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# Comparing the Effectiveness of Artificial Intelligence (AI) Models, ChatGPT and Meta AI to Detect and Correct Morphosyntactic Errors in BS Accounting Student's Written Text

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## Abstract

*The current study explores the effectiveness of artificial intelligence (AI) models, specifically ChatGPT and Meta AI, in identifying and categorizing morphosyntactic errors in academic texts. Morphosyntactic errors encompass issues in both morphology (word forms) and syntax (sentence structure), areas often challenging for non-native English speakers and students in fields outside of linguistic training, such as accounting. This study compares the error-detection abilities of ChatGPT and Meta AI on a sample text written by a BS accounting student, aiming to determine each model's strengths and limitations in this domain. Using qualitative content analysis, we categorize the types of errors each model identifies and assess the corrective feedback provided. The errors were categorized using the surface technique developed by Dulay et al. (1982) and an adaption of linguistic category developed by Gayo and Widodo (2018). The data collection and analysis were carried out using Keshavarz's (2012) methodology of error analysis. The results reveal that both ChatGPT and Meta AI can effectively detect morphosyntactic errors, Meta AI offers a broader range of corrections that encompass both grammar and style, enhancing readability and contextual clarity. This makes Meta AI a more robust tool for advanced error detection, particularly in academic writing, where both accuracy and stylistic sophistication are crucial. This research aims to provide insights for educators, researchers, and AI developers regarding the application of AI-driven grammar tools in academic writing. Findings contribute to a better understanding of the current capabilities and areas for improvement in AI-based language assistance.*

***Keywords:*** Morphosyntactic errors, Linguistic training, Error detection, Content analysis, Academic writing

## Introduction

Technology is rapidly reshaping the educational landscape (Akram et al., 2021; 2022), offering innovative tools to support language learning and writing skills (Chen & Ramzan, 2024; Ramzan et al., 2023). Among these advancements, Artificial Intelligence (AI) is transforming the landscape of educational and linguistic support (Ma et al., 2024), offering tools for grammar correction (Akram & Abdelrady, 2023) language learning (Abdelrady & Akram, 2022; Ramzan et al., 2023), and general goal-setting assistance (Akram & Sohail, 2024). Among these advancements, ChatGPT and Meta AI have gained significant attention as language models capable of providing detailed language feedback. These tools are increasingly being integrated into academic settings to assist students and educators in enhancing written communication, particularly for those who are non-native English speakers or those studying in fields not traditionally focused on linguistic proficiency.

Morphosyntactic errors, which involve mistakes in both morphology (the structure of words) and syntax (the structure of sentences), are common among students. These errors can stem from various issues, including unfamiliarity with academic English conventions (Ramzan et al., 2023; Ramzan & Alahmadi, 2024) or a lack of formal training in language structures (Li & Akram, 2023, 2024). For students in technical or business disciplines, such as accounting,

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identifying and correcting these errors is particularly crucial, as effective communication is vital for professional success. Historically, these errors have been addressed manually, but with AI technology, automatic and instantaneous error detection is now possible.

The present study seeks to evaluate and compare the capabilities of two leading AI language models—ChatGPT and Meta AI—in identifying morphosyntactic errors in a text sample written by a BS accounting student. By comparing the models' error-detection performance, this research aims to highlight the strengths and limitations of each AI tool in supporting academic writing and to guide future improvements in AI-driven grammar tools.

### 1.1.Problem Statement:

With AI models like ChatGPT and Meta AI now available to assist with writing correction, students have increased access to tools that can help improve the accuracy and professionalism of their written work. However, there is little research comparing the capabilities of different AI models in detecting specific types of linguistic errors, particularly morphosyntactic ones. Given the importance of clear and error-free writing in academia and professional contexts, it is essential to understand the accuracy and limitations of these models.

### 1.2.Significance of the Study:

This research is significant due to the growing reliance on AI tools for language support in educational contexts. AI-driven grammar checkers are increasingly used by students and professionals alike, but little is known about the specific capabilities and limitations of these models in detecting complex morphosyntactic errors. By understanding the error-detection capabilities of ChatGPT and Meta AI, educators and students can make informed decisions on the most effective tools for academic writing. Additionally, insights from this study may inform AI developers about areas where current models could be improved, ensuring that future AI tools better meet the needs of academic and professional users.

### 1.3.Research Question:

This study addresses the question:

To what extent do ChatGPT and Meta AI differ in identifying and classifying morphosyntactic errors in a text written by a BS accounting student?

