

# Content Analysis on Assignments Using Artificial Intelligence

Hazidi Abdul Hamid<sup>1\*</sup>

<sup>1</sup> Faculty of Education, Open University Malaysia, Malaysia.

\*Corresponding author. Email: hazidi@oum.edu.my

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## Abstract

*The rise of artificial intelligence (AI) systems, particularly the chatbot and virtual assistant ChatGPT, has been recently prominent in the media. Many organisations, including educational institutions, have been quick to embrace AI but not without trepidation. This paper addresses the possibility of teachers recognising the work of AI if or when students hand in their academic assignments. Bloom's Taxonomy guides the inquiry method employed in this paper for the framing of questions that are prompted to ChatGPT. ChatGPT's output and exchanges are then analysed regarding the accuracy of the information they provide and the discursal appropriateness of these responses to the questions asked. The findings show that ChatGPT can produce output that is accurate and appropriate at all levels of the cognitive domain of Bloom's Taxonomy. ChatGPT's ability to provide answers that address questions directed to it in a manner that is appropriate to the discourse type, and include information that is both appropriate to the exchange and context, would make it difficult for teachers to differentiate between AI- and human-generated output, which leads to concerns and challenges in assessing students' work, particularly in cases where students' academic honesty is questionable. The findings also highlight concerns relating to the authenticity of students' academic writing.*

**Keywords:** artificial intelligence, ChatGPT, education, innovative pedagogy, online, open and distance learning, teachers, technology

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## 1. Introduction

Artificial intelligence (henceforth, AI) recently became popular and promises to change the way we live and work. To educators, AI poses new opportunities and challenges. This paper explores one specific challenge: telling the difference between the work of a human student and that of AI.

Machines exist that claim to be able to accurately identify the work of AI, but they are expensive and not affordable to the average teacher. Moreover, these are machines built to detect the work of other machines, but as both are man-made machines, which can we trust? Perhaps it would be better for human beings to be able to recognise the work of AI independently rather than rely on machines to do it for us. However, to do this we will need a way to examine and guide our efforts. One possible tool is Bloom's Taxonomy, specifically its cognitive domain. A chatbot and virtual assistant like ChatGPT could be asked to perform cognitive acts at different levels of cognition (i.e., knowing, understanding, applying, analysing, judging, and creating) in the Taxonomy. The outcome could then be examined to identify the responses that are discernibly not human. If this task is unfeasible, this would demonstrate that human teachers may have problems recognising an AI work if it is handed in as an academic assignment in place of the students' own efforts.

The ability to discern the human product from the AI product is particularly important in open and distance learning (henceforth, ODL), which is generally information technology (henceforth, IT) intensive. This is particularly so in ODL institutions that have migrated to online classes, a common measure taken during the Covid-19 pandemic that has required students to be relatively IT literate. However, the extent of students' IT literacy is arguable. In this context, there is a push-and-pull effect. On one hand, ODL institutions tend to cater to working-adult students who would welcome a device that provides them with easy and accessible solutions. On the other hand, there may be a learning curve involved in using this device that would deter students from it. However, ChatGPT is trained on natural language, and thanks to its user-friendliness, it may be easier for students to learn to use an AI like ChatGPT than other types of IT tools. This makes it more important for educators to be able to recognise the work of AI.

To examine the extent of this problem, this study decided to engage an AI tool (i.e., ChatGPT4) by asking it questions based on the cognitive domain of Bloom's Taxonomy. Other domains will be examined in subsequent works. This is significantly different from other works read thus far (see below) in the following ways:

- i. A majority of other works have discussed AI in the context of human users, whereas this research engages ChatGPT4 itself to ask questions and examine its answers based on Bloom's Taxonomy.
- ii. This research engages ChatGPT4 in conversation-styled interactions as suggested by OpenAI (the creators and developers of ChatGPT).

The content of ChatGPT's responses are analysed to determine if it has performed the task of answering the questions and requests presented to it in a way that:

- i. Fulfils the specific demands of the request or question.
- ii. Demonstrates that the 'respondent' answering the questions has sufficiently understood the question or request to provide coherent responses that are similar enough to possible human answers as to make it harder for humans to differentiate between AI and human output.
- iii. Demonstrates consciousness of the continuity in the sequence of questions and requests. In other words, can ChatGPT keep the conversation going based on one starting point of inquiry?

