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Visual Metaphors and Discursive Strategies in AI Editorial Cartoons: A Cognitive Linguistic Approach

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ABSTRACT

Metaphors significantly shape our understanding of societal issues, influencing how we perceive and react to them. With AI technology becoming increasingly prevalent, it has become a popular subject for cartoonists who use their art to convey diverse opinions about its impact. This study examines how AI is portrayed in editorial cartoons, focusing on visual metaphors, inferred metaphors (i.e., metaphors inferred from the image and/or text), and discursive practices cartoonists employ to communicate their messages. Applying Lakoff and Johnson's metaphor model, the study finds that AI is often depicted with a skeptical or cautionary tone, emphasizing its potential effects on human cognition and creativity. The study identified a variety of visual metaphors in which AI technology is represented as a reflective entity confronted with existential inquiries, a reflective thinker, a liberator/controller of human cognition, an explorer within the labyrinth of human knowledge, the next stage in evolutionary progress, a naïve mind confronted by the weight of human wisdom, an explorer of novel frontiers, akin to the romantic figures of the historical past, and an agent of destruction concerning human knowledge. Cartoonists use discursive strategies such as anthropomorphism, metaphorical representation, intertextuality, symbolism, irony, and humor to express their perspectives and ideological viewpoints on AI technology. The findings highlight the need for ongoing ethical and philosophical reflection as AI becomes more integrated into daily life.

Keywords: Visual Metaphor; Artificial Intelligence; Discursive Strategies; Editorial Cartoons; Cognitive Approach

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1. Introduction

Metaphor is a cognitive phenomenon [1–8]. Thus, the mechanisms underlying metaphors exist in our minds rather than language ([6], p. 76). Therefore, for cognitive theorists, "it is a property of thought rather than of language" ([6], p. 76). For Lakoff and Johnson [5], metaphor is about "understanding and experiencing one kind of thing in terms of another" (p. 5). Metaphors can be represented in other modes besides their verbal modes. To put it in other words, any form of communication can be regarded as an instance of metaphor, if it is able to include a metaphoric concept or thought. Among these forms of communication is editorial cartoons. Editorial cartoons can be considered "pictorial representations that employ visual rhetoric to convey messages that reflect what happens in the society" ([9], p. 148). What occurred in society can be understood, among other meanings, as its pervasive themes. One of them is artificial intelligence (AI) technology.

AI technology prevails over all aspects of our lives; thus, it has become an essential part of societal infrastructure, including communication, healthcare, education, and transportation. Therefore, it has a widespread influence on our modern life [10]. Obviously, this pervasive presence of AI makes it a popular topic for cartoonists worldwide, who explore its themes through employing visual metaphors in their editorial cartoons. Visual metaphors are pictorial versions of verbally expressed metaphorical ways of thinking, which is congruent with the main aim of cognitive metaphor theory. This study examines (1) the visual metaphors utilized by cartoonists from all over the world in depicting AI topics in their editorial cartoons, as well as (2) the discursive practices underlying the cartoonists' perspectives and ideological viewpoints on AI technology. The analysis is conducted using Lakoff and Johnson's [5] metaphor model. The upcoming section outlines the study's objectives.

2. Objectives of the Study

The current study aims to critically analyze a selection of cartoons from Helal's [11] study related to artificial intelligence (AI) technology and its connections to several topics related to literature, books, theories of mind, and the arts from the international online platform, Cartoon Movement. The primary objective is to identify the visual metaphors and discursive practices employed by cartoonists in their depiction of AI as well as its impact on these various themes.

3. Research Questions

To achieve the goals of the study, the present study attempts to answer the following two questions:

RQ1: What are the visual metaphors given in cartoons, and how are they employed by the cartoonists to depict AI- related issues?

RQ2: What are the discursive strategies employed by cartoonists to engage with and comment on AI-related issues in literature, theory of minds, arts, and books within the visual medium?

