the research the user is looking for. SemanticScholar is a powerful time-saving tool for students and instructors alike, especially when used with Genei.

In order for ELLs to effectively use Genei and SemanticScholar, an instructor needs to show them how to use it. For example, on Day 2 of the demonstration lesson students are assigned scholarly articles to read and summarize as part of the writing process for their research papers. However, these students often struggled to produce wholly comprehensive summaries because they only understood fragments of the scholarly articles. Due to the language needs in a scholarly article, the students often miss key information from the research. To address this challenge, Genei is introduced to the students. In the lesson, students will learn how to incorporate SemanticSeminar into their academic writing process to find scholarly sources. Next, students can enter scholarly articles into Genei to access a summarized and broken-down version of the article. They will also write their own summaries of the scholarly article and compare

them to Genei's. This process demonstrates to the students that although Genei will provide the essential information needed to comprehend the article, they may miss minor details. So, it is good practice to review these AI summaries with the original article to ensure the key details are present. Due to the removal of this text comprehension barrier, ELLs can overcome the language demands of comprehending upper-level vocabulary.

#### **4.4 Magic School AI**

Magic School AI is self-described as an AI tool that is currently being used by over 1 million educators. Its main purpose is to save instructors significant time and effort by streamlining content creation (MagicSchool.Ai - AI for Teachers, n.d.). There is a free version of the program available, but a more advanced version with additional features is offered for a fee. Although Magic School AI can be used by both instructors and students, this program is primarily used by instructors because of its time-saving functionalities, including unit plans, email responses, letter of recommendation templates, video summarizers, and numerous other tools. This section will focus on how instructors can use it to lessen the burden of lesson planning.

First, Magic School AI has the ability to act as a content creation tool. As previously mentioned, Appendix A (rubric for writing) & C (worksheet to collect scholarly sources) were both created with Magic School AI's material creation tool. The user can input prompts as specific or broad as they desire, and the AI will create a worksheet for them. The AI will then provide the user with a worksheet and ask, "Are you okay with this worksheet?" If the worksheet is not correct, the user can input additional information to edit the end creation. Along with creating worksheets, Magic School AI can create

unique reading passages and questions based on students' lexile scores. An instructor can also enter an existing reading passage and enter multiple students' lexile scores. The AI will then generate multiple passages, keeping the content and meaning of the article, but changing the vocabulary to differentiate for each lexile score.

For additional time-saving, Magic School AI can create standards-based lesson plans. It can take any standard and core idea and create an entire lesson plan. As an example, I typed in "10th grade, complex sentences, WIDA standards" into the Magic School AI lesson planning section and received the following:

### **Understanding Complex Sentences**

**Objective: Students will be able to identify, analyze, and construct complex sentences with subordinating conjunctions.**

**Assessment: Students will complete a worksheet where they will identify the independent and dependent clauses in complex sentences and write their own using subordinating conjunctions.**

**Key Points:**

- Recognizing independent and dependent clauses in a complex sentence



- Understanding the role of subordinating conjunctions in connecting clauses
- Building complex sentences using subordinating conjunctions

**Opening:** To start the lesson, I will present students with a sentence puzzle activity where they will need to piece together clauses to form complex sentences. This hands-on activity will engage students and pique their curiosity about complex sentences.

**Introduction to New Material:** I will introduce the concept of complex sentences by showing examples on the board and breaking down the structure of independent and dependent clauses. One common misconception to anticipate is mistakenly identifying a fragment as a clause within a complex sentence.

**Guided Practice:** During guided practice, students will work in pairs to analyze provided complex sentences, identifying the independent and dependent clauses. I will scaffold questioning from simple identification to explaining the function of each clause. I will circulate the room to monitor student understanding and provide assistance as needed.

**Independent Practice:** For independent practice, students will be given a worksheet with a variety of complex sentences. They will need to label the

independent and dependent clauses in each sentence and then create their own complex sentences using subordinating conjunctions.

**Closing:** To close the lesson, students will participate in a "One-Minute Paper" activity where they will write down one thing they learned about complex sentences and one question they still have. This will help summarize the key concepts and address any remaining doubts.

**Extension Activity:** For early finishers, they can create a short story or paragraph using at least five complex sentences. This will challenge them to apply their understanding in a more creative context.

**Homework:** As homework, students will be tasked with finding examples of complex sentences in their reading materials or writing their own sentences at home. They will need to identify the clauses and subordinating conjunctions used.

**Standards Addressed:**

- WIDA Standard 1: English Language Proficiency
- WIDA Standard 3: Language for Learning Mathematics and Science

As shown in the example above, Magic School AI can create standards based lesson plans to help instructors come up with new ideas. The lesson plan generator provides a solid framework that instructors can change based on the needs and preferences of their students. Obviously, the example provided here was very broad, but a user can enter in as specific instructions as they would like. Either way, Magic School AI can generate an endless amount of materials and exercises. By taking advantage of the Magic School AI's tools, instructors can enhance the feedback process and streamline their instructional workload. Overall, Magic School AI provides a unique combination of flexibility, customization, and time-saving features that make it an invaluable resource for educators.

## **5. Issues with AI**

Currently, students are receiving little support on how to best utilize AI like ChatGPT. Students have been confronted with anti-cheating software since they were in elementary school. Now, with AI writing tools, all students have access to a free text generator that is nearly undetectable from anti-cheating programs. These students feel empowered by having technological advancements that directly benefit them (Oravec, 2023). The academic rules on what is an acceptable use of AI and what is not an acceptable use has created a blurred line in academia. At the extreme end, some universities have banned all use of AI, which is essentially a useless endeavor due to new text generators emerging at a rapid pace. (Oravec, 2023). Therefore, it is necessary to educate both students and instructors on the pitfalls of AI use in education.