The objective of this paper is to explore the problem that teachers may face in identifying if a piece of work submitted by students is written by the student or is actually the output of AI, specifically ChatGPT. To do this, this study will attempt to determine if ChatGPT's responses to questions posed, or requests or demands directed to it, fulfil the specific demands of said questions or requests. This is achieved by determining if the responses or answers provided by ChatGPT demonstrate that it sufficiently understands the questions or requests to seem coherent and appropriate enough to appear adequately human-like, as though these responses had been written by a human author. Moreover, by examining if the sequence of questions/requests and answers/responses is coherent, the study could demonstrate that ChatGPT can seem 'conscious' of the continuity in the conversation.

The questions or requests will be arranged in an ascending sequence according to the levels of thinking as outlined by Bloom's Taxonomy. This paper will show that while telling the difference will be difficult, this can be a boon rather than bane in an educational context. This research is exploratory in nature, in that it is aimed at ascertaining the possibility and nature of the problem. This, in turn, may provide the basis for a more rigorous examination of the issue, with a focus on improved veracity.

## 2. Literature Review

### 2.1. AI in Brief

The notion of man-made beings pre-exists modern media. In the past, they have often been depicted in literature and pop culture as malevolent (e.g., the golem from the 1818 classic *Frankenstein*) or incomplete

(e.g., Pinocchio from 1883's *The Adventures of Pinocchio*, Andrew from the 1992 novel *The Positronic Man* and 1999 movie *Bicentennial Man*, and Data from *Star Trek: The Next Generation*). In 1956, the Dartmouth Conference established AI as a field of study, calling AI tools 'thinking machines'. However, the generally high costs involved in AI development limited its advancement until the 1980s when technology became more affordable and accessible to the public. Advancing computing power allowed for the development of expert systems, i.e., rule-based knowledge tools designed to solve specific problems in many areas including education and healthcare.

OpenAI, the American AI research company behind ChatGPT, released a research paper introducing the GPT-3 model (GPT stands for Generative Pre-trained Transformer) on 3 June 2020. Based on GPT-3, ChatGPT, a language model fine-tuned for interactive and conversational tasks, has since been made available to the public. At the time of writing, ChatGPT is available as ChatGPT3.5 (free access), and ChatGPT4 (paid access), which includes the image generator Dall-E. The ChatGPT series of language models are developed for natural language processing (NLP) and trained to understand and generate human-like texts. As its training progresses, it learns the nuances of human language and textual communication. ChatGPT's objective is to make language understanding and generation capabilities accessible to users for a broad range of applications.

## 2.2. Bloom's Taxonomy

The researcher's institution and the Malaysian Qualifications Agency categorise educational goals based on Bloom's Taxonomy. This taxonomy serves as the core tool used by educators to structure and assess learning outcomes. It has three main domains: cognitive, affective, and psychomotor. This paper will focus only on the cognitive domain.

Bloom (1956) originally categorised the cognitive domain into six hierarchical orders of thinking:

- i. Knowledge
- ii. Comprehension
- iii. Application
- iv. Analysis
- v. Synthesis
- vi. Evaluation

These hierarchical orders were later renamed and reordered by Anderson and Krathwohl (2001):

- i. Remembering
- ii. Understanding
- iii. Applying
- iv. Analysing
- v. Evaluating
- vi. Creating

These hierarchies are understood as representing levels of increasingly difficult cognitive tasks. This paper questions the notion that only human beings are capable of performing higher-order thinking tasks. This has been similarly examined in previous studies, such as Denny et al. (2023), who conducted a blind evaluation on the correctness and helpfulness of resources produced by students and those generated by AI. They found that resources produced by both are of equivalent quality and thus can equally serve as supplementary material in the educational context. Similarly, Barag et al. (2023) compared human-generated and AI-generated articles, and found that in terms of accuracy of information and other factors, the articles were comparable, thus suggesting that both human- and AI-generated products can be considered to be of equivalent quality.

The researcher views these findings with some degree of scepticism and opts to examine the AI-generated texts in a more direct manner, i.e., by examining them in direct exchange rather than examining generated products as in the case of the two papers described above.

### 2.3. AI, ChatGPT, and the Teacher

Denning's 2023 paper focused on teachers' concerns surrounding AI. The teachers' responses in his study led Denning to list trust, authorship, education, jobs, teaching, and inclusion as their primary concerns. While all six are pertinent to teaching in ODL, this paper will concentrate on just two, i.e., trust and authorship.

Trust, according to Denning (2023), is an issue because AI is essentially clueless in that it cannot differentiate between sense and nonsense. Although AI does understand what it is saying, it is a predictive machine that provides answer by taking cues from prompts and extracting relevant information from its database. This means that an AI tool cannot differentiate sense from nonsense if the nonsense is presented as sensible in the AI's database.