4. Statement of Research Problem

Despite the fast-growing environment of artificial intelligence (AI), there is a notable lack of scholarly research on how AI is visually represented in media from the point of view of visual metaphors, particularly editorial cartoons that are related to literature, books, theory of minds, arts and creativity. This research gap is significant because such visual metaphors' representations can have a substantial impact on public perception as well as comprehension of AI technology and its effects. The study problem, then, is to address this paucity by examining the visual representation of AI in terms of visual metaphors in editorial cartoons that have a relationship with literature, with theory of minds, with books, and with arts in general.

5. Method of Analysis

5.1. Theoretical Framework

To analyze visual metaphors, Lakoff and Johnson's [5] Conceptual Metaphor Theory (CMT) is employed in the current study. This model is selected for the current study for several reasons. First, it represents an established framework for metaphor analysis as it is considered a widely recognized and influential theory in the field of cognitive linguistics because it provides a robust framework for understanding how metaphors shape human thought as well as communication (see for example, [6, 9, 12–15] among others). Forceville [12] il-

lustrates the applicability of CMT in visual media, showing how abstract concepts can be expressed through imagery. Thus, applying CMT allows for a systematic exploration of how complex concepts, such as AI, are visually represented in cartoons through metaphorical associations. Second, because of its relevance to visual communication which is the focus of the current study. CMT was originally developed for verbal metaphors, but it has been successfully adapted to analyze visual metaphors in various forms of media. For example, Refaie [6] examines political cartoons via CMT and shows its usefulness in examining how complex ideas are simplified and communicated through visual metaphors. Therefore, one can say that CMT offers a clear method for understanding how abstract concepts, such as AI technology, are made more comprehensible through visual imagery. Third, because of its insight into cognitive processing. CMT provides insight into the cognitive processes underlying metaphorical thinking. Thus, it helps in revealing how cartoonists use visual metaphors to influence viewers' perceptions of AI. The focus on how conceptual metaphors shape thought by applying CMT allows uncovering the deeper meanings embedded in the visual representations of AI.

5.2. Data Collection and Procedures

The data given in Helal's [11] study are utilized. They represent 8 editorial cartoons that were published between 2018 and 2024 on a specialized cartoon website 'Cartoon Movement' which is a global platform for editorial cartoons and comics journalism: https://www.cartoonmovement.com/. All cartoons are related to AI and its connection with books, literature, the theory of minds as well as arts. They are produced by cartoonists from different countries around the world: Hungary, Spain, and Italy (representing Western countries), Chile and Brazil (Latin American countries), Morocco (Arabic countries) and Turkey (Islamic countries).

Two criteria were into consideration when choosing each cartoon. They are (1) the cartoon needs to be something AI related and (2) the cartoon must be revolving around literature or books or theory of minds or arts. The search box on the website was filled with words like "artificial intelligence". The site showed cartoons that were related to AI (even without referring to the topics of books, theory of minds, literature, and arts). So, for each of these cartoons, the researcher has taken extreme care in reviewing the cartoons and finally selected only those cartoons that reflect explicit linkage with the topics selected.

The rationale for choosing the website: CM website is an international internet site for the globe's editorial cartoonists to publish materials that are current with news incidents relating to the isms of AI sects in world communities. Some of the cartoons captured by them were by cartoonists in the West (Spain, Hungary, and Italy, for example), Latin America (like Brazil and Chile), Arabic nations (like Morocco), and Islamic nations (like Turkey, for example) The cartoons are focused on a particular aspect of AI technology relating to a given subject during the years 2018–2024: Literature, books, theory of minds the arts.