## 5.1 Negative Student Use of AI

Some students are exploiting the current confusion about AI and using it in an inappropriate manner. These students are entering phrases, for instance, “Write a paragraph on how climate change has affected the midwest region.” ChatGPT will then output an entire paragraph based on the input: this use of AI is a clear example of what many would consider inappropriate. Students would be using the work of somebody else for their own academic benefit, which is considered academic dishonesty and unethical (Khalil & Er, 2023). Not only would they be plagiarizing, but they would also never learn the writing process. By solely using AI work, they are not actively engaging with the writing process.

On the other hand, an example of what appropriate AI use would look like is the following: a student could enter a phrase to ChatGPT they typed out with errors, “Weather changing a lot in the midwest, has shown that there might be something at changing weather patterns.” ChatGPT provided the following revision based on the prior input, “The frequent changes in weather patterns in the Midwest suggest that something significant may be occurring.” After typing, “Explain the grammatical changes”, ChatGPT explains the comma was unnecessary and that the ‘at’ should be omitted. By entering this sentence into ChatGPT, a student would have also learned that ‘frequently’ is a synonym for ‘a lot’. Because the student is entering phrases that are their own, they are appropriately using AI as a learning tool and engaging with the writing process.

An example of appropriate AI use is shown on Day 1 of the demonstration lesson plan. Students are tasked with finding scholarly articles for a persuasive essay. The

instructor teaches the students how they can use SemanticScholar and ChatGPT to aggregate scholarly sources. Further, on Day 3 of the demonstration plan, the instructor teaches the students how to use ChatGPT to generate ideas. For example, how to use ChatGPT to find sentence starters and transitional words. The students are not using AI to write for them, conversely, they are using AI to enhance their writing abilities. They are learning new writing methods and actively engaged with the writing process.

## **5.2 AI Providing Misinformation & Hallucinations**

Sam Altman, CEO of OpenAI, once said the following about using AI, “I verify what it says ... On this trip, I have trusted it for translation and it has been amazing ... but I wouldn’t use it in my normal working life without verifying. This is a generative technology, it is a creative helper, so please don’t rely on it for factual accuracy. This is a message that has mostly got through” (Smith, 1, 2023). This statement emphasizes an important aspect of AI technologies: the need for verification. Altman's caution highlights the fact that AI, including ChatGPT, is not faultless and can produce inaccuracies or misinformation. This perspective serves as a reminder that AI should not be relied upon as a sole source of factual information. Instead, users should approach AI-generated content with the mindset that the given information could be incorrect and verify its accuracy through additional sources or methods. Ensuring AI is not providing false information is crucial in educational settings, where promoting critical thinking and literacy skills is essential. While AI technologies, like ChatGPT, excel in certain areas, such as editing and providing feedback, they are not yet capable of providing content with 100% factual accuracy. Therefore, it is essential to teach students that AI should not be used to generate content without verification. Encouraging students to critically

evaluate AI-generated content helps cultivate a healthy skepticism and promotes responsible use of technology in educational contexts.

For instance, AI has shown that if it does not know the answer to a question, it will lie, not unlike some humans (Deepack, 2023). Deepack (2023) tried typing in meaningless statements that had no answers like, “Truman’s theory plant respiration” and ChatGPT attempted to answer the question with a made-up definition of this supposed theory. Other examples of AI providing falsehoods have been when Ray (2023), a researcher, tried asking ChatGPT questions about depression, and the AI generated fake statistics and facts about depression. The examples provided by Deepack and Ray show a significant concern regarding AI technologies like ChatGPT: their likelihood to generate misinformation when they lack sufficient knowledge or context. Deepack’s (2023) experiment revealed that when presented with nonsense, ChatGPT attempted to fabricate answers, showcasing a tendency to provide inaccurate information rather than admitting its lack of knowledge. Similarly, Ray's (2023) exploration found instances where ChatGPT generated false statistics and facts about depression. There are numerous examples of ChatGPT making up information and lying; the falsehoods are particularly concerning because around 50% of businesses use ChatGPT right now (Bilan, 2023).

Ultimately, these generative inaccuracies lead to AI hallucinations. An AI hallucination is defined as when AI perceives a nonexistent pattern from user input and comes up with an output that either does not make sense or is inaccurate (IBM, n.d.). When AI has incorrectly trained on data input or is lacking necessary information, it will provide a ‘hallucination’. Generally, when a user inputs a question to AI, the user will

receive a logical answer; however, if AI does not comprehend the question, it will provide a falsehood. The AI will create a nonsensical pattern and continue to provide this falsehood to other users as well (IBM, n.d.). An example of this is Google Bard falsely declaring that the James Webb Space Telescope had taken the first picture of a planet outside the solar system (Metz, 2023). The previous example exemplifies the need to teach students that generative AI is in its infancy and it requires constant fact-checking.