The issue of authorship is also concerning because AI has no inherent affinity for either truth or falsehood. AI cannot recognise either because it does not actually know what they are. This is because AI is not all-encompassing in that it can only form abstractions on the conversations that are used to train it. Denning went further to say that "the road to trustworthy uses of this technology will be long."

Halaweh (2023) examined the use of ChatGPT in education whilst seeking strategies suitable for the responsible implementation of contemporary educational technology. He describes ChatGPT as "an AI-based tool ... which enables texts generation based on user prompts." He then offers a perspective that appears contrarian: "It is a myth that disclosing the use of ChatGPT-3 ... would be considered plagiarism, ... plagiarism actually refers to presenting someone else's ideas as your own without giving proper credit to the source. Therefore, when using GPT-3, authors or students should make it clear that the model was used and cite or reference it appropriately." Halaweh (2023) thus argues for the adoption of ChatGPT, as ChatGPT "produces outputs of a high quality that have a high probability of passing plagiarism detection software." Moreover, ChatGPT is easily accessible (to both students and staff), so "universities should not prevent or ignore its use. Rather, regulate and utilize it responsibly." This includes developing, among the students and staff, the skills to use ChatGPT (and other AI models) in making presentations and defences, as well as in evaluating, correcting, and developing their own skills in these areas in the studying process.

Halaweh's optimistic sentiment is echoed by Langreo (2023), who is "sceptical but hopeful ... that the Doomsday scenarios aren't likely but not impossible." Langreo presents a solution to allay fears of possible inaccuracies, which is a concern with ChatGPT today. The solution is to create 'walled garden' AI, which are trained based on content vetted by its creators. Langreo sees the advent and rise of ChatGPT as an opportunity for educators to "evolve for a world of lifelong learning." There is extensive reading already available as demonstrated by Baskara and Mukarto (2023).

To help compare human thought and AI systems, Fuchs (2021) proposes an anthropomorphic view of consciousness to establish a notion of intelligence that cannot be reduced to information processing. In decision-making, Porayska-Pomsta and Rajendran (2019) suggest we look at the role of biases in AI algorithms and human-controlled systems. They highlight that empathy and moral judgment is present in humans but absent in AI.

Similarly, Iqbal et al. (2021) engages students to discuss the challenges and opportunities in implementing AI in medical education, while Preiksaitis et al. (2023) questions the possibility of using ChatGPT to write recommendation letters for academics in medicine. In the latter study, they found that only 59.4% of the respondents were able to identify recommendation letters written by AI.

## 3. Research Method

This study employs a basic content analysis methodology. Rather than engaging people who use ChatGPT, the researcher has chosen to engage ChatGPT directly by asking it questions about remedial English in increasingly difficult levels of order of thinking based on Bloom's Taxonomy. ChatGPT's

output are then analysed to determine the extent to which it manages to fulfil the question's requirements. The order of thinking will be taken from both the original and amended versions of the cognitive domain of Bloom's Taxonomy.

The choice of focusing on ChatGPT is guided by the prominence ChatGPT has had in literature on AI, which many studies have opted to address exclusively. ChatGPT brings “ethical and social considerations that must be addressed. (Thus) the need for further research in this area cannot be overstated. Such research would provide insight into the potential benefits and challenges of using ChatGPT in language learning and facilitate the development of methods and tools that ensure its safe, effective, and ethical use” (Baskara & Mukarto, 2023).

ChatGPT is also prominent in the “rapid transformations due to the emergence of new technologies (ChatGPT) and the resultant demand for a different set of skills than those of previous generations” (Halaweh, 2023). In this context, “students will be expected to demonstrate more critical thinking in their evaluation of information, as well as to develop and present new ideas” (Halaweh, 2023, p. 9). Therein lies the potential problem of less scrupulous students relying on ChatGPT to produce their work rather than producing it themselves. This study presents tasks to ChatGPT at different levels of the cognitive domain of Bloom's Taxonomy to show that ChatGPT can indeed complete the presented tasks. This, in turn, is presumed to make it difficult for educators to differentiate between the work of actual students and those produced by ChatGPT.

The questions and requests posed to ChatGPT are presented in ascending order following the levels of the cognitive domain of Bloom's Taxonomy:

Domain	Level	Explanation
Remembering/Knowledge	1	This is to show that ChatGPT can provide requested information or fulfil demands for information on the topic of the question or request.
Understanding	2	This is to show that ChatGPT can demonstrate a level of comprehension of the information or facts that it presents in response to the questions posed to it or requests made to it.
Application/Synthesising	3	This is to show that ChatGPT can display the ability to combine information presented in response to the questions or requests to form outputs that correspond to the line of questioning or train of thought in the conversation.
Analysing	4	This is to show that ChatGPT can examine its own output and the questions or requests to perform tasks such as contextualising its answers or responses.
Judging/Evaluation	5	This shows that ChatGPT can examine any list of related items and place them in a hierarchy according to a hierarchy discussed in the conversation.
Creating	6	In later versions of Bloom's Taxonomy, creating is the highest level of the cognitive domain. At this level, ChatGPT needs to present an output that is “new.”