### 1.4.Aims & Objectives:

The general aim of this study is to assess and compare the error-detection capabilities of ChatGPT and Meta AI in identifying morphosyntactic errors. The specific objectives are:

1. To categorize the types of morphosyntactic errors identified by each AI model.
2. To evaluate the effectiveness of each AI model in providing corrective feedback on these errors.
3. To highlight areas where each model performs well and areas where improvements may be required.

## Literature Review:

English is taught as one of the main subjects throughout different grades in Pakistan (Ramzan et al., 2021). Starting from the elementary level in elementary school or junior high school, all learners are expected to reach a certain competency level during high school years (Akram et al., 2020). By the time the students pass the higher secondary level classes, it is expected that they have an intermediate level of English, meaning that they can produce clear, well-structured, detailed text on complex subjects with making major errors both at word and sentence levels (Ramzan et al., 2023). Keeping this in view, a study by () examines common morphological and syntactical errors in student research articles from the English education department. The study's findings demonstrate that mistakes can be identified at both the morphological and syntactical levels. Inflection, derivation, preposition, article, possessive determiner, quantifier determiner, copula be, and pronoun are all included in the morphological

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level. The passive voice, tense, infinitive, noun phrase, adverbial clause, adjectival clause, auxiliary, and subject-verb agreement are all included in the syntactical level (Amjad et al., 2021). Regarding the origin of errors, both intralingual and interlingual elements are thought to be responsible (Purinanda et al., 2022).

The study conducted by Daquilema (2024) was aimed at finding the most prevalent morphosyntactic errors in EFL students' written work. 36 A1 level EFL students from a public institution in Cotopaxi were selected. The error analysis method was applied in order to identify the errors related to word omission, spellings, articles' usage, double consonants usage, incorrect verb tenses, incorrect word choices, punctuation, prepositions, incorrect word forms, agreement, pronouns, translated words, simple words, lexicon, style, number, and order of adjectives. In the final two weeks of July 2022, two different kinds of written compositions were acquired in order to collect data. The findings revealed that the majority of errors in students' writings were related to punctuation, spelling, capitalization, and sentence structure—all of which fall under the category of mechanical and grammatical errors. The study concluded that pupils find writing in English to be quite difficult since they must constantly interact with the English language. In this way, pupils will communicate more effectively in writing if written errors are fixed early.

Another study by Ulhaq et al. (2022) was carried out with the purpose to determine the morpho-syntactic errors made by university students at Kuningan University's English Department when producing argumentative texts, as well as the challenges that these students encountered. Descriptive qualitative methods were employed through the use of interviews and document analysis tools. Five second-semester English Education Department students served as the research's subjects. The results of the document analysis revealed that the most common errors were in the use of prepositions (6 errors, or 25.24%), verbs group (4 errors, or 16.5%), articles and word order (3 errors, or 12.5%), relative clauses and relative pronouns (3 errors, or 8.3%), tenses and adverbs (2 errors, or 4.16%), and conditional sentences (0 errors). Additionally, according to interviews, students struggle with language features, grammar, vocabulary selection, writing technique, personality background, study background, and the environment, which includes learning resources, when producing argumentative papers. These factors impacted the students' ability in producing argumentative writings, which is why the above-mentioned errors were discovered.

Another study by Mammeri (2015) seeks to examine written compositions of EFL students to explore morphosyntactic errors. The study aimed to discover, classify, and provide a plausible interpretation of the many morphosyntactic errors committed by the learners. Consequently, a corpus of 120 written English pieces was gathered from second-year LMD students in the English department at Bejaia University, Algeria. Upon examining the corpus, the study identified the following morphosyntactic problems at the sentence level: word order, Subject-verb agreement, verb structure, noun/adjective/adverb structure, inclusion of words/morphemes, deletion of words/morphemes, brief forms/abbreviations, and colloquial casual terminology. It concluded with some instructional suggestions to address the previously described issue and for enhanced writing efficacy.

Moreover, a study carried out by Mizumoto et al. (2024) examined the efficacy of ChatGPT as an instrument for assessing linguistic precision in second language (L2) writing, framed within the complexity, accuracy, and fluency (CAF) paradigm. This study utilized the Cambridge Learner Corpus First Certificate in English (CLC FCE) dataset, an error-tagged learner corpus, to compare ChatGPT's performance against human evaluators and Grammarly in evaluating errors and accuracy rates across 232 writing examples. The results revealed a significant correlation between ChatGPT's evaluations and human accuracy scores, illustrating its precision in automated assessments. Compared to Grammarly, ChatGPT demonstrated a

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greater congruence with human evaluations and students' writing assessments. Consequently, ChatGPT may serve as a valuable instrument for improving efficiency in L2 research and L2 writing instruction.

