

Gemini Program and Arabic Language Teaching: An Analytical Study

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ABSTRACT

This study aims to provide a description of the Gemini digital program in teaching the Arabic language to both native and non-native speakers, analyzing the cognitive, linguistic, grammatical, and educational information offered by the program according to artificial intelligence principles for the benefit of the Arabic language, particularly in the areas of text creation and translation. We conducted a study of the Gemini program using both descriptive and quantitative methods, based on the hypothesis that the developers of this program relied on a specialized team in Arabic linguistics, who are knowledgeable about its nuances and characteristics that align with digital systems, as well as experts in artificial intelligence principles. Thus, we question to what extent this "Gemini" intelligent program can effectively teach the Arabic language. The study concluded with several findings, including that language teaching programs using artificial intelligence need to be supplied with comprehensive and high-quality databases by specialists in the field of linguistics. Since the Arabic language has a special character that distinguishes it from foreign languages, the developers of the Gemini program aimed to meet all needs of both native and non-native speakers through relatively simple databases. These databases do not fully represent the system described by Arabic linguistic theory. The results of this study have shown that the data provided by artificial intelligence programs fall short of meeting the needs of Arabic language learners, especially in the program under investigation. Moreover, this data may sometimes be misleading and provide incorrect information. Therefore, this program needs to be developed .

Keywords: Artificial Intelligence; Gemini, Generative AI; Productivity; Arabic Language.

INTRODUCTION

Use The scientific revolution brought about by artificial intelligence today has transformed our daily lives, leading us towards a digital future that harnesses all smart technical tools to enhance human cognition. Keeping up with the rapid developments of our time has become a necessity. This evolution has given rise to a digital human who embraces digital principles, leading to significant changes in many concepts and assumptions that we once held, such as those related to human beings, writing, language, identity, and others that have been influenced by the results of AI use in line with the advancements of the era. Terms like the digital human, digital text, digital writing, and digital identity are now prominent in scientific discourse, and these are concepts that have firmly established themselves in the academic field.

With the shift in the pattern of life, there has also been a transformation in the education and reading systems, as well as in the concept of the learner and the reader. The academic and literary fields have been enriched with new terms that keep pace with technological advancements and artificial intelligence. New educational programs have been developed that largely fulfill the predictions made by digital age scholars about the end of paper books and the birth of digital books, the end of physical libraries and the emergence of digital libraries, the end of traditional teachers and the rise of digital/electronic teachers, and the transformation of the ordinary reader into a digital reader. One of the most notable programs in this educational process is the Gemini program—the subject of this study. It is a recent product of artificial intelligence in general, and generative AI in particular.

Generative AI applications and programs contribute significantly to enhancing the educational process, as this technology allows the generation and production of valuable educational content across various fields. Thanks to its diverse programs, AI can create texts and research that match the learner's needs and cognitive capabilities. Through its vast potential, the Gemini program has managed to establish a database of questions and answers to enhance the knowledge and skills that the learner acquires during the digital educational process.

RESEARCH PROBLEM

We question the future of the Gemini program as it evolves. How has it managed to leverage generative AI principles in its educational process? Has Gemini succeeded in providing the correct information to the learner? To what extent has Gemini presented information in innovative ways? And can learners find in the Gemini program an adequate substitute for the traditional teacher? Does Gemini contribute to obtaining 100% accurate and correct information? What is the future of learning the Arabic language within the framework of Gemini?

To address this broad topic, our study will focus solely on the teaching of the Arabic language, without delving into other scientific or knowledge domains, as the scope of this paper does not allow for such an extensive exploration, despite the richness and appeal of the program.

IMPORTANCE OF THE STUDY

This study is of particular importance as it is, to the best of our knowledge, the first of its kind in Algeria to analyze the Gemini program, especially regarding its application in teaching the Arabic language to both native and non-native speakers using generative AI principles.