#### 4. Data Analysis

This section contains the actual conversation the researcher had with ChatGPT, in which the questions were based on verbs linked to Bloom's Taxonomy's levels of thinking in the cognitive domain, which comprise the following: remembering, understanding, applying, analysing, evaluating, and finally, creating. Using the revised list of verbs from 2023, the conversation topic chosen was Remedial English for Young Learners. ChatGPT was engaged with the following plugins: ScholarAI, Scholar Assist, and Research by Vector. All these plugins are designed to enhance ChatGPT's ability to access academic material for the best possible outcome.

## 4.1. Remembering

Remembering, or knowing, is the first level of the cognitive domain of Bloom's Taxonomy. To prove that ChatGPT remembers, this study will investigate if ChatGPT can maintain a conversation based on earlier given information or maintain a conversation on the same topic or thread. ChatGPT is expected to remember what is being talked about throughout the conversation.

Questions based on knowledge or remembering to use the following verbs: list, describe, identify, name, locate, find, and define.

### 4.1.1. Knowledge

#### *Prompt*

Can you define remedial English for young learners?

#### *ChatGPT's answer*

Certainly. In the context of teaching English as a second language, particularly for young learners, "remedial English" refers to instructional approaches and educational interventions designed to assist students who are experiencing difficulties in acquiring proficiency in English. These difficulties might be in various aspects such as reading, writing, speaking, or listening skills.

#### **The key characteristics of remedial English for young learners include:**

**Diagnostic Assessment:** Initially, educators conduct assessments to identify specific areas where a student is struggling. This could involve tests in reading comprehension, vocabulary, grammar, or oral communication skills.

**Targeted Instruction:** Based on the assessment, instruction is tailored to address the specific needs of the student. For instance, if a child struggles with reading comprehension, the remedial program would focus on enhancing these skills.

**Small Group or One-on-One Sessions:** Remedial education often takes place in smaller groups or individual sessions to provide focused attention and support.

**Interactive and Engaging Methods:** Young learners benefit from interactive and engaging teaching methods. This might include games, multimedia resources, and hands-on activities that make learning more appealing and less intimidating.

**Building Basic Skills:** The focus is often on foundational language skills. For young learners, this might mean basic vocabulary, simple sentence structures, and fundamental grammar.

**Regular Feedback and Support:** Continuous feedback is crucial in remedial education. It helps students understand their progress and areas needing improvement.

**Inclusion of Cultural and Linguistic Contexts:** It's important to consider learners' cultural and linguistic backgrounds, especially in ESL settings. Remedial programs might include content that is culturally relevant and linguistically accessible.

**Parental Involvement:** It can be beneficial to involve parents in the remedial process, especially for young learners. This might include providing strategies for supporting English learning at home. You might appreciate that remedial English is not just about addressing deficits. It's also about recognizing and building upon the unique linguistic and cultural resources that each child brings to the classroom. The goal is to create a supportive learning environment that acknowledges diversity and fosters language development holistically.

#### *Commentary by the Researcher*

In terms of memory, it is hard to surpass AI's capacity to remember information. As demonstrated in the exchange above, ChatGPT has the ability to recall information with precision. Moreover, the AI

remembers the interlocutor by referring to the interlocutor's profession and interests. The AI has the interlocutor's account information.

Thus, remembering is not a good category for differentiating between an AI product and a human product. Moreover, human memory is more unpredictable because we cannot know what a person remembers and what he or she does not. If a double-blind test is done, then the distinction becomes even more apparent because we will fail to discern what a person 'should' remember and what information has not been fed to the AI's database.

## 4.2. Understanding

Understanding or comprehension is the ability to extract meaning from a stimulus or input. This is the ability that enables the 'respondent' to answer questions. Questions based on comprehension or understanding use verbs like, interpret, classify, paraphrase, explain, and exemplify.

### *Prompt*

Would you be able to tell me the difference between remedial English classes and standard English classes?

### *ChatGPT's answer*

Absolutely, the distinction between remedial English classes and standard English classes is quite significant, especially in the context of teaching English as a second language.

### **Objective and Focus:**

**Remedial English Classes:** These are specifically designed to support students who are struggling with English. The focus is on addressing gaps in knowledge and skills, and bringing students up to a level where they can effectively engage with standard English curriculum.