The research conducted by Pfau et al. (2023) constituted a groundbreaking initiative in employing ChatGPT (GPT-4) for accuracy assessment. The researchers examined 100 essays authored by English L2 learners, feeding them into ChatGPT with directives to find and classify grammatical errors on a sentence-by-sentence basis. Human coders subsequently assessed the accuracy of this error detection and classification, juxtaposing it with ChatGPT's analysis. The findings indicated a notably robust connection ($\rho = 0.97$) between ChatGPT's error detection and that of human coders, a consistency that persisted ($\rho = 0.94$) even after the coding was re-evaluated four months later to mitigate any potential bias from ChatGPT's original evaluations. The study is pioneering in its use of ChatGPT for accuracy assessment and its exhibition of high precision; nonetheless, it presents a methodological restriction by establishing ChatGPT as the primary benchmark for error detection, subsequently validated by human coders. This method unintentionally positions ChatGPT as the standard for accuracy, overlooking that the ultimate "correct" assessments in CAF measurements should preferably stem from human manual coding. This error raises concerns about the broader significance of the findings in evaluating the precision of automated systems for accuracy evaluation. Furthermore, the absence of a comparison with Grammarly, a key rival, indicates the need for further investigation.

Many researchers juxtaposed AWE with human evaluators. Almusharraf and Alotaibi (2022) assessed Grammarly's efficacy relative to human evaluators in identifying writing faults within a corpus of 197 essays authored by university students in Saudi Arabia. Rather than utilizing conventional accuracy metrics, such as mistake-free units or error counts per specified word count (Polio & Shea, 2014), the accuracy scores were determined by tallying the errors and averaging the error count across writing samples. The rectified errors were categorized into 25 kinds, and the frequency of each type was compared between human evaluators and Grammarly. Comparative findings revealed that Grammarly identified a markedly greater quantity of errors than human evaluators and exhibited consistent error identification across various essays. Grammarly, however, did not identify certain problems, especially those concerning possessives, comma splices, run-on sentences, and sentence cohesion, which necessitated contextual interpretation and linguistic complexity, capabilities inherent to human evaluators. A moderate connection existed between Grammarly and human evaluators regarding overall writing ratings ($\rho = 0.45$) and the quantity of errors detected ($\rho = 0.34$). The study yielded valuable findings; however, its generalizability was constrained by the atypical accuracy measures utilized and the restricted sample size, as the authors relied on a locally sourced dataset, leading to a small and homogeneous cohort of learners.

A study in Filipine investigated the impact of Artificial Intelligence (AI) on improving academic writing productivity using a pre-test-post-test quasi-experimental research method. The study used time series analysis to assess the efficacy of AI-driven tools in enhancing university students' writing skills. This research utilized a pre-test-post-test single-case study design to evaluate the efficacy of AI-driven writing tools on academic writing proficiency among Filipino ESL learners. Data were gathered at various intervals to monitor alterations in writing efficiency throughout time. The Meta AI was incorporated into the writing process to facilitate grammatical verification, stylistic recommendations, and content structuring. The analysis assessed the influence of AI on critical factors including writing speed, coherence, and error minimization. The results demonstrated a substantial enhancement in the writing disposition and proficiency of the experimental group, with considerable improvements in clarity and grammatical precision. Time series study demonstrated a steady enhancement in

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students' writing ability while utilizing AI tools, underscoring their value in academic settings. The study suggests that AI-driven applications enhance the writing process and offer dynamic feedback that fosters the development of proficient writing abilities. Recommendations advocate for the integration of Meta AI into school courses to improve students' writing skills and promote a more engaging learning atmosphere (Soriano et al., 2024).

## 2. Methodology

The objective of this study is to compare the effectiveness of ChatGPT and Meta AI in detecting morphosyntactic errors in the written text of BS Accounting student. Morphosyntactic errors, which involve mistakes in the grammar and syntax of sentences, can significantly impact the quality of written communication. In this chapter, the research methodology will be outlined, including the research design, participants, data collection, and analysis methods. The approach employed in this study ensures the reliability and validity of the results, providing a comparative analysis of the two AI systems in terms of their performance in grammatical error detection.

### 2.1.Research Design

This study adopts a qualitative research design, specifically focusing on content analysis methods. A content analysis technique is suitable as it allows for the description of error correction by both tools in this case, ChatGPT and Meta AI—in terms of their ability to detect and correct morphosyntactic errors in written text.