Hence, this research will contribute to helping specialists take the necessary steps to handle the information given in this topic, especially its grammatical and semantic sides. We will be referring to previously conducted research on other programs since Gemini itself is not an old invention and has not received wide attention in academic research so far, let alone when it comes to Arabic language teaching. Therefore, this paper is going to consider that those who developed the Gemini program are qualified with a deep and accurate understanding of generative AI principles and also aware of Arabic linguistics, taking for granted their acquaintance with the grammatical and rhetorical peculiarities and delicacies of the Arabic language. Therefore, we embark on our research with a central question, namely: how can the abstract express the concrete? How can the artificial intelligence algorithm formulate and digitize the rules of Arabic grammar?

PREVIOUS STUDIES

Hence, this research will contribute to helping specialists take the necessary steps towards handling the information given in this topic, especially its grammatical and semantic sides. We are going to refer to previously conducted research about other programs, since Gemini itself is not an old invention and has not received wide attention in academic research so far, let alone when it comes to Arabic language teaching. Therefore, this paper is going to consider that those who developed the Gemini program are qualified with a deep and accurate understanding of generative AI principles and also aware of Arabic linguistics, taking for granted their acquaintance with the grammatical and rhetorical peculiarities and delicacies of the Arabic language. Thus, we embark on our research with a central question, namely: how can the abstract express the concrete? It accelerates advanced scientific discoveries, analysis processes, and the extraction of results (Al-Bayati Edition, 2024, p. 20). Generative Artificial Intelligence (GAI) refers to the production of new content based on specific data using trained algorithms for the researcher, teacher, or student. It is a field of creativity and innovation, each in their respective specialization (Kashmiri, 2024, p. 518) . GAI is a branch of artificial intelligence focused on generating new digital content, primarily relying on the integration of textual, auditory, visual, gustatory, and tactile elements. This means it includes texts, images, sounds, and videos that contribute to delivering and achieving the desired information and interaction between the sender and the receiver.

Gemini Program: The Gemini program was launched by Google in December 2023, designed to provide its users with various functionalities. It can generate texts, translate them, and create similar texts. One of its notable features is its ability to interact with users, answering a wide variety of questions. Like other smart programs (Wikipedia, 2025) , Gemini contributes to enhancing and developing teaching methods. It enables students and learners to create personalized educational content according to their needs and interests.(Fakhreddine:, 2024, p. 4)

Digital Educational Process: Previously, the classical educational process (didactic) was focused on the transmission of knowledge and information. However, education today revolves around "learning the skills needed to

acquire knowledge and information," which is known as active learning. This includes the ability to use artificial intelligence technologies, a crucial skill for the modern job market.)(Al-Jund, 2023, p. 313). Therefore, it has become necessary for teachers and instructors to embrace this scientific development and teach it to their students in order to foster minds that surpass machine systems and outperform artificial intelligence itself.

Arabic language and generative artificial intelligence: the use of artificial intelligence to support and teach the Arabic language is an interesting and thought-provoking topic, raising questions about how to achieve harmony between linguistic authenticity and scientific advancement (Anon., 2025). In fact, the Gemini application is not limited to the Arabic language alone; it is a comprehensive knowledge program that is still under development, continuously evolving by utilizing various generative AI techniques and applications. However, we have chosen to focus on the Arabic language due to our specialization, and because of the unique qualities of Arabic, which make it responsive to many applications aimed at improving the level of education and learning.

It is not an exaggeration to say that Arabic possesses characteristics and features that many other languages lack in their structure, making it capable of exploiting generative AI techniques. One of its most notable features is its generative, productive system, which is equipped to generate multiple patterns, thereby demonstrating its responsiveness to generative AI systems, especially in the creation of texts, images, and videos with educational content.