### **5.3 Replacing Learning Versus Facilitating Learning**

Chichekian and Benteux's (2022) research highlights a crucial point: AI should not serve as a complete substitute for instruction from qualified instructors. Relying solely on AI for corrective feedback can be counterproductive for students' learning outcomes. Instead, effective integration of AI into the classroom occurs when instructors collaborate with AI tools, taking advantage of their capabilities while maintaining their role as educators (Chichekian & Benteux, 2022). Throughout this paper, it's evident that students benefit most from corrective feedback when instructors work in tandem with AI rather than relying on AI exclusively. In connection, research by D. Ng, Leung, Su, Ross R. Ng, and Chu (2023) suggests that the successful integration of AI in the classroom hinges on the instructor's level of technological proficiency. Instructors who neglect to utilize AI may miss out on the benefits of instant feedback, while those who overly rely on AI risk encouraging students to depend too heavily on technology. Over-reliance on AI could potentially lead students to seek content solely from AI sources without critically evaluating its validity. Moreover, if instructors solely use AI for corrective writing feedback, students may miss out on deeper and more meaningful feedback that only

human instructors can provide (Davy Ng et al., 2023). Therefore, the most efficient approach involves instructors using AI as a tool to enhance their teaching practices while maintaining a balance that ensures students receive comprehensive and meaningful feedback from both AI and human instructors.

#### **5.4 Copyright Infringement & Privacy Concerns**

Since generative AI is a recent development, there are not many legal safeguards against it. For instance, an item created with AI assistance may not be eligible for copyright protection. Currently, in the United States, something needs to be human-made to receive a copyright (Zirpoli, 2023). Congress is undecided at this moment whether AI-assisted items are considered to be human-made or not (Zirpoli, 2023). Moreover, if Congress decides to allow the ability to copyright AI-generated items, the question of ownership will be brought up. At the moment, it is not clear whether the creator of the AI device would receive copyright ownership or the individual who used AI to generate the content (Zirpoli, 2023). An additional question that needs an answer is: Is AI committing copyright infringement? Machine learning, which AI programs utilize, means gathering information and learning from input the AI program has access to. Currently, AI is harvesting information from anything that has ever been posted online. Therefore, AI only knows how to write, make pictures, edit, etc, by training on peoples' works (Zirpoli, 2023). Creators of AI programs argue that all humans train and are inspired by others, so the machine learning utilized by AI should fall under fair use and is not copyright infringement (Zirpoli, 2023). Federally, the United States is still sorting out these legal conundrums.



Similar to copyright concerns, there are limited legal protections for user privacy with AI. In the United States, AI programs can use your online information for various uses. For example, IBM recently trained their AI devices how to recognize faces by using millions of photographs posted online (Sullivan, 2023). One of the major concerns in regard to privacy is AI using data indirectly to infer sensitive information about an individual (Sullivan, 2023). Through machine learning, AI can take seemingly unrelated data from users and infer sexual preferences, health status, political ideology, and more (Sullivan, 2023). Various AI programs use this information to profile and target advertisements towards users (Sullivan, 2023). There are ways that AI can responsibly train on user content without storing information, but without legal protections, there are no guarantees that companies are being sensitive with personal data (Sullivan, 2023). With these legal concerns in mind, it is important to take note of future legislation in the United States regarding generative AI.

## **6. Unit Plan: Teaching students to use AI within Writing Instruction**

To illustrate the uses of AI described above, this section presents a demonstration unit plan that teaches students how to use AI to help them during the writing process. The students will be completing an outline for a persuasive essay. The task involves choosing a region in the United States and researching how climate change has negatively impacted that region. The students will not only be improving their academic writing abilities, but also learning how to use AI responsibly to facilitate their writing proficiency. Throughout the entire writing process students will be tasked with incorporating AI. The goal is for these students to connect with AI in some form during the lesson and responsibly use it in their future writing endeavors.

### *Lesson Unit Learning Goals*

1. Students will be able to utilize AI to find sources for an essay.
2. Students will be able to utilize AI for writing feedback.
3. Students will be able to use AI to summarize and break down scholarly research articles.
4. Students will be able to combine user input, peer feedback, and AI assistance to create an outline for a persuasive essay.
5. Students will be able to use AI to increase sentence complexity, cohesiveness, and to encounter unfamiliar vocabulary.
6. Students will be able to identify hallucinations and false information provided by AI.

### *Class Description:*

**Grade Level:** 10th grade pull-out in a Wisconsin Public School

**Student Language and Cultural Background:** 4 Hmong-speaking students (A-D), 2 Vietnamese-speaking students (E & F), and 2 Spanish-speaking students (G & H)

**Past Educational Experience:** Students A-D have been enrolled at our school district since 6th grade. Student E and F both enrolled this year, but had an extensive education in Vietnam. Students G and H have been in the school system for one year, but both have been attending different school districts throughout the United States since elementary school.

**Class Size:** 8 Students

### Student WIDA Levels:

The students all have similar writing levels. The students all scored between a 3.0-4.0 on their ACCESS writing test. This would put them all in the level 3 (*developing*) category. Their composite scores do range quite a bit. The lowest student is at a 2.8 (*emerging*), while the highest student is a 3.8 (*developing*). This discrepancy is due to their differences in their listening and speaking scores. All of these students have a goal of reaching a 4.0 (*expanding*) on their writing by the end of the year. More detailed scores are presented in the table below.

Student	Writing Score	Composite Score
A	3.2	3.8
B	3.5	3.4
C	3.8	3.7
D	3.0	3.2
E	3.1	2.8
F	3.3	3.0
G	3.4	3.2
H	3.5	3.5

*Table 1.* Student Proficiency Scores

### Standards

#### Standard 1 - Language for Language Arts

English learners communicate information, ideas and concepts necessary for academic success in the content area of language arts. (WIDA, 2020).

#### Standard 1 - Language for Science

English learners communicate information, ideas and concepts necessary for academic success in the content area of science (WIDA, 2020).

*Prior Work*

The students have written two persuasive papers before this assignment. Therefore, they are familiar with the writing process. Throughout the lesson the instructor will still give them reminders on what a persuasive essay is supposed to entail; however, the students should not need extensive explanation in this regard. AI usage has been taught in the classroom before as well, but the students are being introduced to new ways that can utilize AI in this lesson.