Selecting eight cartoons – even though a larger sample would be desirable – ensures that the analysis remains focused, yet sufficiently representative applications of AI connected to the topics defined. This reasonable sample size permits a qualitative analysis in depth. Accordingly, this allows the researcher to delve into complexity and diversity without draining meaningful examination from the analysis. Furthermore, a set of eight cartoons enhances the method by making it both structured and reflective. It therefore encompasses key elements of cultural, thematic, and contextual diversity. What was more, cultural diversity had an important role in choosing the cartoons. It provides a collection of cartoonists from a variety of geographical locations and cultural identities; including Western countries (e.g., Hungary, Spain, Italy), Latin America (e.g., Brazil and Chile), Arabic (e.g., Morocco), and Islamic (e.g., Turkey) countries. This diversity guarantees that the analysis captures variations in cultural attitudes, values, and interpretations of AI and their visual metaphors. In conducting the analysis, special care was taken to respect cultural sensitivities. So, the study acknowledges the vastly different sociocultural contexts in which each particular cartoon emerged. This meant reading the cartoons against the grain in terms of their cultural contexts and avoiding oversimplifications (or misrepresentations) that would make them fail their intended messages. This way, with these considerations taken into account, the study is not only stealing echoes of multiple interpretations of AI but also keeping to a sort of ethical and respectful engagement with culturally diverse contents. Furthermore, the cartoons are rich in their visual metaphors which can be

analysed in the current study to unveil the social construction of reality based on the cartoonists' attitudes and assumptions toward AI technology.

6. Literature Review

6.1. Lakoff and Johnson's [5] Metaphor Model

Metaphors encompass more than mere linguistic constructs; they are integral to human cognition and understanding [5, 13, 16–27]. Being fundamental to human thought processes, metaphors; thus, enabling deeper insights into complex phenomena [18]. Lakoff and Johnson [5] define metaphor as "understanding and experiencing one kind of thing in terms of another" (p. 5). As a result, their Conceptual Metaphor Theory (CMT) represents a fundamental framework within the realm of cognitive linguistics, positing that metaphorical reasoning profoundly influences our experiences and perceptions of reality (i.e., the world) [5]. A significant aspect of this theory is the concept of 'metaphors as conceptual tools' [3, 5], suggesting that metaphors exert considerable impact on our perceptions, thoughts, and actions [3, 5, 28–30]. Metaphors serve not merely as a decorative language but are essential for elucidating abstract concepts through tangible examples, thereby organizing our experiences [3, 5, 13, 31, 32]. Moreover, many conceptual metaphors originate from our physical and social interactions. For example, the metaphor "LOVE IS A JOURNEY" allows for the understanding of relationships as akin to travel, complete with obstacles and rewards ([3], p. 5). This focus on embodied experience represents another key principle of the theory [5]. Lakoff and Johnson [5] propose that abstract thought and language are rooted in bodily experiences. This is a concept they term 'embodied experience'. They argue that metaphors are not just linguistic tools but are based on our physical interactions with the world, influencing how we think and speak. Common experiences lead to *primary metaphors*, such as associating warmth with affection or height with quantity, which is universal because of shared human biology. They argue that our repeated physical interactions create *image schemas*—like the up-down or container schemas—that shape our metaphorical understanding of concepts. Thus, this theory challenges traditional ideas of mind-body separation, emphasizing that physical experience is fundamental to cognitive and linguistic processes. Also, a much important feature of CMT is the distinction between source and target domains. Metaphor, in this framework, consists of two things: (1) a source domain, which is the source of the metaphorical language, and (2) a target domain, which is the domain of understanding. For example, in "life is a cone of ice-cream" (the source is 'a cone of ice-cream', the target is 'life') the term 'a cone of ice-cream' is the source domain, the thing that does the metaphorical translation, and 'life' is the target domain, the thing being understood through metaphor ([33], p. 18). Another important aspect of CMT is the systematic nature of conceptual metaphors, which form incorporated systems of thought [5]. Related to this, the theory described how metaphors shape people's perception of reality and therefore affect their thoughts and actions. Metaphors facilitate the ongoing processes of constructing and reorganizing our comprehension of the world [5, 20, 34]. Thus, CMT illustrates the significant role of conceptual metaphors in shaping cognition and everyday experiences. In addition to that, CMT argues that metaphors are indispensable for individuals' interpretation of their environment.

