



## Generative Artificial Intelligence and its Contribution to University Education in Mexico

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**Abstract:** *This document aims to encourage university professors to venture into the use of generative artificial intelligence by incorporating it as support in their daily teaching activities and tasks. Beginning with a brief history of artificial intelligence, tracing its evolution over time with simple descriptions, addressing the main types of artificial intelligence, with a focus on generative artificial intelligence. It mentions popular assistants and describes how to establish efficient dialogues. Concluding with tasks and activities that every university professor performs to deliver dynamic and engaging classes to students, along with recommendations for constructing dialogues with chat-based assistants to obtain appropriate responses.*

**Keywords:** *Professors, Artificial Intelligence, Generative Artificial Intelligence, Prompt.*

### 1. INTRODUCTION

The term Artificial Intelligence (AI) was first coined during the “Dartmouth Summer Research Project on Artificial Intelligence” conference led by John McCarthy in 1956. This conference marked the presentation of AI’s objectives and vision, making it the acknowledged birth moment of AI. However, the history of artificial intelligence traces back to 1943 with the publication of the article “A logical calculus of ideas immanent in nervous activity” by Warren McCulloch and Walter Pitts. In this work, the scientists introduced the first mathematical model for creating a neural network. Subsequently, in 1950, Alan Turing presented a test focusing on the machine’s imitation of human behavior, now recognized as the Turing Test (Moreno, 2019).

Nowadays, there isn’t an exact definition of Artificial Intelligence; however, in the brief history presented, it’s possible to observe that the study of this discipline began several years ago. Only now, with technological advances incorporating AI into everyday devices, do we begin to recognize its contributions in various fields such as entertainment, finance, commerce, production, and healthcare. In the educational sphere, the experiences during the Covid-19 pandemic highlight the benefits that the integration of information and communication technologies brings to processes and activities, simultaneously bringing about imminent innovation and a change from a traditional medium. Specifically, AI promises to be a significant support for teaching, not only in transforming teaching and learning processes but also in facilitating the everyday and demanding tasks of educators.

In this work, Generative Artificial Intelligence (GAI), a branch of artificial intelligence, is presented, mentioning the most popular assistants. It explores how university professors can use it in some daily tasks without jeopardizing ethical aspects, contributing indirectly to improving the quality of the teaching-learning process.

### 2. DEVELOPING

#### 2.1. Artificial Intelligence

According to Bourcier, as cited by Haces and Hernández (2011), artificial intelligence is a branch of computer science that seeks to reproduce human cognitive functions such as reasoning, memory, judgment, or decision-making. Subsequently, a portion of these faculties, considered signs of intelligence, is entrusted to computers.

Artificial intelligence is considered a fundamental discipline in science and technology, which over time has developed a set of basic knowledge enabling it to emulate various human capabilities to exhibit intelligent behaviors (Haces& Hernández, 2011).

**2.2. Types of Artificial Intelligence**

Computer science experts Stuart Russell and Peter Norvig distinguish four types of artificial intelligence (Table 1).

**Table1.** *Types of Artificial Intelligence*

Types of Artificial Intelligence	Description
Systems that Think Like Humans	These systems automate activities such as decision-making, problem-solving, and learning. An example is artificial neural networks.
Systems that Act Like Humans	These are computers that perform tasks similarly to how people do, as is the case with robots.
Rationally Acting Systems	These systems aim to emulate the rational logical thinking of humans, researching how to enable machines to perceive, reason, and act accordingly.
Systems that Think Rationally	These systems are the ones that try to imitate human behavior in a rational manner.

**Source:** *Original work, based on Norvig and Russell (2023).*

**2.3. Generative Artificial Intelligence**

Particular mention deserves Generative Artificial Intelligence (GAI), a branch that utilizes deep learning techniques applied in language generation models. Training involves large datasets or small volumes of data monitored by humans to enhance results (Castellanos, 2023).

As of 2022, there is a version capable of training these models with data extracted from various internet sources, giving rise to tools with the ability to generate responses and interactions previously not possible. This is suitable for projects requiring the creation of original and personalized content, such as creative content production (Universidad Nacional Autónoma de México, 2023).

Generative artificial intelligence models have become popular through chat-based assistants such as OpenAI's chat GPT, Google's Bard, and Microsoft's Bing. All of them have the ability to generate coherent and natural text on various topics, making them appealing to those seeking quick and acceptable answers, although not entirely accurate (Franganillo, Lopezosa, & Salse, 2023, p. 4). The content produced by these assistants should be handled with caution and always subjected to critical analysis (Antón, 2023).

Chat-based assistants are natural language processing technologies that use a deep neural network for machine learning to generate responses to questions and statements. They provide a natural way of communication through conversation, enabling people to ask questions or give instructions for the assistant to generate a response (Antón, 2023). These requests are called prompts and can be phrases, questions, or even complete paragraphs (ITMadrid Digital School, 2023). It's important to note that the prompt establishes the context and constraints for generating the response. Also, everything written will be recorded for developers to continue training the assistants, so it is not advisable to include personal information or create prompts that are considered dangerous or illegal.

Considering that even in these times of innovation and transformation, teaching continues its tradition of using large amounts of text, university professors can leverage GAI assistants not only to improve the quality of the teaching-learning process but also as support for planning, producing, and implementing educational resources, activities, and assessments. With this assistance, they can free up time to maintain human contact and dialogue during feedback moments and promote, reinforce, and practice characteristics unique to humans: spontaneity, critical thinking, creativity, empathy, and collaborative work.

Presented below are everyday tasks and activities in the work of university professors where they could use chats to generate various types of content and significantly reduce the time invested in these tasks. Brief recommendations for constructing prompts are also provided.

- Didactic Planning
  - It is crucial to incorporate in the prompt the subject's name, educational level, the number of units, teaching methodologies, and specify the sections required according to the established format. The professor can experiment with various combinations in the order of requesting these characteristics until achieving the most suitable response for their needs.
- Summaries or Outlines
  - It is possible to include specific text in the prompt to obtain summaries or outlines and acquire summarized and structured information.
  - Based on the provided text, assistants can also inquire about common FAQs and provide responses in a question and answer format.
  - It is also possible to request a summary of a text in a certain number of short sentences for later use in a presentation.
- Evaluation.
  - Leveraging the class materials, it is feasible to incorporate texts into the prompts and instruct the assistant to formulate a specified number of multiple-choice questions, completion questions, true or false statements, matching questions, etc.
- Classroom Activities.
  - The prompts are approached in the same manner as mentioned in the preceding paragraphs, requesting suggestions for various classroom activities. Emphasizing the importance of providing the specific topic or text for the assistant to work with (Universidad de Guadalajara, 2023).

### 3. CONCLUSIONS

Generative artificial intelligence provides various opportunities for university professors. Chat-based assistants are capable of generating text, images, code, videos, solving problems, summarizing ideas, and reasoning. These features offer the teaching community significant support in their daily tasks. It is advisable for university professors to start acquainting themselves with these tools so that, with practice, they can effectively integrate them into the teaching-learning process and contribute to preparing students for a highly technological environment.

It is also important to consider that these tools are not yet perfect, and the content they produce should be reviewed before use. It is highly recommended to provide specific texts on which we want to apply them for greater effectiveness. In general, they assist by providing structures and starting points, and as teachers use them, they will refine prompt construction and obtain better responses. It is highly advisable to avoid providing personal information or texts that could be considered of criminal nature during dialogues.

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