ANALYTICAL STUDY OF THE GEMINI PROGRAM AND TESTING ITS EDUCATIONAL CAPABILITIES IN THE FIELD OF ARABIC LANGUAGE

In our analytical study of this intelligent program, we will focus on the relationship between Gemini and the Arabic language learner. It is assumed that Gemini is equipped with a database that can meet the learner's knowledge needs in the field of Arabic. These smart programs are capable of understanding natural language, which can be distinguished through several criteria, including: the ability to provide the appropriate answer to a question posed, the ability to explain phrases in different ways by rephrasing them, the ability to translate into other languages, and the ability to recognize objects and names. (Bonier, 1993, p. 31)

The reaction of the Gemini program reveals that it is endowed with a rich and diverse

This was evident when we asked the program to introduce itself, and it responded as follows: (<https://gemini.google.com/app/74c3eabbc8ed5243?hl=ar>), s.d.)

- "I am Gemini, a large language model developed by Google AI. I am a machine learning model, which means I'm a computer program designed to generate text, translate languages, create various forms of creative content, and answer your questions in an informative manner. I'm still learning, but I've learned how to execute many tasks, such as:
- I will make sure that I do my best in following your instructions and requests.
- I will use my knowledge to answer your questions comprehensively and informatively, despite their open-ended, complex, or unusual nature.
- I will generate different formats for creative writing like Poems, Codes, Text, Music Pieces, Email, Messages, etc. I will do my best to fulfill all your requirements.
- I am still learning, and I am excited to see what I can do in the future. What questions do you have for me today? Would you like to try me with a different type of task? Let me know how I can assist you today."

The response from the Gemini program indicates that it is equipped with a rich and diverse database, and it portrays itself as an instructor who strives to meet the learners' needs across various fields of knowledge. It is capable of performing many tasks, as stated above. The generative capabilities of Gemini can be summarized in the following diagram:

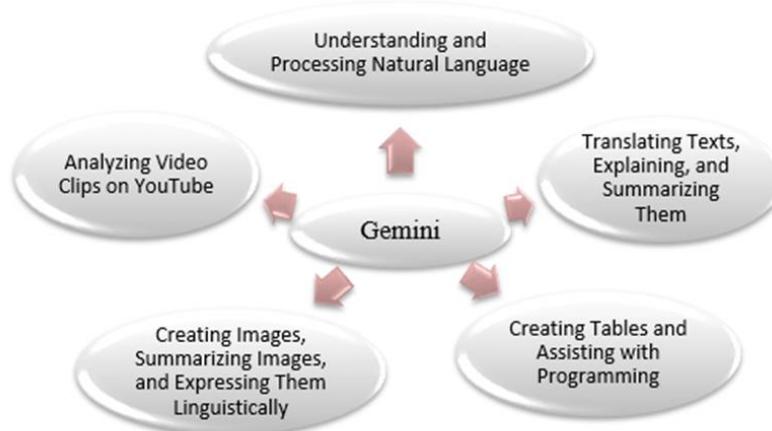


FIGURE 1. Diagram of Gemini Capabilities

GEMINI CAPABILITIES TESTING BY THE COMPANY: (AI Capabilities of Gemini from Google, 2025)

Recognizing the Duck: The program had to recognize a drawing of something with certain random lines drawn on a piece of paper, which basically resembled a duck. The program was able to recognize the drawing of the duck with the help of the random lines. Then, the presenter had brought a rubber duck toy to actually show to the audience and to ask Gemini whether it sank or floated in the water. Gemini was able to make a correct piece of information out of the vague idea with the help of its programming capabilities.

Recognizing the Scene: During the presentation, in one of the video clips shown by the presenter, an amateur actor was mimicking some actions. The presenter asked Gemini if it could identify the movie from which this clip came. Gemini correctly identified it as the famous scene of dodging bullets in the movie The Matrix. This demonstrates Gemini's cognitive abilities to retrieve the required information effectively and accurately.