6.2. Visual Metaphor

Visual metaphor, also called "pictorial" metaphor ([35], p. 464), "involves a mapping of information transferred from one image to another" i.e., "the source image and target image respectively" ([36], p. 156). Obviously, it is a type of metaphor in which something/idea is visually portrayed as a target and compared to another thing/idea that entirely belongs to another category which represents the source; thus, visual association is mapped from the source to the target. Therefore, a visual metaphor is considered visual fusion of elements from two separate areas into one single entity [37]. However, Refaie [6] considers the definition of visual metaphor, from the point of view of visual fusion although being very common in political cartoons [38], as a restricted definition and argues that visual metaphor depends on more implicit form: "most visual metaphors do not contain a fusion of two separate elements into one, because either the vehicle or, more commonly, the topic is not shown explicitly at all" ([6], p. 79). For Refaie [6], the concept of visual metaphor is considered not only an extraordinarily difficult concept, but also an elusive one to deal with. Alousque ([39], p. 368) summarizes the interaction of the source and target domain, following Forceville [40] and Phillips and McQuarrie [41], as

follows:

(1) Replacement, in which only one domain is expressed visually because one of the images - generally the source image - is not present.
(2) Juxtaposition, in which the two domains are expressed separately.
(3) Fusion, in which the two domains are visually integrated.

Forceville ([42], pp. 464–468), (as cited in [39], pp. 368–369) categorizes visual metaphors into four distinct types:

a) A contextual metaphor, where both the target and source can be discerned solely through visual elements, may nonetheless necessitate contextual information for comprehensive interpretation.
b) A hybrid metaphor is characterized by the physical amalgamation of the target and source into a singular object.
c) A pictorial simile conveys a resemblance between the target and source through the formal similarities of their respective images.
d) An integrated metaphor depicts a holistic representation of a unified object, such that it bears resemblance to another object even in the absence of contextual indicators.

The visual metaphors and the inferred metaphors (i.e., metaphors inferred from the image and/or text) in the editorial cartoons in the current study are analysed from the point of view of Lakoff and Johnson's [5] Conceptual Metaphor Theory (CMT). According to CMT, the ability to employ metaphors is a fundamental cognitive function inherent to human beings, essential for the process of conceptualization. To put it in Forceville and Jeulink's [43] words "metaphorizing is an indispensable human faculty for conceptualization" (p. 37).

6.3. Discursive Strategies

Discursive strategies "represent the linguistic resources used by the author in order to maximize the effectiveness of the messages" ([44], p. 209). They are employed in communication with the aim of shaping meaning. Additionally, they create associations, and influence interpretation. In addition to metaphorical representation, which is discussed above, anthropomorphism, intertextuality, symbolism, irony and humor, are examples of discursive practices; they all play a distinct role in how discourse is constructed as well received. Anthropomorphism is the attribution of human traits to non-human entities (e.g., animals, objects, or even abstract concepts); thus, it aims at fostering relatability and emotional engagement with the audience.

The following editorial cartoon (**Figure 1**), entitled "hAImlet", was published by Alagon, a cartoonist from Italy, on CM/24 January 2023.

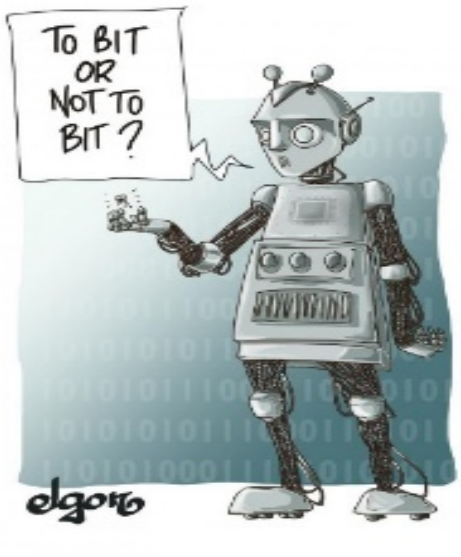

Figure 1. "hAImlet".