**Standard English Classes:** These classes follow a general curriculum designed for the average learner, with the assumption that students have a certain level of proficiency in English. The focus is on progressing through a structured program that covers all language skills - reading, writing, speaking, and listening.

### **Curriculum and Pace:**

**Remedial English Classes:** The curriculum is often more flexible, tailored to the specific needs of the students. The pace can be slower, with more repetition and reinforcement of concepts.

**Standard English Classes:** The curriculum is more standardized and follows a set pace, which might not accommodate individual learning differences as much as remedial classes do.

### **Teaching Methods:**

**Remedial English Classes:** These classes often employ a variety of teaching methods, including more one-on-one attention, use of multisensory approaches, and differentiated instruction to cater to diverse learning styles and needs.

**Standard English Classes:** While good standard classes also use a variety of teaching methods, they are generally more uniform and less individualized compared to remedial classes.

### **Class Size and Structure:**

**Remedial English Classes:** They tend to have smaller class sizes to allow for more individualized attention. The structure is often more flexible to adapt to the needs of the students.

**Standard English Classes:** These classes usually have larger class sizes and a more traditional classroom structure.

**Assessment and Evaluation:**

**Remedial English Classes:** Assessment is ongoing and diagnostic in nature, focusing on identifying areas of difficulty and measuring progress in specific skill areas.

**Standard English Classes:** Assessment is typically more standardized and may include regular tests and exams that follow the curriculum.

**Student Dynamics:**

**Remedial English Classes:** Students in these classes might share common challenges in learning English, which can create a supportive environment where students feel understood and less isolated in their struggles.

**Standard English Classes:** These classes consist of a more heterogeneous group in terms of language proficiency, and the environment is geared towards a general audience.

As an educator in this field, it's important to recognize that both types of classes play crucial roles. Remedial classes are essential for providing targeted support and ensuring that all students have the opportunity to succeed in their language learning journey. Standard classes, on the other hand, offer a broad-based education that advances students through a structured linguistic and academic program. The key is to ensure that the transition between remedial and standard classes is smooth and that students receive the support they need at every stage of their learning process.

***Commentary by the Researcher***

Deducing that ChatGPT understands is arguable. Critics (such as Denning (2023) above) say that AI does not understand what information it receives; it is a predicting machine that merely produces information without comprehension based on the prompts it receives. The exchange above can indeed be regarded as the automatic regurgitation of information in response to the words in the prompt. In the final paragraph, however, ChatGPT offers an opinion on the issue; it makes a statement on what is important for the educator in this context. This is harder to do without understanding the matter discussed, although it is still possible.

**4.3. Applying/Synthesising**

Applying or synthesising requires the AI to process the information it has to create an answer or solution. This is where the AI needs to make 'how to' statements in response to the questions given in the prompts. To create questions in this category of thinking, verbs like implement, carry out, see, and execute are needed.

***Prompt***

Are you able to provide a justification for establishing a remedial English language class in an urban primary school in Kuala Lumpur?

***ChatGPT's answer***

Establishing a remedial English language class in an urban primary school in Kuala Lumpur can be justified on several grounds, particularly considering the linguistic, educational, and social contexts of Malaysia:

**Linguistic Diversity:** Malaysia is a linguistically diverse country, with Bahasa Malaysia as the national language and various other languages spoken across different communities. In such a setting, English, often as a second or third language, might not be uniformly mastered by all students. Remedial classes can help bridge this gap, ensuring that students from diverse linguistic backgrounds have equal opportunities to excel in English.

**Academic Success:** Proficiency in English is crucial for academic success, as English is often the medium of instruction in many subjects and is a key component of national exams. Students struggling



with English are at a disadvantage in almost all areas of their academic life. Remedial classes provide these students with the support they need to succeed academically.

**Global Competence:** English is a global lingua franca. Proficiency in English is not just about academic success; it's also about equipping students with the language skills they need to participate effectively in a globalized world. This is particularly relevant in an urban setting like Kuala Lumpur, which is a melting pot of cultures and a hub for international business and tourism.

**Socio-Economic Considerations:** Urban areas often have wide socio-economic diversity. Students from lower socio-economic backgrounds may not have access to the same level of English language exposure as their more affluent peers. Remedial classes can help level the playing field, providing all students with the opportunity to develop their English language skills.

**Cultural Integration and Inclusivity:** Kuala Lumpur's urban schools likely have a mix of students from different cultural and ethnic backgrounds. English serves as a common language that can aid in cultural integration and inclusivity. Remedial English classes can ensure that all students, regardless of their first language or cultural background, can communicate and engage with each other effectively.