The study involves two primary phases: data collection and data analysis. In the data collection phase, a corpus of written texts by BS Accounting student is gathered and then processed through both AI tools. In the data analysis phase, the output from each AI system is compared and evaluated based on predefined criteria.

### 2.2.Participants

The participant in this study is BS Accounting student enrolled at a local university. The student has been selected using a purposive sampling technique, as the research aims to examine morphosyntactic errors specifically in the writing of accounting student.

### 2.3.Data Collection

Data for this study was a quiz of the subject History and Philosophy of Business taught at the Undergraduate level to the students enrolled in the first semester.

The topic of the quiz was “Factors affecting the Entrepreneurship business in Pakistan”. The student wrote the answer in his own words as the question was not based on memorized expressions. The student was instructed to write essays and assignments under exam conditions to ensure that the writing was spontaneous and reflective of his individual language abilities.

Once the text was collected, it was formatted for input into the AI systems. The document was then fed into both ChatGPT and Meta AI for error detection. Both AI models were used to identify and flag morphosyntactic errors, including issues with subject-verb agreement, word order, tense, preposition use, and other grammatical or syntactical inconsistencies. The AI systems were used in their standard configurations—ChatGPT in a zero-shot learning configuration and Meta AI in a pre-trained model setup for grammatical error correction.

### 2.4.AI Systems and Error Detection

#### 2.4.1. ChatGPT

ChatGPT is based on the GPT-3.5 architecture and is known for its natural language processing capabilities. In this study, ChatGPT was used in a zero-shot configuration, meaning that it was given no prior examples of errors but was instead expected to detect and correct errors based on its general language understanding. ChatGPT was chosen for its capacity to perform context-based corrections and its high fluency in rewriting sentences to make them more grammatically correct. The tool is particularly noted for its ability to over-correct, meaning it can sometimes make changes that are unnecessary but contribute to fluency.

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### 2.4.2. Meta AI

Meta AI, developed by Facebook's AI research division, was also employed for error detection. Similar to ChatGPT, Meta AI uses advanced NLP techniques but may differ in its error-detection mechanisms and its approach to handling context and fluency. Meta AI was tested in a pre-trained configuration, with the tool's grammar correction model being used to process the written texts. The system is optimized for detecting errors that typically occur in non-native English texts, making it well-suited for the student samples in this study.

### 2.5.Error Types Focused in the Study

The primary focus of error detection in this study was on morphosyntactic errors, which involve grammatical and syntactical mistakes. Morphosyntactic errors cover a range of issues in both morphology (word formation) and syntax (sentence structure and word order). Here are some common types:

1. **Subject-Verb Agreement Errors**
   - Mistakes in aligning subjects and verbs, especially in terms of number (singular/plural) or person.
   - *Example*: "She go to school" instead of "She goes to school."
2. **Tense Errors**
   - Incorrect verb tense or inappropriate tense shifts that make the sentence unclear or incorrect.
   - *Example*: "Yesterday, he go to the market" instead of "Yesterday, he went to the market."
3. **Pluralization Errors**
   - Incorrect use of singular and plural forms, often with irregular nouns or uncountable nouns.
   - *Example*: "She has many friend" instead of "She has many friends."
4. **Article and Determiner Errors**
   - Misuse or omission of articles ("a," "an," "the") and determiners ("some," "any," "few").
   - *Example*: "She bought book" instead of "She bought a book."
5. **Preposition Errors**
   - Incorrect use of prepositions, affecting sentence meaning or flow.
   - *Example*: "She is good in math" instead of "She is good at math."
6. **Pronoun Errors**
   - Errors with pronoun form, agreement, or reference.
   - *Example*: "Me and him went to the store" instead of "He and I went to the store."
7. **Word Order Errors**
   - Incorrect arrangement of words in a sentence, often affecting clarity and emphasis.
   - *Example*: "Quickly she left the room" instead of "She left the room quickly."
8. **Inflection Errors**
   - Incorrect word endings or lack of appropriate morphological changes (e.g., missing "-s" for plurals, "-ed" for past tense).
   - *Example*: "The boy kick the ball" instead of "The boy kicked the ball."
9. **Auxiliary and Modal Verb Errors**
   - Incorrect use of auxiliary verbs ("is," "are," "have") or modal verbs ("can," "will," "must").
   - *Example*: "She can goes there" instead of "She can go there."
10. **Comparative and Superlative Errors**
   - Incorrect forms in comparisons, often due to incorrect suffixes or modifiers.

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- *Example*: "She is more taller than him" instead of "She is taller than him."