In **Figure 1**, the robot, which is non-human, is presented in a human like pose; furthermore, it (the robot) expresses human words. Thus, **Figure 1** is an example of the use of anthropomorphism. As for intertextuality, it refers to shaping of a text's meaning by incorporating other texts, including quotations, allusions, or direct parallels to existing works. Thus, it establishes connections between texts. For example, the connection created by the cartoonist in the cartoon of **Figure 1** and Shakespeare's 'Hamlet' by direct parallel to the expression "To be or not to be" by the use of the words "To Bit or Not to Bit?" given by the robot. Symbolism refers to using symbols to convey deeper meanings indirectly. Thus, it often evokes emotional responses and cultural associations. For example, in literature, an olive branch can symbolize peace. As for irony, through indirect or opposite meanings, it adds complexity, critiques ideas, or highlights contradictions. Humor uses amusement to lighten

discourse, to make it approachable, to create rapport, and to enhance engagement or to critique through. To sum up, discursive strategies shape how messages are conveyed as well as understood. Each discursive strategy able to bring unique rhetorical effects to discourse. Thus, discursive practices allow for more engaging, and often more persuasive communication.

6.4. Previous Studies

Various studies have examined societal perception of Artificial intelligence (AI) technology (e.g., [45–49]). In their study, Moravec et al. [47] reached the conclusion that AI awareness is influenced by gender, age, and education level; thus, younger individuals and those with lower education levels show less familiarity with AI applications. Wen and Chen [49] investigate public perceptions of AI in Taiwan. The focus of the study is on the roles of political ideology, science news consumption, and knowledge. The study reaches the conclusion that (1) political ideology has a limited impact on AI benefit perceptions and that (2) science news consumption and knowledge influence AI perceptions significantly. Seth [48] investigates societal attitudes towards AI by examining public perception of AI across ten countries via a global survey. The study concludes that while many view AI as a transformative tool, there is also a strong sentiment advocating for regulation due to concerns about job displacement as well as societal risks. Eom et al. [45] present a comprehensive overview of public opinion trends on AI in US. Their study is based on fifteen surveys that were conducted in the USA over the past four years. The findings reveal a divided American public regarding AI's applications. Americans generally call for more regulation and government oversight, expressing a need for increased measures before fully embracing AI. While specific AI applications, such as skin cancer screening, have been welcomed, most Americans emphasize the importance of addressing societal concerns such as racial bias and inequities before the widespread implementation of AI. The evolving landscape of AI necessitates ongoing monitoring of public sentiment and the consideration of societal implications. Kanzola et al. [46] examine public attitudes towards AI in Greece. The study reaches the conclusion that social identity factors (including economic and political standings) significantly influence public attitudes towards AI.

Although the above-mentioned studies have investigated the societal perception debate of AI, they did not examine visual metaphors from a cognitive perspective with the application of Lakoff and Johnson's [5] metaphor model to editorial cartoons that are related to Artificial intelligence (AI) technology. No single study to date has examined visual metaphors of AI technology in relation to several topics related to literature, books, theories of mind, and the arts in editorial cartoons. Thus, the present study aims to fill this gap. The aim is to examine how AI is portrayed in editorial cartoons, focusing on visual metaphors, inferred metaphors, and discursive practices employed by caricaturists in depicting AI-related issues in literature, books, theories of mind, and the arts.