Testing the Gemini Program: We will highlight the generative aspect of this smart program by testing some of its capabilities in understanding language and processing aspects of the Arabic language, particularly related to grammatical rules. We aim to evaluate to what extent Gemini can teach grammar rules:

TESTING UNDERSTANDING AND ANALYZING LANGUAGE:

These programs operate based on a natural language system, using everyday language to ask questions and provide answers by transforming key words in natural language into inquiries. They generally work through a dialogue between the user and the system, where the user asks a question (Abdel Hadi Zain, 2000, p. 32), and the system searches for relevant keywords in the query. We observed this in Gemini when we tested its natural language processing abilities as follows:

- We asked Gemini: What is your concept of language? Its response was as follows: (<https://gemini.google.com/app/74c3eabbc8ed5243?hl=ar>, s.d.)
- Language: A complex and rich human phenomenon, it forms a vital fabric that connects individuals and communities. It is a tool for communication and expression, a repository of knowledge and culture, and a window into both internal and external worlds.

MULTIPLE DEFINITIONS

A System of Symbols: Language is defined as a system of symbols, which could be spoken (words), written (letters), or gestural (signals), agreed upon by a group of people to express their thoughts, feelings, and experiences.

- **A Tool for Knowledge:** Language is a fundamental tool for acquiring and transmitting knowledge across generations. It is a means for understanding the world around us, organizing our thoughts, and discovering new truths.
- **A Means of Communication:** Communication is at the core of language. It enables us to interact with others,

exchange information, build relationships, and participate in social life.

- Cultural Identity: Language is an integral part of our cultural identity. It reflects our values, customs, and traditions, and contributes to preserving our heritage and history.
- Thinking and Creativity: Language is closely related to thinking. We often formulate our thoughts internally using language, and we also use it for creativity and self-expression through arts and literature.

LANGUAGE CHARACTERISTICS

- Symbolism: Words and signs in a language refer to specific meanings that are agreed upon by its users.
- Grammar: Language follows a set of grammatical and morphological rules that govern how words and sentences are constructed.
- Dynamism: Language is a living entity that constantly evolves. Over time, the meanings of words change, new words emerge, and grammatical rules are altered.
- Diversity: Languages vary across the world, differing in sounds, grammar, and meanings.

It appears that the program presenter provided Gemini with a comprehensive database about the concept of language, its definition, and its characteristics. The answers focused on the essential elements of the definition of language, including that it is made up of signs and symbols, and serves as a tool for communication, knowledge, and cultural exchange. Additionally, it is based on grammatical and morphological rules, and its characteristics include diversity, symbolism, and change.

Gemini followed up its definition of language with a note stating that what it provided was a summary of the concept of language. It added that language can be better understood by exploring linguistic sciences such as linguistics, phonology, semantics, and sociology. This response shows the creative aspect of this smart program, which was able to generate multiple answers from a single question.

- We asked Gemini for the meaning of the word "Islam." We noticed that the response was given in English, and it provided three drafts, each offering an analysis that was almost identical to the second and third drafts. Each analysis was generated by pressing its corresponding number. Below is a representation of Gemini's answer:

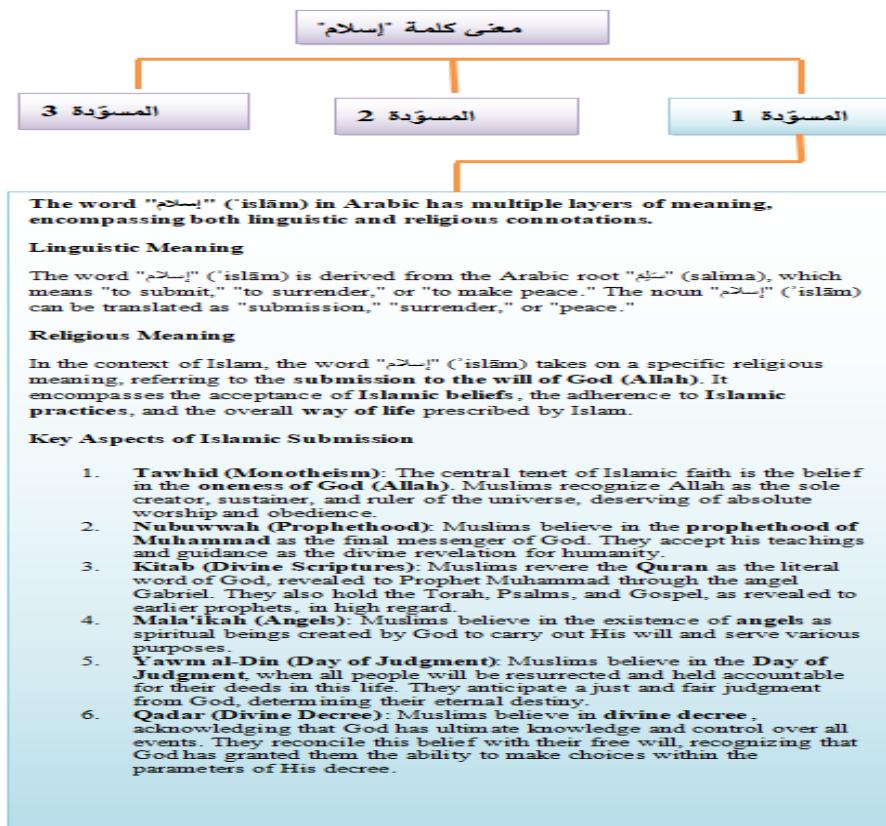


FIGURE 1. The Concept of Islam in Gemini.

Later, we asked Gemini to provide the answer to the meaning of the word "Islam" in Arabic, and its response was as follows:

"Certainly, I will answer your questions in Arabic. Please ask your questions, and I will do my best to provide comprehensive and informative answers."

It is noticeable that Gemini conducted a thorough theoretical analysis of the word Islam, offering a comprehensive theoretical answer that provided enough information to understand and grasp its various dimensions.

- In analyzing sentences, we asked Gemini the following request: Explain the following sentence: "Takallamarassaasa al-aduww" (تَكَلَّمُ رَصَاصُ الْعَدُو). Gemini's response revealed some errors that should not have occurred, as it is an educational program designed to assist both native and non-native Arabic speakers in learning its rules. The response was as follows: (<https://gemini.google.com/app/74c3eabbc8ed5243?hl=ar>, s.d.)

The sentence "Takallamarassaasa al-aduww" is a strong figurative expression used to describe the sound of gunfire from the enemy.

- Sentence Analysis:
- Subject: "رَصَاصُ الْعَدُو" (The enemy's bullets).
- Predicate: "تَكَلَّمُ" (spoke).
- Sentence type: Verbal sentence.
- Tense: Present tense.
- Literal meaning: The sentence indicates that the enemy's bullets produce sounds resembling speech.
- Figurative meaning: Bullets do not literally speak.
- The use of the verb "تَكَلَّمُ" (speak) here is a figurative expression.
- It refers to the sound of gunfire.
- It attributes a human-like quality to the bullets.
- It conveys the intensity and danger of the situation.
- It evokes feelings of fear and dread.

Gemini's analysis of this sentence can be divided into three linguistic areas: semantic, syntactic, and rhetorical. This suggests that Gemini understands the relationships between the linguistic units of the Arabic sentence. Gemini noticed that the sentence was figurative and attempted to analyze it, distinguishing between its literal and figurative meanings. However, it made several errors in parsing the sentence. It mistakenly classified "رَصَاصُ الْعَدُو" (the enemy's bullets) as the subject, when it is actually the object. It also incorrectly identified the verb "تَكَلَّمُ" as the predicate in present tense (it should be past tense), and failed to accurately assign grammatical functions to the words in the sentence. This demonstrates that Gemini's syntactical and rhetorical processing is still incomplete.

After pointing out the error, we asked Gemini to correct its analysis:
There is an error in your analysis of the sentence "تَكَلَّمُ رَصَاصُ الْعَدُو".

Gemini's response was:

I apologize for the mistake in my previous analysis of the sentence "تَكَلَّمُ رَصَاصُ الْعَدُو".