## **Day 1: Introduction to Scholarly Research and Resources**

### **Objectives:**

- Students will be able to use AI to find scholarly sources.
- Students will be able to use AI to cite and keep a list of scholarly sources.

### **Materials:**

- A computer or device with an internet connection and a keyboard
- A BenQ board or something that can be projected to students
- Appendix A: Rubric for Persuasive Essay
- Appendix B: Scholarly Sources for Students
- Appendix C: Scholarly Sources Graphic Organizer

### **Introduction to Persuasive Writing Project (0:00-5:00):**

- Explain to the students that we will begin a persuasive writing assignment on the effects of climate change.
- They will be able to choose between the following regions in the United States: Midwest, West, East, and the South.

### **Assignment Overview (5:00-10:00):**

- Explain to the students that the assignment will be 1-page. They will need to use scholarly sources to back up their claims. **(Refer to rubric Appendix A)**
- Explain to the students that they will be integrating AI into their writing process to write this paper and that you will explain how they will use AI each step of the way.

**Introduction to Scholarly Sources (10:00-20:00):**

- Explain to the students that scholarly sources are reliable forms of research conducted by somebody who is considered knowledgeable and has expertise in a particular field.
- Provide them examples of multiple scholarly articles about climate change in the United States (**Appendix B**).
- Ask the students questions like, “What makes these articles scholarly?” or “Do these articles look different from typical websites you visit?”
- These discussions should center around the organization of the articles and the sourcing in the article.

**Scholarly Sources Sheet Introduction (20:00-25:00):**

- Provide the students with a scholarly sources worksheet (**Appendix C**).
- Students will need to find 3 scholarly sources about how climate change is affecting the following regions: Midwest, West, East, and the South.

**Using ChatGPT for Research (25:00-35:00):**

- Demonstrate to the students how ChatGPT can be used for research by opening up ChatGPT and searching for phrases like, “How has climate change negatively impacted the midwest region of the United States?”
- Once you have entered these key phrases, follow the sources that ChatGPT provides. Briefly read over these sources with the class and ask if they find them to be helpful.

- Have the students spend 2-3 minutes using ChatGPT to find sources for their assignment.

### **Introduction to SemanticScholar (35:00-45:00):**

- Introduce students to SemanticScholar. Explain to the students that SemanticScholar is another tool that searches scholarly databases to find research articles based on user input.
- Show the students how they can use filters and keywords to find scholarly articles that are relevant to topics that they are researching.
- Have the students spend 5 minutes using Semantic Scholar to find scholarly sources for their worksheets.

### **Using Citation Tools (45:00-55:00):**

- Emphasize the importance of giving credit to sources they use in a paper. Tell the students that if they do not provide credit, it is considered plagiarism.
- Introduce the students to the site Bibcitation. This site will automatically provide a citation in any form for students if they input the scholarly article's DOI number. It will keep a list of the citations and put them in alphabetical order for the students as well.
- Tell the students that they will be expected to cite their sources for this persuasive essay, so it would behoove them to use Bibcitation to keep track of their sources.



**Assessment (55:00-60:00):**

- Collect the scholarly worksheet assignment handed out at the start of class.
- Tell the students this sheet will be returned to them tomorrow so they can continue using it for their papers.
- Check the paper and see if the students were able to find scholarly sources using ChatGPT and SemanticScholar.

**Day 2: Making a Claim and Evaluating Sources with AI****Objectives:**

- Students will be able to use AI to summarize scholarly articles.
- Students will be able to compare and contrast the differences and similarities of AI vs. Human summaries of scholarly articles.

**Materials:**

- A computer or device with an internet connection and a keyboard
- A BenQ board or something that can be projected to students
- Appendix D: Claim Organizer

**Introduction (0:00-5:00):**

- Explain to students that evaluating their scholarly sources is an important aspect of research.
- Explain that students will need to be able to read research studies and summarize their findings for academic papers.

- Inform the students that AI can be used to summarize findings of scholarly articles for them and that we will be delving into that aspect today.
- Tell students that they will need to create a claim today in order to narrow down their research.

### **Selecting a Claim (5:00-10:00):**

- Hand the students back their scholarly sources assignment from yesterday.
- Tell the students they need to specify a region in the United States today for their persuasive essay.
- Hand them the writing a claim worksheet (**Appendix D**).
- Inform the students that they need to make a statement with their claim and take a side of an argument, for example, “Climate change has a negative impact on the midwest region because it causes shortened farming seasons, reduced air quality, and dryer summer seasons.”

### **Demonstrate AI Summarization (10:00-25:00):**

- Demonstrate AI summarization by taking two sources about the negative impact of climate change in a certain region of the United States and entering them into Genei. Show the students how Genei summarizes the article for them and can show them where to find critical information within the scholarly article.
- Continue to demonstrate by taking two additional sources about the negative impact of climate change in the United States and have SemanticScholar summarize the article.

- Lead a discussion with students about which tool they find more user-friendly. Tell them that either tool is effective and it is up to them which they prefer to use.
- Lead an additional discussion with students about how these summaries should be used to help them understand a dense article. These summaries can help guide them where to find relevant information for their research.
- Read one of the articles together as a class and then evaluate the effectiveness of the Genei summary together.

### **Choose and Summarize Scholarly Articles (25:00-40:00):**

- Hand the students a worksheet that has the students summarizing one of their chosen scholarly articles. The student should choose a scholarly article that aligns with the region they want to write about.
- Have the students read the article that they chose.
- After reading the article, have the students write down a summary of it.
- They will then copy and paste an AI summary of the same article. The students will be pasting the summaries from SemanticScholar and Genei.
- Finally, they will compare and contrast their summary compared to the two AI summaries (**Appendix E**).
- Give students time to complete part of this assignment in class.