7. Data Analysis, Results and Discussion

In this section, **eight** editorial cartoons that depict AI within the realm of literature, books, the theory of minds, and arts will be listed and numbered from 1 to 8 (cartoon 1 is given in 6.3 section). Furthermore, the analysis of the source domain, target domain, metaphor and discursive strategies used in the visual domain related to each cartoon following the framework of Lakoff and Johnson's [5] conceptual metaphor theory will be given. Finally, general results and discussion will be given.

7.1. Editorial Cartoon (1)

See **Figure 1** which represents editorial cartoon one. In **Figure 1**, we can see a robot holding a small object while pondering the phrase, "To Bit or Not to Bit?". Obviously, this phrase serves as a witty adaptation of Shakespeare's line, "To be or not to be?" from 'Hamlet'; thus, analysing the cartoon following CMT, we can assume that the overarching visual metaphor in this editorial cartoon is **AI TECHNOLOGY IS A REFLECTIVE ENTITY CONFRONTED WITH EXISTENTIAL INQUIRIES**. The **source domain** is grounded in human existential dilemmas, as prominently illustrated in Shakespeare's 'Hamlet'. The invocation of the phrase "To be or not to be" aligns the robot's contemplation with classical human struggles concerning existence, choice, and morality. Conversely, the **target domain** concerns the decision-making process and potential consciousness of AI.

The robot's contemplation serves as a metaphorical representation of AI attaining a level of sophistication that allows for self-reflective thought. The metaphor of the cartoon not only anthropomorphises AI but also elevates its status to that of an entity capable of introspective and philosophical exploration. The cartoon employs four **discursive strategies**. These are **(1) anthropomorphism**, **(2) intertextuality**, **(3) irony**, and **(4) humor**. Anthropomorphism is apparent in the human-like pose and expression of the robot, while intertextuality is created through the reference to 'Hamlet'. The irony lies in the juxtaposition of a machine (which is a product of human innovation and rationality) engaging in a distinctly human existential crisis. Humor permeates the cartoon through this incongruity. Obviously, the cartoon posits that as AI technology progresses, it may encounter dilemmas traditionally regarded as uniquely human, encompassing inquiries about existence, purpose, and ethical decision-making. Such contemplations provoke profound questions regarding the nature of intelligence and the potential for machines to cultivate forms of consciousness or self-awareness akin to that of humans.

In conclusion, a visual metaphor to depict AI as a reflective entity facing existential questions is cleverly employed by the cartoonist, Alagon, in his editorial cartoon. By adapting Shakespeare's iconic phrase as well as employing discursive strategies like anthropomorphism, intertextuality, irony, and humor, the cartoon suggests that as AI evolves, it may engage with dilemmas traditionally considered human. This raises profound questions about the nature of intelligence and the potential for machines to develop forms of consciousness or self-awareness akin to humans.

7.2. Editorial Cartoon (2)

The following editorial cartoon (**Figure 2**), entitled "Artificial intelligence: To be or not to be", was published by Omar Perez, a cartoonist from Spain, on CM/4 February 2018.

In editorial cartoon (2), the viewers can see a robot, representing AI, which is adopting a pose that mirrors Rodin's famous sculpture, 'The Thinker'. Thus, it depicts AI (represented by the robot) as a philosophical entity. This is also supported by the description given in the title in which the cartoonist refers to the point that the robot is thinking of Hamelt's phrase 'to be or not to be'. Thus, the cartoon suggests that AI (represented by the robot) is grappling with its own existence[11]. The cartoonist employs a visual metaphor as well as three discursive strategies in this editorial cartoon with the aim of exploring deeper philosophical questions about AI and consciousness. The visual metaphor is **AI TECHENOLOGY IS A REFLECTIVE THINKER**. The **source domain** for this metaphor is human existential reflection which is epitomised by Rodin's The Thinker, a symbol of deep thought and intellectual engagement. The **target domain** is AI's potential for self-awareness and introspective thought. By positioning the robot in a pose traditionally associated with human philosophical inquiry, the cartoonist uses the metaphor of 'AI as a reflective thinker' to suggest that AI could develop a form of self-reflection akin to human introspection. Concerning **the discursive strategies** employed in the cartoon, one can say that several strategies are cleverly employed by the cartoonist to convey the cartoon's message which that AI robot's depiction as a reflective thinker. The use of **anthropomorphism** which is evident in the portrayal of AI as a human. Obviously, we can see the pose of the robot in the cartoon which is similar to humans. Thus, this human-like portrayal suggests that AI might possess human-like cognitive abilities. Another discursive strategy employed in the editorial cartoon is **intertextuality**. It is achieved through the visual reference to 'The Thinker'. Obviously, this reference provides a cultural and intellectual context that enriches the viewer's understanding of the robot's contemplative state. Additionally, **symbolism** is employed in the cartoon. This is achieved by the robot's position on a pedestal under a spotlight. It suggesting both elevation and isolation. These are metaphors for intellectual pursuit and existential solitude.