- Correct sentence analysis:
- Verb: تَكَلَّمُ (spoke).
- Subject: Implied, estimated as "هُوَ" (he).
- Object: رَصَاصُ الْعَدُو (the enemy's bullets).
- Sentence type: Verbal, present tense.
- Explanation of the analysis:
- The verb "تَكَلَّمُ" (spoke):
- Present tense verb, built on a فَتح (fatha) ending.
- It is a defective verb with no specific grammatical position (it requires a subject).
- The subject:
- Implied pronoun "هُوَ" (he).
- Refers back to "رَصَاصُ الْعَدُو" (the enemy's bullets).

- The object:
- Nominal sentence formed by:
- Definite noun: "رصاص" (bullets).
- Adjective: "العدو" (the enemy).

"رصاص العدو" (the enemy's bullets) is in the nominative case because it functions as the object.

Gemini's correction is entirely flawed, as it misinterprets several aspects:

It mistakenly considered the verb "كلم" as present tense (which should be past tense), and incorrectly identified it as a defective verb when it is complete.

The subject was referred to as an implied pronoun, which does not fit the sentence structure, since the subject is clear and explicit.

It misidentified the object of the sentence as a nominal sentence, while the correct analysis is that "رصاص العدو" is the object of the verb.

This analysis reveals that Gemini lacks a sufficiently developed database in the fields of Arabic grammar and rhetoric, which are critical for a learner to properly understand and study the Arabic language. This highlights a concern raised by Muhammad Al-Hadi in his article The Future of Artificial Intelligence, where he notes that such programs are prone to errors and questions whether researchers can solve this issue (Al-Hadi, 2024).

However, in another test regarding grammar and sentence parsing, Gemini shows some contradictions. In theory, it seems to have knowledge of grammar rules and sentence analysis, with enough data to provide correct grammatical parsing. But in practice, as we saw, it faltered and made mistakes, leading to inconsistent performance. Below is an example of what Gemini responded when we asked it about the correct way to parse the elements of an Arabic sentence:

(<https://gemini.google.com/app/74c3eabbc8ed5243?hl=ar>, s.d.)

METHOD OF PARSING A SENTENCE IN ARABIC

- Parsing (اعراب) refers to the process of analyzing the words in an Arabic sentence to identify their type, grammatical case, and relationships with other words in the sentence.
- Steps for Parsing a Sentence:
- Understanding the Meaning of the Sentence: Read the sentence carefully and understand its general meaning.
- Identify the subject, verb, and object (if present).
- Determining the Type of Sentence:
- Nominal sentence: Starts with a noun followed by a predicate.
- Verbal sentence: Starts with a verb followed by the subject.
- Identifying the Words: Identify each word in the sentence.
- Determining the Type of Each Word:
 - Noun: Is it definite or indefinite? Masculine or feminine? Singular, dual, or plural?
 - Verb: Is it past, present, or imperative? Is it complete or incomplete?
 - Particle: What type of particle is it? Is it a preposition, conjunction, or accusative particle?
- Determining the Parsing of Each Word:
 - Noun: Is it nominative, accusative, or genitive? What is its parsing mark?
 - Verb: Is it raised, jussive, or accusative? What is its parsing mark?
 - Particle: Particles are not parsed but affect the word they precede by assigning it a case.
- Writing the Parsing:
- Write each word along with its type and parsing.

Example:

Sentence: "يقرأ الطالب الكتاب" (The student reads the book.)

- Analysis:
- يقرأ: Present tense verb, raised with a visible damma.

- الطالب: Subject, nominative with a visible damma.
- الكتاب: Object, accusative with a visible fatha.

Important Notes:

- Parsing marks: Damma (for nominative), Fatha (for accusative), Kasra (for genitive).
- The hidden pronoun: Sometimes, the subject is a hidden pronoun (e.g., "هُوَ" - "he").
- Defective verbs: Like كَانَ and its sisters, followed by an accusative noun.
- Prepositions: They come before the noun and assign it the genitive case.

Useful Tips:

- Continuous practice: The more you practice parsing sentences, the more skilled you will become.
- Refer to grammatical rules: If you encounter difficulty parsing a word, refer to the rules.
- Use grammar books: There are many books that explain parsing rules in detail.