### **Share and Compare Discussion (40:00-55:00):**

- Have students share their experiences and compare their summaries with the AI-generated ones with a partner.

- Discuss any differences or similarities and the effectiveness of AI tools in summarizing scholarly articles.
- After 10 minutes have a discussion with the entire class.
- Informally assess if students were able to secure proper AI summarizations.
- Ask questions like, “Were the summaries effective?”, “Did the AI help you find key information within the articles?”, “Were there differences between your summary and the AI summary?”

**Assignment (55:00-00:00):**

- The students will be tasked with finishing the assignment handed to them earlier today (**Appendix E**).
- They should be about halfway done at this point.
- They will be showing their finished work to the instructor the next day.

**Day 3: Using ChatGPT for Creating Persuasive Paper Outlines**

**Objectives:**

- Students will be able to use generative AI (ChatGPT) to create ideas when there is a language barrier or if they are stuck.
- Students will be able to use generative AI (ChatGPT) to encounter and use new vocabulary terms, sentence structures, and transitional words.

**Materials:**

- A computer or device with internet connection and a keyboard
- A BenQ board or something that can project to students

- Appendix E: AI versus Human Summaries
- Appendix F: Persuasive Essay Outline

### **Introduction (0:00-5:00):**

- Informally lead a discussion about **Appendix E** to ensure each student finished this assignment the night before.
- Ask questions such as, “How did your summary differ from the AI’s?” “Did you learn any new phrases/vocabulary words by analyzing the AI summary?”
- Hand out the outline worksheet for the students’ persuasive papers. Explain that the students will be working on this sheet today (introduction, main arguments, rebuttal, and conclusion - **Appendix F**).

### **Work on the Introduction section of the Outline (5:00-15:00):**

- Inform the students that the introduction in the outline requires students to provide a hook, background information, and a claim (this is not their first persuasive essay, so they know these terms).
- Remind them that they already finished their claim, so they can copy and paste it into the document.
- Demonstrate ways students can use ChatGPT to assist them with writing their introduction by entering the following phrases:
  - “Sentence starters for a hook about climate change in the USA for a persuasive essay.”
  - “What background information is necessary for writing a persuasive essay about climate change in the USA?”

- “What information should I include in an introduction for a persuasive essay about climate change in the USA?”
- Explain to students that ChatGPT is great for generating ideas when they are having a difficult time coming up with the language they need for writing.

### **Work on the Argument Section (2 paragraphs) of the Persuasive Essay**

**(15:00-35:00):**

- Explain to students that this section is 2 paragraphs, both needing a topic sentence.
- The students will also need to provide 3 pieces of supporting evidence. This may include examples, anecdotes, or facts discovered from their scholarly article research.
- The students will also need a concluding/wrap-up sentence for each paragraph.
- Demonstrate to the students ways to utilize AI when working on their argument section.
- For example, entering the following phrases into ChatGPT:
  - “Information necessary to include for climate change in a specified region”
  - “How to increase coherence within my argument section of a persuasive essay (copy and paste their rough draft into ChatGPT)”
  - Asking ChatGPT for synonyms of commonly used words
  - Asking ChatGPT how to increase sentence variety

### **Work on the Rebuttal Section (1 paragraph) of the Persuasive Essay**

**(35:00-45:00):**

- Remind students that the rebuttal/counterargument section is where they will need to address why somebody may disagree with the assertions they made in their persuasive essay.
- Show the students that ChatGPT can be used if they have a difficult time coming up with the language/ideas for counterarguments by entering the phrase, “Counterarguments for the following statements: *Copy and Paste arguments made.*”
- Remind them to check the “**How I can use AI to assist me**” section on their outlines.

### **Conclusion (1 paragraph) of the Persuasive Essay (45:00-55:00)**

- Students will now finish the conclusion part of their outline.
- They will be tasked with restating their claim and finishing with concluding thoughts.
- Show students examples of how to use generative AI by entering the following prompts into ChatGPT:
  - “How to start a concluding paragraph for a persuasive essay?”
  - “Transitional words within a concluding paragraph”

- “Information I should include in my concluding paragraph for a persuasive essay.”
- Have students refer to their “How can I use generative AI if I am stuck” section of Appendix F for additional ideas.

**Wrap-up (55:00-0:00):**

- Students will turn in their outline assignment.
- These will be handed back to students tomorrow.
- The instructor will check over their outlines and give feedback.
- Students will be told that they will be editing their outlines tomorrow.
- Recap how they integrated AI into their writing by helping them come up with ideas, vocabulary, transitional words, sentence stems, etc.

**Day 4: Using Grammarly and Peer feedback in Writing Instruction****Objectives:**

- Students will be able to apply AI feedback from Grammarly in their writing.
- Students will be able to identify and incorporate feedback from peers and AI.

**Materials:**

- A computer or device with an internet connection and a keyboard
- A BenQ board or something that can be projected to students
- Appendix G: Grammarly AI versus Peer Editor Feedback
- Appendix F: Persuasive Essay Outline



**Launch (0:00-10:00):**

- Hand back students' outlines and have them read the feedback they received.
- Allow students to make any necessary revisions based on instructor feedback.
- Explain to the students that today, we will be focusing on using AI to help edit their writing.