11. **Negation Errors**
    - Mistakes in forming negatives, often involving double negatives or incorrect placement of "not."
    - *Example*: "I don't know nothing" instead of "I don't know anything."
12. **Compound and Complex Sentence Errors**
    - Errors in combining clauses, leading to run-on sentences or sentence fragments.
    - *Example*: "She went to the store, and bought milk went home" instead of "She went to the store, bought milk, and went home."
13. **Passive Voice Errors**
    - Incorrect formation or overuse of passive structures, which can obscure meaning or misrepresent emphasis.
    - *Example*: "Mistakes are happened" instead of "Mistakes happened" or "Mistakes were made."

Understanding these errors can be essential for improving grammar and sentence clarity in both written and spoken language.

### 2.6.Data Analysis and Theoretical Framework

Once the data were collected, the output from ChatGPT and Meta AI were analyzed and compared. The errors were categorized using the surface technique developed by Dulay et al. (1982) and an adaption of linguistic category developed by Gayo and Widodo (2018). The data collection and analysis were carried out using Keshavarz's (2012) methodology of error analysis. The analysis consisted of qualitative assessments:

### 2.7.Limitations

The methodology has certain limitations. Firstly, the study only focuses on written text from BS Accounting student, which may not be fully representative of all ESL students. Secondly, the evaluation of AI models is confined to the specific types of morphosyntactic errors listed above, and it does not encompass other aspects of language use, such as coherence or argument structure. Additionally, the study's reliance on AI systems to detect and correct errors may introduce biases based on the inherent strengths and weaknesses of each system's algorithm.

## 3. Analysis and Discussion:

This section presents the errors identified by both AI tools and the corrections suggested by them followed by comparing both tools' patterns and approaches towards identification and correction of morphosyntactic errors.

### 3.1.ChatGPT Morphosyntactic Error Analysis:

Here are the morphosyntactic errors in the given text along with suggested corrections:

1. **"Economic affect"**
    - *Error*: "Affect" is incorrectly used here. The correct term is "Effect" (noun) instead of "Affect" (verb).
    - *Correction*: "Economic effect"
2. **"Due to poor economy"**
    - *Error*: "poor economy" should be "a poor economy" to include an article.
    - *Correction*: "Due to a poor economy"
3. **"going beauty parlour"**
    - *Error*: This phrase is missing "to" and "the."
    - *Correction*: "going to the beauty parlour"
4. **"So, in Pakistan they are not much successful."**
    - *Error*: "Much" is incorrect here; "very" is more appropriate. Also, it's unclear what "they" refers to.
    - *Correction*: "So, in Pakistan, beauty parlours are not very successful."

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5. **"Social affect"**
   - *Error*: Again, "affect" should be "effect."
   - *Correction*: "Social effect"
6. **"bride usually get ready from parlours."**
   - *Error*: Subject-verb agreement ("bride" is singular, so the verb should be "gets").
   - *Correction*: "Nowadays, brides usually get ready at parlours."
7. **"Technological affect"**
   - *Error*: "Affect" should be "Effect."
   - *Correction*: "Technological effect"
8. **"beauty parlours have affected in such a way"**
   - *Error*: The phrase is missing an object (what have they affected?).
   - *Correction*: "Technologically, beauty parlours have been affected in such a way"
9. **"Legal affect"**
   - *Error*: "Affect" should be "Effect."
   - *Correction*: "Legal effect"
10. **"if the government introduces the law"**
    - *Error*: This should be "a law" instead of "the law."
    - *Correction*: "if the government introduces a law"
11. **"then she can take this opportunity."**
    - *Error*: It's unclear who "she" refers to, which affects clarity.
    - *Correction*: Specify the subject, for example, "then a trained beautician can take this opportunity."
12. **"whoever want to start this business, must fulfill the criteria."**
    - *Error*: "Want" should be "wants" to agree with "whoever."
    - *Correction*: "whoever wants to start this business must fulfill the criteria."
13. **"Political affect"**
    - *Error*: Again, "Affect" should be "Effect."
    - *Correction*: "Political effect"
14. **"Conservative government can introduce policy"**
    - *Error*: "Policy" needs an article, and "Conservative" should be "A conservative."
    - *Correction*: "A conservative government can introduce a policy"
15. **"Environmental affect"**
    - *Error*: "Affect" should be "Effect."
    - *Correction*: "Environmental effect"
16. **"Producing those products which are not harmful for people."**
    - *Error*: "Which" should be "that," and "for" should be "to."
    - *Correction*: "Producing products that are not harmful to people."