**Educational Policy and National Goals:** Malaysia's educational policies often emphasize the importance of English proficiency for national development. Remedial English classes align with these policies by ensuring that the future workforce is proficient in English, which is vital for Malaysia's economic and international aspirations.

**Parental and Community Expectations:** In urban areas like Kuala Lumpur, parents and communities often have high expectations for education and recognize the importance of English proficiency. Remedial classes can meet these expectations and demonstrate the school's commitment to providing a comprehensive education.

**Technological Advancements and Future Opportunities:**

As technology becomes increasingly integral to education and the workplace, proficiency in English is essential for accessing technological resources, participating in online learning platforms, and preparing for future careers in a digital world.

In summary, establishing a remedial English language class in an urban primary school in Kuala Lumpur is not only about addressing the immediate language needs of students but also about contributing to their long-term academic success, cultural integration, and future opportunities in a globalized world. It's a proactive step towards ensuring that all students, regardless of their background, have the skills they need to thrive in a diverse and interconnected world.

***Commentary by the Researcher***

Here, ChatGPT performs a complex string of tasks: it retrieves information on the issue and its context, lists the relevant factors pertaining to the issue, and, in the final paragraph, tailors the proposed options or tasks to suit the context of the issue. The latter information is not given in the prompt, rather ChatGPT retrieves it independently. Here, we can again raise the question of whether or not ChatGPT 'understands' the meanings associated with the conversation. One could argue that if ChatGPT does not understand the concepts/meaning of the information that it has, how then can it make such a recommendation? However, the alternative could also be argued: if it is merely a predictive machine, it could easily have chosen a random answer from the information available. Here, there is arguably an artificially intelligent consciousness different from that of a human's, mirroring the argument found in Arthur Koestler's publication *The Ghost in the Machine*. The teacher, however, will still find it difficult to differentiate between the two types of product, particularly if their students are capable of producing complex texts.

#### 4.4. Analysing

Analysing requires the interlocutor to examine his/her contribution and information presented to him/her to find patterns in the conversation and present them as a coherent pattern. The verbs involved in this act include compare, organise, deconstruct, outline, and integrate.

##### *Prompt*

How would a remedial English class in an urban setting compare to a remedial class in a rural setting?

##### *ChatGPT's answer*

Comparing remedial English classes in urban and rural settings involves considering various factors such as resources, student backgrounds, teaching methodologies, and the overall educational environment. Here's a comparative analysis:

##### **Urban Setting**

**Resources and Infrastructure:** Urban schools often have better access to resources such as modern teaching aids, technology, and materials for English language learning.

**Student Backgrounds:** Students in urban areas might have more exposure to English outside of school, through media, technology, and diverse linguistic environments.

**Teacher Qualifications:** Urban schools may have access to more qualified or experienced English teachers due to a larger pool of educators and better funding.

**Class Diversity:** Urban classes are likely to be more culturally and linguistically diverse, with students from various backgrounds.

**Technology Integration:** There's often greater integration of technology in teaching, with the use of digital tools, online resources, and multimedia.

**Parental Involvement:** Parents in urban areas might have higher expectations for English proficiency and can be more involved due to better awareness or education.

**Extracurricular Opportunities:** Urban schools may offer more extracurricular activities related to English, like language clubs, competitions, and interaction with native speakers.

##### **Rural Setting**

**Limited Resources:** Rural schools often face challenges in terms of resources, with less access to modern teaching aids and materials.

**Different Student Exposure:** Students might have limited exposure to English outside of school, with less interaction with the language in their daily lives.

**Teacher Availability:** There might be a shortage of qualified English teachers, and educators may have to handle multiple subjects.

**Homogeneity in Class:** Classes might be more homogenous in terms of cultural and linguistic backgrounds, with students sharing similar local or regional characteristics.

**Limited Technology Use:** Due to limited resources, there might be less integration of technology in language teaching.

**Parental Involvement:** Parents in rural areas might be less involved in their children's English education due to various factors, such as lower levels of education, awareness, or availability.

**Fewer Extracurricular Activities:** There may be fewer opportunities for language enrichment outside the classroom, such as clubs or interactions with native speakers.

##### **Commonalities and Adaptations**

Despite these differences, both urban and rural remedial English classes share the common goal of improving students' proficiency in English. However, the approach and methodology might differ. In urban settings, the approach can be more technology-driven and diverse in terms of cultural content. In contrast, in rural settings, teaching might rely more on traditional methods and focus on basic language skills, with adaptations to local contexts and resources.