**Using Grammarly AI Assistance for Editing (10:00-25:00):**

- Show students how to use their student Gmail account to log into Grammarly.
- Demonstrate to students how to upload their outline to Grammarly.
- Guide students through the process of using Grammarly's AI assistance to check for grammar, spelling, punctuation, and style errors.
- Ensure that students are paying attention to Grammarly's suggestions for improving clarity, coherence, and overall writing quality.
- Hand students **Appendix G**, a worksheet where they will keep their peer feedback and Grammarly's AI feedback.
- Have the students copy and paste the feedback received from Grammarly on **Appendix G**.

**Peer Editing (25:00-45:00 minutes):**

- Pair students up with a partner to peer edit their papers with. They will be trading their peer editing sheets with their partners (**Appendix G**).
- Go over the peer editing sheet to ensure the students understand the feedback they are supposed to provide.

- The students will trade outlines and then start peer editing. They will not be using any AI assistance for this part.
- Ensure the students take their time and are leaving comments/feedback on the peer editing checklist.

### **Comparing Feedback (45:00-55:00 minutes):**

- After completing the peer editing process, have students compare the feedback they received from Grammarly with the feedback provided by their peers.
- Facilitate a discussion with the class comparing the feedback from their peers to the Grammarly feedback.
- Ask questions such as the following:
  - “Was the feedback similar?”
  - “Do you prefer one over the other?”
  - “Do you feel like receiving both types of feedback is beneficial?”
- Students will then need to complete the last section of **Appendix G**. This section has them comparing and contrasting the feedback they received from Grammarly versus their peers.

### **Assignment and Reflection (55:00-00:00):**

- Remind students how they can use AI for feedback when writing rough drafts.
- Have the students turn in a copy of **Appendix G**.
- The homework for the students will be to incorporate the AI and the peer editor feedback into their outline for the next week of class.

## 7. Conclusion

In conclusion, while AI technology in education is still in its infancy, even lacking a universally agreed-upon definition, it holds incredible potential, particularly for writing instruction for ELLs. The objectives of this paper were to (a) inform instructors how they can utilize AI to improve their ELL students' writing and (b) support instructors by decreasing burnout in the profession with time-saving measures from AI programs. The literature review conducted in this paper provided evidence that ELLs benefit from AI's ability to tailor feedback to different learning styles and dispense instant feedback for surface-level error correction. Moreover, Instructors are contemplating leaving the profession at an unprecedented rate due to the demanding nature of it, however, AI's generative mechanisms can lessen demands on instructors and help keep quality educators in the profession.

The research suggests It is beneficial for instructors to embrace this technology and integrate it into their classrooms to ensure that students learn how to use it responsibly. Failure to do so may result in students not only having an overreliance on AI but also using it in improper ways without understanding its limitations, leading to misinformation and a decline in critical thinking skills. To demonstrate appropriate use, Instructors must conduct research to understand how to effectively incorporate AI into their teaching practices. By neglecting to explore proper AI usage, instructors risk blocking their students from valuable learning opportunities and hindering their ability to use AI appropriately. Studies have offered promising findings about the potential effectiveness of AI in enhancing learning outcomes, and investment in AI continues to grow. Furthermore, students are increasingly interested in using AI technologies. Due to

these aforementioned factors, it is an instructor's responsibility to adapt to modern learning conventions and use AI to facilitate writing growth in their students. By using AI technology responsibly, instructors can encourage students to thrive in an increasingly digital and technologically advanced world.

Furthermore, the use of AI continues to expand at a near-infinite rate. Staying informed about academic and technological trends, including advancements in AI, is important for educators and learners alike. While this paper has explored some of the ways AI can benefit ELLs by enhancing their vocabularies, improving their writing skills, and facilitating peer editing, it's important to recognize that the potential applications of AI in education are nearly limitless. We are only beginning to scratch the surface of what AI can accomplish in the educational field. As the use of AI becomes more prevalent, it's critical for instructors to teach the new generation how to use AI effectively. At this current tipping point, where AI could be seen as a deterrent to learning for some, it's up to educators to shape the narrative and demonstrate how AI can be a valuable asset for education. By fostering a culture of innovation, curiosity, and responsible use of technology, instructors can prepare students to thrive in an increasingly digital and AI-driven world.

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### Appendix A: Rubric for Persuasive Essay

Criteria	5 - Excellent	4 - Proficient	3 - Basic	2 - Below Basic	1 - Incomplete
Claim	Clear, concise, and strongly presents the main argument	States the main argument effectively	Partially states the main argument	Unclear or missing main argument	Claim statement is absent
Evidence & Examples	Provides well-developed examples and evidence to support the argument	Includes relevant examples and evidence	Examples and evidence are somewhat unclear or not detailed	Lacks appropriate examples or evidence	Very minimal or no examples/evidence provided
Organization	Logical progression of ideas with clear transitions	Organized with some logical progression	Organization is somewhat confusing	Disorganized and lacks clear structure	Very little or no organization present
Persuasive Techniques	Effectively uses a variety of persuasive techniques to convince the audience	Uses some persuasive techniques	Attempts to use persuasive techniques but not consistently	Uses very few persuasive techniques	Does not use persuasive techniques
Grammar & Spelling	Almost no errors in grammar or spelling	Few errors that do not detract from understanding	Several errors that may detract from understanding	Many errors that detract from understanding	Significant errors throughout
Rebuttal	Effectively rebuts any counter arguments with cited sources	rebutts some counter arguments with sources	rebutts a few counter arguments with a source	rebutts 1 counter argument	Does not rebut any counter arguments

(MagicSchool.AI - AI for Teachers, n.d.)