Figure 2. "Artificial intelligence: To be or not to be".

To sum up, in the editorial cartoon "Artificial intelligence: To be or not to be", visual metaphor and discursive practices are employed to depict AI as a philosophical entity. By portraying a robot in the pose of Rodin's "The Thinker" and referencing Hamlet, the editorial cartoon explores AI's potential for self-awareness and introspection. Through anthropomorphism, intertextuality, and symbolism, the cartoon raises questions about AI's cognitive abilities and its place in philosophical inquiry, suggesting a future where AI contemplates existence much like humans do.

7.3. Editorial Cartoon (3)

The following cartoon (**Figure 3**), entitled "Artificial Intelligence: Theory of Mind and Artificial Intelligence", was published by Derkaoui Abdellah, a cartoonist from Morocco, on CM/8 May 2024.

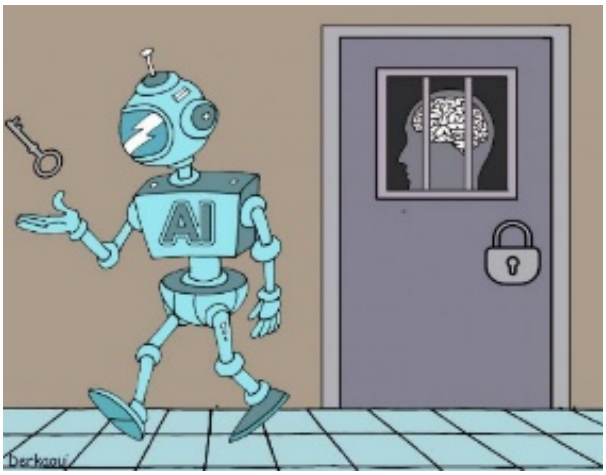

Figure 3. "Artificial Intelligence: Theory of Mind and Artificial Intelligence".

In the cartoon of **Figure 3**, there is a robot holding a key in front of a door, beyond which lies a human brain visible behind bars. The robot, clearly identifiable as an AI entity through its industrial design and technological attributes, holds the key (both in a literal and figurative sense) to gaining access to or unlocking the human mind[11]. Thus, AI is positioned as an entity capable of either liberating or constraining human cognitive processes (see[11]). The visual metaphor in this cartoon is **AI TECHENOLOGY IS A LIBERATOR OR CONTROLLER OF HUMAN COGNITION.** The **source domain** is grounded in human cognition and decision-making, exemplified by the locked door and the barred brain, which embodies the intricate and often protected domains of human thought. Conversely, the **target domain** pertains to AI's potential to comprehend, ingress, or even exert control over these cognitive processes. The metaphor is pivotal to the cartoon's message as it implies that AI possesses the key to deciphering the complexities of the human mind while simultaneously evoking considerable ethical dilemmas. Also, various **discursive practices** can be analysed in the editorial cartoon of **Figure 3**. Mapping the discursive strategies we find in the cartoon, we can identify **(1) symbolic conflict**, **(2) irony**, and **(3) visual metaphor**. The symbolic conflict is about the tension between an AI robot – a symbol of technological progress – and the locked door and barred brain. The irony is about the situation in which the AI (a machine, therefore the product of human innovation and design) holds the key to the human mind. The image suggests that humans are no longer under control; their brain is held captive by the very machines they created. Using a key as the gadget to represent a machine that acquires access to the human mind is also a visual metaphor about access and authority, and forces us to ponder the consequences of machines that can increasingly replicate what seems to fall in the realm of the 'human'.