In both cases, it's crucial to understand the specific needs and backgrounds of the students and to tailor the teaching methods accordingly. In rural areas, this might involve more community involvement and

the use of local contexts in teaching, while in urban areas, it could mean leveraging technology and diverse cultural materials to enhance learning.

### ***Commentary by the Researcher***

At the analytical level, ChatGPT demonstrates an ability to extract lists of properties of the two matters being compared. Then, in the discussion paragraphs, it presents a compare-and-contrast section with suggestions at the end. These are actions that a student would take in the same situation. Herein lies that problem for the teacher who is evaluating the text. With the exception of competent recalling of relevant information, which can also be done by a capable student, ChatGPT has not demonstrated anything that is identifiable as a 'peculiarly' AI trait. Thus, the teacher who is trying to tell the difference between the work of a human student and that of an AI will still likely be confounded.

### **4.5. Judging/Evaluating**

This section examines whether ChatGPT is able to differentiate between options presented to it in a conversation. This includes such actions as checking the input, critiquing its value, judging its value or relevance, testing its value, and arranging it in a hierarchy discussed in the conversation. The verbs used in this level include design, construct, plan, device, and make.

#### ***Prompt***

Could you select an appropriate textbook that was published in the last five years for the remedial English course in Kuala Lumpur?

#### ***ChatGPT's answers***

Selecting a textbook for a remedial English course in Kuala Lumpur, especially for young learners, requires careful consideration of the local context, the student's language proficiency levels, and the specific goals of the remedial program. While I can't browse current textbooks, I can suggest criteria for selecting an appropriate textbook and provide an example of the type of textbook that might be suitable.

#### **Criteria for Textbook Selection:**

**Cultural Relevance:** The textbook should include cultural references that are relatable to students in Kuala Lumpur, fostering a connection between their everyday experiences and the learning material.

**Language Level:** It should cater to the proficiency level of students in remedial classes, with a focus on basic vocabulary, grammar, and sentence structure.

**Engaging Content:** The textbook should contain engaging and age-appropriate content to maintain the interest of young learners.

**Incorporation of Skills:** A good textbook will incorporate activities and exercises for each of the four key language skills—reading, writing, speaking, and listening.

**Visual Aids:** Since the textbook is for young learners, it should include plenty of visual aids, such as pictures and diagrams, to facilitate learning.

**Interactive Elements:** Look for books that include interactive elements like games, puzzles, and group activities to encourage active participation.

**Supplementary Materials:** The availability of supplementary materials like workbooks, audio-visual aids, and online resources would be beneficial.

**Teacher's Guide:** A comprehensive teacher's guide is essential for helping instructors effectively use the textbook in a remedial setting.

#### **Example Textbook:**

"English Explorer" (New Edition) by National Geographic Learning

**Published Date:** Within the last five years.

**Content:** This series is known for its engaging content that combines language learning with fascinating information from National Geographic. It includes cultural references, stories, and visuals that can captivate young learners.

**Skills Development:** The series covers all four language skills with a variety of exercises and activities. Supplementary Materials: It often comes with supplementary materials and a teacher's guide, which can be very helpful in a remedial setting.

**Visual and Interactive Elements:** The use of National Geographic photos and videos makes it visually appealing and interactive.

**Note:**

It's important to review the most recent edition of any textbook series to ensure it aligns with your specific educational goals and your students' needs. Additionally, consulting with local educational resources or colleagues who have experience teaching remedial English in Kuala Lumpur can provide valuable insights into the most effective and culturally appropriate materials.

**Commentary by the Researcher**

Here, ChatGPT makes a judgment on which textbooks are most relevant for the course discussed. It also follows the same pattern of discussion as in the previous threads: it presents premises or factors to be considered when making this judgment, it then makes the judgment. This provides us with a clue that can help us categorically identify ChatGPT's work as an AI: it will provide the categories and then deliver the required product based on the information from the parameters. This pattern can also be performed by the individual human, but its consistency may allude to one factor that can help us differentiate between the AI and human products: texts.

**4.6. Creating**

ChatGPT can create images through its image generator Dall-E. Creating presents the final challenge to this differentiating task. AI, or any earlier 'thinking machines', are often understood to only be able to work on the basis of information that it has been fed. They cannot produce anything new. Media and literature, however, present the idea that machines can also be creative. For example, Andrew in the movie *Bicentennial Man* created clocks and later replacement body parts. In this section, this paper will begin by prompting ChatGPT to produce a piece of creative work: a poem.

**Prompt**

Could you compose a short poem that would be appropriate for a literature section in the remedial English course in Kuala Lumpur?