**Appendix B: Scholarly Sources for Students****Midwest:**

1. Title: "Climate Change in the Midwest: A Synthesis Report for the National Climate Assessment"

- Authors: Hatfield, J. L., Takle, E. S., Grotjahn, R., Holden, P. W., Izaurralde, R. C., Mader, T. L., Marshall, E. P., Liverman, D. M., Adams, P. J., Barney, G. O., Degaetano, A. T., Gaitán, C. F., Leung, L. R., Ma, L., Stewart, R. E., & Takle, G. S.

- Journal: Technical Report to the National Climate Assessment

- Year: 2014

- DOI (<https://doi.org/10.7930/J0G15XS3>)

2. Title: "The Impacts of Climate Change on Agriculture and Rural Communities in the Midwest"

- Authors: Walsh, K. M., Wuebbles, D. J., & Hayhoe, K.

- Journal: Climate Change in the Midwest

- Year: 2013

- DOI (<https://journals.sagepub.com/doi/full/10.1177/1075547017728678>)

**West:**

1. Title: "Climate Change in the Western United States"

- Authors: Mote, P., Salathé Jr, E., & Lee, S. Y.

- Journal: Climatic Change

- Year: 2010

- DOI (<https://doi.org/10.1007/s10584-009-9389-6>)



2. Title: "Projected Climate Change Impacts on Skiing and Snowmobiling: A Case Study of the United States"

- Authors: Steiger, R., Abatzoglou, J. T., & Hegewisch, K. C.

- Journal: Tourism Geographies

- Year: 2019

- DOI (<https://doi.org/10.1080/14616688.2019.1642622>)

**East:**

1. Title: "Climate Change and its Impacts on the Eastern United States"

- Authors: Kunkel, K. E., Stevens, L. E., Stevens, S. E., Sun, L., Janssen, E.,

Wuebbles, D., Rennells, J., DeGaetano, A., Dobson, J. G., & Ferland, M. G.

- Journal: Climatic Change

- Year: 2013

- DOI (<https://doi.org/10.1007/s10584-013-0855-4>)

2. Title: "Understanding and Managing Climate Change Impacts in the Eastern United States: Results of the Climate Change Response Framework Project"

- Authors: Janowiak, M. K., D'Amato, A. W., Swanston, C. W., Iverson, L.,

Thompson, F. R., Dijak, W. D., Matthews, S., Peters, M. P., Prasad, A. M., & Fraser, J. S.

- Journal: General Technical Report

- Year: 2017

- DOI (<https://doi.org/10.2737%2FNC-462>)

**South:**

1. Title: "Impacts of Climate Change on Southern United States Agriculture"

- Authors: Hatzopoulos, P. V., Baehr, A., & Johnston, M.
- Journal: The International Journal of Climate Change: Impacts and Responses
- Year: 2019
- DOI (<https://doi.org/10.18848/1835-7156/CGP/v09i03/1-12>)

2. Title: "Understanding Climate Change Vulnerability in the Southern United States"

- Authors: Lackstrom, K., Howard, J. L., Kafalenos, R., Hoogenboom, G., Franzese, P., Kunkel, K. E., & Stevens, L. E.
- Journal: Sustainability
- Year: 2018
- DOI (<https://doi.org/10.3390/su10041350>)

(*Semantic Scholar*, n.d.)

**Appendix C: Scholarly Sources Graphic Organizer**

Source Title	Region	Short Description of Source
1	Midwest	
2	Midwest	
3	Midwest	
4	South	
5	South	
6	South	
7	West	
8	West	
9	West	
10	East	
11	East	

(MagicSchool.AI - AI for Teachers, n.d.)

## Appendix D: Claim Organizer

**Question: How does Climate Change affect a Particular Region in the United States?**

<b>Claim</b>	
Write a statement that answers the question.	
<b>Evidence</b>	
Provide cited academic reasoning to support your claim. Your evidence should be relevant and <i>sufficient</i> (enough to convince someone that your claim is correct). You may use bullet points.	
<b>Reasoning</b>	
Use cited sources and knowledge that you have about <u>why</u> your evidence supports your claim. Explain how your analysis proves your point. Please write in complete sentences here.	

## Appendix E: AI versus Human Summaries

### Scholarly Sources Comparison Form: Student vs. AI Summarization

**Reminder:** A strength means you could easily understand the feedback. A weakness means the feedback was unintelligible.

#### Source Information:

- Title of Source: \_\_\_\_\_
- Authors: \_\_\_\_\_
- Journal/Book Title: \_\_\_\_\_
- Year of Publication: \_\_\_\_\_
- Summary Source: Human / AI

Type of Summarization	Summary
Student	
SemanticScholar	
Genei	

#### 1. Accuracy of Content:

- Human Summary:
  - Strengths:
  - Weaknesses:
- SemanticScholar Summary:
  - Strengths:
  - Weaknesses:
- Genei Summary:
  - Strengths:

- Weaknesses:

## **2. Completeness of Information:**

- Human Summary:
  - Did it cover all essential points?
  - Any important details missed?
- SemanticScholar Summary:
  - Did it cover all essential points?
  - Any important details missed?
- Genei Summary:
  - Did it cover all essential points?
  - Any important details missed?

## **3. Clarity and Coherence:**

- Human Summary:
  - Was the summary easy to understand?
  - Did it flow well from one point to the next?
- SemanticScholar Summary:
  - Was the summary easy to understand?
  - Did it flow well from one point to the next?
- Genei Summary:
  - Was the summary easy to understand?
  - Did it flow well from one point to the next?