**3.2.Meta AI Morphosyntactic Error Analysis:**

Here are the morphosyntactic errors identified in the text:

**Economic affect**

1. "Economic affect" should be "Economic impact" or "Economic effects" (noun error)
2. "Due to poor economy" should be "Due to a poor economy" (article error)
3. "people usually prefer home remedies instead of going beauty parlour" should be "people usually prefer home remedies instead of going to a beauty parlour" (preposition error)

**Social affect**

1. "Social affect" should be "Social impact" or "Social effects" (noun error)

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2. "Beauty parlours have changed the ideas and thoughts of people" is a complete sentence, but consider rephrasing for clarity: "Beauty parlours have influenced people's ideas and thoughts."
3. "Nowadays, bride usually get ready from parlours" should be "Nowadays, brides usually get ready at parlours" (subject-verb agreement error, preposition error)

**Technological affect**

1. "Technological affect" should be "Technological impact" or "Technological effects" (noun error)
2. "beauty parlours have affected in such a way" should be "beauty parlours have had an impact in such a way" (verb error)
3. "that now skin care remedies are available online" is a complete sentence, but consider rephrasing for clarity: "as a result, skin care remedies are now available online."

**Legal affect**

1. "Legal affect" should be "Legal impact" or "Legal effects" (noun error)
2. "if the government introduces the law" should be "if the government were to introduce a law" (conditional tense error)
3. "that only those who have foreign training can start a business" should be "that only those with foreign training can start a business" (phrase rewording)
4. "then she can take this opportunity" is unclear; consider rephrasing: "then individuals can seize this opportunity."

**Political affect**

1. "Political affect" should be "Political impact" or "Political effects" (noun error)
2. "Conservative government can introduce policy" should be "A conservative government may introduce policies" (article error, verb tense error)
3. "which can demotivate beauticians" is unclear; consider rephrasing: "that could discourage beauticians."

**Environmental affect**

1. "Environmental affect" should be "Environmental impact" or "Environmental effects" (noun error)
2. "Producing those products which are not harmful for people" is unclear; consider rephrasing: "Producing products that are harmless to people."

**Other suggestions:**

- Use transitional phrases to connect ideas between sentences.
- Vary sentence structure to improve readability.
- Consider adding specific examples or data to support claims.
- Proofread for spelling and punctuation errors.

**Corrected text:**

**Economic Impact**

Due to a poor economy, people usually prefer home remedies instead of going to a beauty parlour. In Pakistan, this trend affects the success of beauty parlours.

**Social Impact**

Beauty parlours have influenced people's ideas and thoughts. Nowadays, brides usually get ready at parlours.

**Technological Impact**

Beauty parlours have had a significant impact, making skin care remedies available online.

**Legal Impact**

If the government were to introduce a law requiring foreign training to start a beauty business, individuals could seize this opportunity.

**Political Impact**

A conservative government may introduce policies that could discourage beauticians.

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**Environmental Impact**

Beauty parlours can produce products that are harmless to people.

### 3.3.Comparison of Error Detection: ChatGPT vs. Meta AI:

The objective of this section is to assess the performance of both AI systems in identifying and correcting grammatical errors that affect the clarity and accuracy of students' texts. By comparing the types and frequencies of errors each system detects, as well as the accuracy and appropriateness of their suggested corrections, this comparison aims to highlight the strengths and limitations of each AI system.

#### 3.3.1. Noun and Verb Errors:

ChatGPT and Meta AI both successfully identified issues with noun and verb usage, such as the incorrect use of "affect" instead of "effect." However, there were notable differences in their approaches:

- ChatGPT consistently suggested "effect" as the correction for "affect" in phrases like "Economic affect" and "Social affect." This correction aligns with standard grammar, as “effect” is the noun form needed in these contexts. However, Meta AI offered alternative suggestions such as "impact" or "effects," providing a broader range of options. This alternative phrasing ("impact") reflects a more nuanced understanding of terminology, potentially making Meta AI's correction slightly more adaptable in professional or academic contexts.
- In the sentence "Economic affect," Meta AI's suggestion of "Economic impact" may be preferred in formal writing, where "impact" could be more contextually appropriate. ChatGPT's straightforward correction of "Economic effect" maintains grammatical accuracy but may lack the contextual sophistication of Meta AI's options.

#### 3.3.2. Article Errors:

Both AI systems detected errors involving missing articles. For instance, both ChatGPT and Meta AI correctly identified the need for an article in the phrase "Due to poor economy," suggesting "Due to a poor economy."