**ChatGPT's answer.**

Certainly! When composing a poem for a remedial English course in Kuala Lumpur, especially for young learners, it's important to use simple language, relatable themes, and a rhythmic structure that can engage the students and aid in language learning. Here's a short poem that could be suitable:

**The Colours of Kuala Lumpur**

In Kuala Lumpur, where dreams take flight,  
Under the sun, so warm and bright.  
Skyscrapers touch the sky so blue,  
In a city of colours, vibrant and true.

Green are the parks where we love to play,  
Laughing and running in the light of day.  
Yellow and red, the flowers bloom,  
Filling the air with their sweet perfume.

The night market buzzes, lively and loud,  
A rainbow of people, a wonderful crowd.  
Lights twinkle like stars, a magical view,  
In shades of orange, purple, and blue.

In our city of colours, we live and learn,  
With each new day, a new page we turn.  
Together we grow, in a place so dear,  
Kuala Lumpur, our home, right here.

This poem incorporates elements of the local setting (Kuala Lumpur), uses simple language, and presents vivid imagery that young learners can relate to and visualize. The rhyme scheme makes it easier for students to follow and remember, which can be particularly helpful in a remedial English setting. Additionally, the poem can serve as a starting point for various language activities, such as vocabulary exercises, comprehension questions, or discussions about the students' own experiences in the city.

#### ***Commentary by the Researcher***

The poem employs poetic techniques competently, but the subject matter lacks depth of emotion. However, if the teacher is trying to differentiate between the works of younger pupils and AI, this fact will not benefit the task.

#### **4.7. Clarification Questions**

##### ***Prompt***

Did you write the poem above or was it composed by a poet?

##### ***ChatGPT's answer***

I composed the poem above specifically for your request. It was not written by a known poet but was created to fit the context of a remedial English course in Kuala Lumpur, keeping in mind the need for simple language, relatable themes, and a structure that would be engaging and accessible for young learners. As an AI developed by OpenAI, I can generate original content like poems, stories, or essays based on specific requirements or themes provided by users.

##### ***Commentary by the Researcher***

In this clarifying answer, ChatGPT demonstrates self-reflexivity, i.e., the ability to talk about itself. However, this may not be a sign of self-awareness because it may simply be regurgitating information that has been fed into its database and programming.

The capabilities demonstrated by ChatGPT in completing tasks at different levels in the hierarchy of the cognitive domain show that its use can benefit teachers in the many tasks required of them in the course of their profession. When asked the following question, ChatGPT provides its answer (see below).

## **5. Findings and Discussion**

These interactions with ChatGPT illustrate how ChatGPT is capable of fulfilling demands and answering questions based on Bloom's Taxonomy, which categories the abilities of the human mind.

- ChatGPT can accurately retrieve all information,
- ChatGPT can either effectively comprehend or emulate comprehension of the questions and demands,
- ChatGPT can perform analysis of items presented,
- ChatGPT can synthesise from available information to generate appropriate responses,
- ChatGPT can evaluate between options presented to it or those found in its inquiry, and
- ChatGPT, most importantly, can generate creative work.

These factors compound the challenges teachers face in distinguishing work generated by ChatGPT from that of human students. Moreover, with plugins like Dall-E and Invideo, ChatGPT is also able to generate images and videos, respectively, according to prompts provided by the user. Additionally, the

texts produced by ChatGPT do not appear in searches because they are not plagiarized. Rather, they are produced by the AI system based on the information it processes, which makes the texts it produces original.

## 6. Conclusion

ChatGPT and other AI machines have the potential to be beneficial tools for teachers to work better and more efficiently. In light of the ever-increasing workload faced by teachers, ChatGPT and potentially other AI machines can change the way teachers produce and work with teaching and learning materials. Furthermore, with the increasing prominence of online teaching and learning, ChatGPT and other AI tools present teachers with the opportunity to become more effective and efficient. However, ChatGPT and other AI machines also present many challenges. This paper examines one specific challenge: that of telling the difference between the work of a human student and the work of ChatGPT. To guide this examination, this study uses the cognitive domain of Bloom's Taxonomy to engage ChatGPT at different levels of orders of thinking. ChatGPT shows that it can competently answer questions at different levels of order of thinking. It can be argued that while its answers are accurate, they may lack the maturity and depth that an adult mind is capable of, but the comparison these hypothetical teachers are trying to make is between the work of ChatGPT and that of their younger students. Alternatively, it can also be argued that the language used by ChatGPT exceeds the mastery level of younger students in English as a second or foreign language (ESL). It still means, however, that there is a great probability that teachers will find it hard to recognise if a piece of assignment handed in by their student has been produced by ChatGPT.

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