**4. Relevance to Topic:**

- Human Summary:
  - Did the summary stay focused on the main topic?
  - Were there any tangents or irrelevant information?
- SemanticScholar Summary:
  - Did the summary stay focused on the main topic?
  - Were there any tangents or irrelevant information?
- Genei Summary:
  - Did the summary stay focused on the main topic?
  - Were there any tangents or irrelevant information?

**5. Language and Style:**

- Human Summary:
  - Quality of writing (grammar, syntax, etc.):
  - Tone and voice:
- SemanticScholar Summary:
  - Quality of writing (grammar, syntax, etc.):
  - Tone and voice:
- Genei Summary:
  - Quality of writing (grammar, syntax, etc.):
  - Tone and voice:

(OpenAI, 2024)

## Appendix F: Persuasive Essay Outline

### PERSUASIVE ESSAY OUTLINE

<u>Introduction Paragraph Outline</u>	
<p><b>Hook</b></p> <p>(Write a few sentences that state what your topic is, as well as why it is important. You could ask a question, tell a story, or highlight the <b>debate</b> between opposing sides about your subject)</p>	
<p><b>Claim</b></p> <p>(Your <b>claim</b> is a sentence or two that indicates your <b>position</b>. It should <b>highlight</b> the main points that you later <b>expand</b> on)</p>	



<b>Paragraph #1 Argument Outline</b>	
<b>Introduction</b> (Provide a sentence that allows the reader to know the topic)	
<b>Argument</b> (Provide a sentence that states your argument along with your reasoning)	
<b>Evidence</b> (Offer <b>logical</b> or <b>reasonable</b> support for your claim, such as <b>facts and opinions from your cited sources</b> )	
<b>Rationale</b> ( <b>Expand</b> on how the provided evidence connects to your claim)	

<b>Paragraph #2 Argument Outline</b>	
<b>Introduction</b> (Provide a sentence that allows the reader to know the topic)	
<b>Argument</b> (Provide a sentence that <b>states</b> your opinion, along with your reasoning)	
<b>Evidence</b> (Offer <b>logical</b> or <b>reasonable</b> support for your claim, such as <b>facts and opinions from your cited sources</b> )	
<b>Rationale</b> ( <b>Expand</b> on how the provided evidence connects to your claim)	

<b>Paragraph #3 Counter Argument Outline</b>	
<p style="text-align: center;"><b>Introduction</b></p> <p>(Provide a sentence that indicates the topic, as well as your opinion)</p>	
<p style="text-align: center;"><b>Counter-Argument</b></p> <p>(Why is your opinion open to debate? Offer a <b>rebuttal</b> to challenge the <b>opposition</b>)</p>	
<p style="text-align: center;"><b>Evidence</b></p> <p>(Offer <b>logical</b> or <b>reasonable</b> support for your claim, such as <b>facts and opinions from your cited sources</b>)</p>	
<p style="text-align: center;"><b>Rationale</b></p> <p>(Expand on how the provided evidence affirms your opinion)</p>	

<b>Conclusion Paragraph Outline</b>	
<b>Claim</b>  ( <b>Restate</b> your claim to <b>summarize</b> your opinion, as well as the arguments you expand on in your essay.)	
<b>Concluding Remark</b>  What questions are still left for further research? What does your audience <b>learn</b> from reading your essay? What <b>steps</b> should be taken now that your topic has been explored? Who can <b>benefit</b> from learning more about your topic? These are all questions that you can answer in order to effectively conclude your essay.)	

---

**Enter in the following phrases to ChatGPT:**

<b>Introduction</b>	<p>“What is a good hook for <i>my topic</i>?”</p> <p>“What is included in a good claim?”</p> <p>“What type of information should I include about <i>my topic</i>?”</p> <p>“What are good sentence starters for an introduction in a persuasive essay?”</p>
<b>Argument Paragraphs</b>	<p>“What are some adverse effects of climate change in <i>my region</i>?”</p> <p>“What are some transitional words I can use in a persuasive essay?”</p> <p>“What are some sentence starters for a persuasive essay?”</p>

	“Does my evidence support my rationale in this paragraph (copy and paste evidence)?”
<b>Counter Argument Paragraph</b>	“What are some transitional words/sentences I can use for my rebuttal in a persuasive essay?” “What are some counter arguments to <i>my claim</i> ?”
<b>Concluding Paragraph</b>	“What are some concluding transitional words/sentences?” “How can I reword my claim for my conclusion?” “What type of information do I need to include in the conclusion of a persuasive essay?” “What is a good way to end a conclusion in a persuasive essay?”

(Mondays Made Easy, n.d.)

## Appendix G: Grammarly AI versus Peer Editor Feedback

**Directions:** Please copy and paste the feedback from Grammarly in the empty summary box below

Type of Feedback	Summary
Grammarly	

**Directions:** Please fill out each box with comments.

What you are looking for	Yes/No & Comments
Did they include an interesting hook to grab the reader's attention?	
Did they provide enough background information to let the reader know what/why this is an issue?	
Did they state a clear claim, that argues only one point (without using "I"), listing the evidence they will talk about?	
Did they use direct quotes from the article to support the claim?	
Did they analyze their evidence by explaining what it means in their own words and explain why it supports their argument	
Did they include a counter argument, with evidence from an opposing view, and then refute it with their evidence-showing why it was stronger?	
Did they use different and appropriate transitional phrases for each piece of evidence, counter argument etc.?	

Did they check for and correct spelling and grammar?	
Did they restate their argument /wrap up their ideas in their conclusion?	

### Compare and Contrast Feedback from AI vs. a Peer

**Directions:** Finish the Venn Diagram below comparing and contrasting the strengths and weaknesses of feedback from AI and your Peer.