Gemini's Response to Sentence Parsing: The text demonstrates Gemini's proficiency in theoretical aspects, as it presented all the necessary steps for parsing Arabic sentences. It offers valuable tips for learners, emphasizing its role as an educational tool. While it provides detailed information for learners, it also showcases its confidence in the information it possesses, encouraging learners to ask questions and reassuring them of its ability to provide answers.

However, this confidence places us in a situation where Gemini's linguistic competency fluctuates between accurate theoretical information and errors in practical application. This discrepancy may mislead learners, especially when it comes to acquiring correct Arabic grammar, rhetoric, and syntax, which could hinder their ability to generate correct sentences and meanings, both syntactically and rhetorically.

TESTING GEMINI'S ABILITY TO TRANSLATE NATURAL LANGUAGE

Gemini is capable of translating sentences and texts. We tested this ability by asking it to translate the following sentence:

- “تسعى الجامعة الجزائرية اليوم إلى تطوير قدراتها في مجال الذكاء الاصطناعي” (The Algerian university today seeks to develop its capabilities in the field of artificial intelligence).

Gemini provided three drafts for the translation. One version was:

- "Algerian universities are today striving to develop their capabilities in the field of artificial intelligence."

Here is a more detailed breakdown of the translation:

- تسعى (tas'a) = strives
- الجامعة (al-jāmi‘ah) = university
- الجزائرية (al-jazā‘iriyah) = Algerian
- اليوم (al-yawm) = today
- إلى (‘ilā) = to
- تطوير (taṭwīr) = develop
- قدراتها (qadrātihā) = its capabilities
- في مجال (fī mājal) = in the field of
- الذكاء الاصطناعي (al-ḍikā‘ al-ṣiinā‘ī) = artificial intelligence

Gemini then proceeded to provide a detailed breakdown of the translation, demonstrating its understanding of individual word meanings and context. However, one issue arose with the translation of "الجامعة الجزائرية" (the Algerian university), which was translated as "Algerian universities" (plural), even though the original sentence referred to the singular university. Additionally, the verb "is" should have been used instead of "are" in this case, indicating that Gemini's translation contained some errors.

TESTING GEMINI'S ABILITY TO DESCRIBE AND SUMMARIZE IMAGES

We asked Gemini to describe and summarize the content of an image. Initially, Gemini responded in English:



FIGURE 3. This is an example of a figure

- Foreground: The image's foreground features a tall, slender palm tree with a fan-shaped crown. The tree's smooth gray trunk is slightly tilted left.
- Midground: Soft, white sand stretches across the image, dotted with scattered clumps of seagrass and small rocks.
- Background: A vast turquoise blue ocean dominates the background, with gentle waves rolling toward the shore.
- Overall impression: The image evokes tranquility and serenity, symbolizing relaxation and peace.

Here are some additional linguistic expressions that could be used to describe the image:

- Idyllic: The image is a picture of an idyllic setting, a place that is perfect and peaceful.
- Pristine: The beach is pristine, meaning that it is clean and untouched.
- Untouched: The landscape is untouched, meaning that it has not been developed or altered by humans.

Next, we asked Gemini to express the description in Arabic, and its response was:

"الصورة تُظهر مشهدًا شامخًا يزدان بشجرة نخيل هادئًا على شاطئ خلابٍ مُنظَّمًا."

The Arabic description was:

"The image shows a breathtaking scene of a calm beach adorned with a towering palm tree. In the foreground, the tall palm tree stands proudly, showcasing its smooth gray trunk and its fan-shaped green crown. Surrounding the tree is soft, white sand stretching as far as the eye can see, interspersed with clumps of seaweed and small rocks. In the background, the turquoise blue of the ocean extends to the horizon, with gentle waves rolling toward the shore, some parts adorned with white foam."

The scene imparts a sense of tranquility and serenity, evoking feelings of relaxation and peace.