- ChatGPT maintained a straightforward approach, focusing solely on grammatical correctness by adding "a."
- Meta AI, however, identified the missing article and additionally suggested rephrasing to enhance clarity and readability. Meta AI's flexibility in offering additional phrasing options could provide students with a more comprehensive approach to language use.

This distinction highlights Meta AI’s tendency to prioritize both accuracy and stylistic improvements, potentially making it more effective for students seeking advanced language refinement.

#### 3.3.3. Preposition Errors:

Preposition errors, often challenging for ESL students, were detected differently by each system. In the sentence "people usually prefer home remedies instead of going beauty parlour," Meta AI identified the missing prepositions and recommended the phrase "going to a beauty parlour." ChatGPT also suggested the necessary preposition, with the correction "going to the beauty parlour."

- ChatGPT demonstrated a strong focus on grammatical correctness by directly identifying missing prepositions.
- Meta AI not only added the correct prepositions but occasionally offered variations to enhance contextual appropriateness.

In cases involving prepositions, Meta AI’s suggestions occasionally resulted in more natural-sounding phrases, enhancing the overall coherence and readability.

#### 3.3.4. Subject-Verb Agreement Errors:

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Subject-verb agreement is a frequent area of difficulty, and both systems performed well in identifying related errors. For instance, both identified the subject-verb agreement error in "bride usually get ready from parlours," suggesting the correct form "brides usually get ready at parlours."

- ChatGPT provided direct grammatical corrections without altering the sentence structure.
- Meta AI offered similar corrections but occasionally suggested additional context, such as rephrasing to clarify meaning and improve fluency.

The ability of both systems to accurately identify subject-verb agreement errors suggests that either tool could be beneficial for students needing support with basic grammar. However, Meta AI's rephrasing options may make it more suitable for students aiming to improve sentence fluency and readability.

#### 3.3.5. Conditional Tense Errors:

Meta AI demonstrated an advantage in identifying and correcting errors involving conditional tense. In the sentence "if the government introduces the law," Meta AI recommended a more accurate conditional form, "if the government were to introduce a law," showing its sensitivity to nuanced grammatical structures.

- Meta AI's correction aligns with formal English, where hypothetical or conditional statements often require subjunctive forms.
- ChatGPT identified the missing article but did not adjust the tense, missing the opportunity to clarify the hypothetical context fully.

Meta AI's accuracy in handling conditional tense errors suggests it may be more adept at addressing complex grammar, making it suitable for students seeking advanced error correction.

#### 3.3.6. Pronoun Clarity and Referencing:

Both systems struggled to address unclear pronoun usage in sentences like "then she can take this opportunity," where the pronoun "she" lacked a clear referent. However, Meta AI suggested rephrasing, for example, "individuals can seize this opportunity," to avoid ambiguous pronouns.

- ChatGPT often maintained the original pronoun structure, focusing solely on grammar, whereas Meta AI aimed to enhance clarity by eliminating ambiguous pronouns altogether.

Meta AI's approach could be especially beneficial in academic and professional contexts where clarity and precision are critical. ChatGPT's inability to detect pronoun clarity issues indicates a limitation in its error detection scope.

#### 3.3.7. Additional Observations on Style and Readability:

Meta AI made suggestions beyond simple grammar corrections, including stylistic changes to improve sentence flow, cohesion, and readability. For instance:

- Meta AI recommended alternative phrasing such as "Beauty parlours have influenced people's ideas and thoughts," which enhances readability over ChatGPT's simpler corrections.
- Meta AI advised using transitional phrases, adding coherence to the text, and varying sentence structure, which could contribute to higher-level language refinement.

In contrast, ChatGPT focused on specific, isolated corrections without considering broader stylistic improvements, aligning more with a tool that addresses elementary grammar rather than advanced language refinement.

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**Discussion:**

This comparative analysis reveals that both ChatGPT and Meta AI are effective in identifying common morphosyntactic errors, such as article omissions, subject-verb agreement, and noun-verb misusage. However, each system demonstrates distinct strengths and limitations:

- ChatGPT is precise and consistent in identifying basic grammatical errors but does not provide stylistic or contextual enhancements. Its focus on fundamental grammar correction may suit students at beginner levels who need straightforward, rule-based corrections.
- Meta AI, in contrast, goes beyond simple error detection by suggesting rephrasing options and addressing issues like conditional tense, stylistic coherence, and pronoun clarity. This makes Meta AI particularly suitable for students seeking both grammatical correction and guidance on language refinement.

Meta AI's more nuanced understanding and contextual suggestions highlight its potential as a comprehensive tool for improving academic writing, especially in advanced ESL settings. ChatGPT's straightforward approach, on the other hand, may be more accessible for users focused primarily on grammatical correctness without advanced stylistic considerations.

In summary, while both ChatGPT and Meta AI can effectively detect morphosyntactic errors, Meta AI offers a broader range of corrections that encompass both grammar and style, enhancing readability and contextual clarity. This makes Meta AI a more robust tool for advanced error detection, particularly in academic writing, where both accuracy and stylistic sophistication are crucial. ChatGPT's role, however, may remain valuable for simpler, grammar-focused corrections, especially for students who need immediate and direct error identification without stylistic adjustments. This comparative analysis suggests that a combined approach, using both systems in tandem, could offer comprehensive support for students at various proficiency levels.

**4. Conclusion:**

The findings of this study contribute valuable insights into the comparative effectiveness of AI-based tools—specifically ChatGPT and Meta AI—in identifying and correcting morphosyntactic errors within academic writing by non-native English speakers. By analyzing sample texts from a BS Accounting student, the study highlights the distinct strengths and limitations of each AI model, emphasizing their roles and potential improvements in supporting academic language proficiency.

ChatGPT and Meta AI both demonstrated competence in detecting common morphosyntactic errors, such as noun-verb agreement, article usage, and basic sentence structure issues. ChatGPT proved particularly effective in identifying straightforward grammatical errors and applying rule-based corrections, which may be suitable for learners at introductory stages or those focused on foundational language accuracy. However, its primary limitation lies in its narrower scope, as it often fails to provide stylistic enhancements or rephrase sentences for clarity and coherence. This narrower approach may limit ChatGPT's usability for students requiring not just grammatical accuracy but also stylistic polish and contextual appropriateness in their academic writing.

In contrast, Meta AI offers a more nuanced understanding of the context and an ability to suggest not only grammatical corrections but also stylistic refinements. Meta AI's rephrasing suggestions, contextual improvements, and attention to sentence flow make it particularly advantageous for advanced ESL students or individuals engaged in academic writing who seek to improve readability alongside grammatical accuracy. Its suggestions extend beyond error detection to include stylistic feedback, which could enhance clarity and alignment with academic writing standards. Furthermore, Meta AI's capacity to address complex grammar

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issues, such as conditional tense and pronoun referencing, positions it as a valuable tool for students aiming for a higher level of language proficiency.

The differences in error detection and feedback quality between ChatGPT and Meta AI underscore the importance of selecting AI tools that align with the specific needs and proficiency levels of users. For educators and researchers, these findings reveal the potential for integrating such AI models into language support services, with Meta AI showing particular promise in higher-level academic contexts. The implications for AI developers are also notable: enhancing AI models to handle complex linguistic issues, such as cross-sentence boundary errors and nuanced syntactic structures, would significantly increase their utility across diverse fields.

Overall, while both ChatGPT and Meta AI contribute positively to language learning and academic writing improvement, Meta AI's broader error-correction capabilities and stylistic enhancements suggest that it currently offers a more comprehensive solution for students seeking advanced language support. However, combining both tools may provide the most beneficial approach, enabling users to first utilize ChatGPT for basic grammar checks and subsequently Meta AI for advanced refinements. Future research may consider examining these models across different disciplines and text complexities, further clarifying the ways AI-driven tools can support writing proficiency across educational and professional contexts.

In conclusion, this study affirms the value of AI-based language assistance for students, educators, and developers alike. The nuanced capabilities of ChatGPT and Meta AI, along with identified areas for development, offer a roadmap for the ongoing evolution of AI in supporting linguistic competence and academic success. By understanding the current capacities of these tools, educational institutions and developers can better leverage AI technologies to address the language needs of diverse student populations, ultimately enhancing the quality of academic writing and language learning.

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**Annexure:**

The annexure includes the student's text analyzed in this study:

Economic affect

Due to poor economy, people usually prefer home remedies instead of going beauty parlour. So, in Pakistan they are not much successful.

Social affect

Beauty parlours have changed the ideas and thoughts of people. Nowadays, bride usually get ready from parlours.

Technological affect

Technologically, beauty parlours have affected in such a way that now skin care remedies are available online.

Legal affect

In Pakistan, if the government introduces the law that only those who have foreign training can start a business then she can take this opportunity. In this way, whoever want to start this business, must fulfill the criteria.

Political affect

Conservative government can introduce policy which can demotivate beauticians.

Environmental affect

Producing those products which are not harmful for people.