Overall, the image represents a stunning natural painting that expresses beauty, calmness, and serenity.

The palm tree is a symbol of tropical beauty, while the beach and ocean symbolize escape from the hustle of life and represent freedom."

The descriptive language used by the Gemini program to describe the image is reasonably acceptable in terms of style and meaning. The word choice and sentence structure are solid. Gemini produced short, grammatically correct, and semantically accurate sentences, blending both literal and figurative styles. This likely results from its extensive database related to image descriptions and summarization. It focuses on the psychological aspect, making the image "speak" despite its silence. This invites the learner into an interactive relationship that stimulates their expressive abilities and encourages imaginative thinking. By connecting symbols, such as color and what it signifies, and shadow and what it represents, Gemini fosters a relationship between the signifier and the signified.

In this way, Gemini has achieved the foundation of interactive/digital reading, which forms the core of interactive/electronic literature. It involves the reader directly in the educational process, making them the central element of the experience.

RESULTS

The Gemini program is an intelligent generative tool that seeks to communicate with the world through a diverse range of databases across various fields of knowledge.

Gemini is not fully capable of analyzing and processing language, especially Arabic, at the required level. This was evident in its analysis of the sentence "تكلم رصاص العدو" (The enemy's bullets spoke), where it demonstrated insufficient understanding of both syntactical and rhetorical aspects. On a theoretical level, it displayed complete contradictions. This leads us to conclude that the program cannot provide useful assistance to Arabic language learners unless it is further developed, particularly in the domain of understanding and processing the Arabic language.

Tests on translation, image description, and content summarization showed that Gemini has a fair capability in various knowledge areas, though not in natural language processing.

Generative artificial intelligence offers learners the opportunity to acquire information quickly and intelligently, making the learning process enjoyable on one hand, and effective on the other. This allows learners to create personalized experiences through dialogue and control.

The Arabic language in the Gemini program responds well to a variety of generative AI tools and techniques, such as question-answering, language learning, error correction, and the enhancement of the learning process through images, videos, and other educational media.

DISCUSSION OF RESULTS

Despite the vast potential that the Gemini program offers for the Arabic language, it makes mistakes in several key areas, particularly in its handling of core grammatical and morphological features. This allows us to answer the hypothesis raised earlier, which suggested that the developers of this program are familiar with AI applications but lack a deep understanding of the intricacies of the Arabic language. This results in the program failing to properly account for the complexities of Arabic grammar, which frequently breaks the rules, leading to errors in the information provided.

This brings attention to another issue that these so-called "smart" programs may face: misinformation or errors, particularly when the user is not an expert in the field. The data fed into these programs must be overseen by a team of experts and evaluators to ensure that the content they provide is accurate and beneficial for learners. Therefore, the developers of these programs should work to improve the quality of the services offered, ensuring that they are effective for both native speakers and learners of Arabic.

This also raises another issue regarding the "secularization" of the Arabic language and its sciences—specifically those that are not governed by algorithms, such as emotions (love, hate, pain, jealousy, etc.), internal feelings, and the flow of consciousness, which are core to literature. No algorithm can fully translate or interpret these feelings. This highlights the limitations of AI in the realm of human emotions and the deep, subjective aspects of language that are integral to understanding and experiencing literature.

CONCLUSION

This study remains limited in providing sufficient information about Gemini, as it is still a program under development. It continuously updates its knowledge whenever errors are pointed out in a stimulus-response relationship. This allows us to address the previously raised issue regarding the potential replacement of the traditional teacher with a virtual/digital teacher. To this extent, we can assert that the Arabic language is a complex algorithm and a multi-solution geometric expression, even if both sides of this equation are based on a combination of numbers and emotions.

A learner of the Arabic language cannot fully rely on the information provided by Gemini, particularly in its practical applications. Additionally, they cannot completely trust the digital principles and AI programs to adequately acquire the Arabic language unless the deficiencies are addressed, and such programs are supplied with a comprehensive database in Arabic language and its sciences.

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