In conclusion, to explore AI's potential influence on human cognition, visual metaphor is employed in this caricature, "Artificial Intelligence: Theory of Mind and Artificial Intelligence". By depicting a robot holding a key to a barred human brain, the cartoonist symbolizes AI as a possible liberator or controller of human thought. Through symbolic conflict, irony, and visual metaphor, the cartoon highlights the tension between technological advancement and ethical considerations. Thus, this editorial cartoon prompts reflection on AI's growing capabilities and their implications for autonomy and control.

7.4. Editorial Cartoon (4)

The following cartoon (**Figure 4**), entitled "Artificial intelligence and books: Artificial intelligence in the labyrinth of ideas and books", was published by J. Bosco, a cartoonist from Brazil, on CM/7 June 2024.

The visual metaphor here in this editorial cartoon is: **AI TECHENOLOGY IS AN EXPLORER WITHIN THE LABYRINTH OF HUMAN KNOWLEDGE.** The **source domain** of the metaphor pertains to human intellectual endeavors, encapsulated by the representations of the brain

and books (as they are symbols embodying knowledge, culture, and intellectual complexity). Conversely, the **target domain** signifies AI's potential capacity to navigate and comprehend these intricate human knowledge systems. This visual metaphor intimates that while AI possesses the ability to traverse this intellectual landscape, it may not achieve a comprehensive understanding of all its subtleties and complexities. The **discursive strategies** that are analyzed here are: **(1) anthropomorphism** – the robot that is depicted has a look of pensive, human reflection, suggesting some cognitive capacity for engaging with human knowledge; **(2) symbolism** – in the brain and books, referring to human intellect and human cultural legacy; **(3) contrast** – the mechanical attributes of the robot are in distinction with human cognition and its organic, multifaceted nature, the implied theme being exploration and potential misconstruction; and **(4) irony** – although AI can access data repositories, it is said not to have the kind of experiential understanding that is gained through human lived experience and culture.

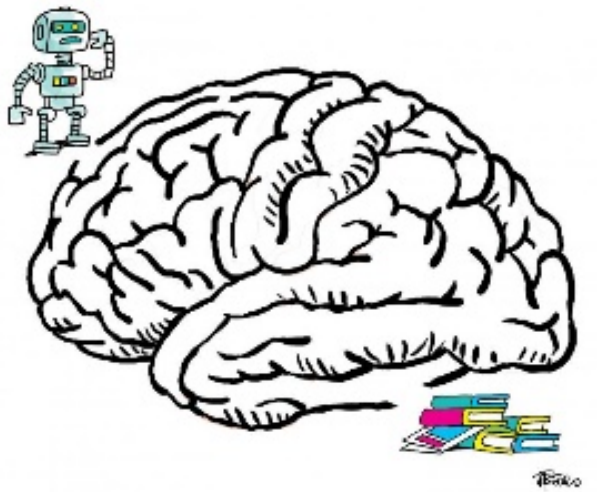

Figure 4. "Artificial intelligence and books: Artificial intelligence in the labyrinth of ideas and books".

In short, the editorial cartoon uses a complex visual metaphor to describe AI as a kind of intrepid human explorer on the shorelines of human learning and knowledge. Both anthropomorphism and symbolism, as well as contrast and irony, are evident in the ways that the cartoon portrays the cognitive capacity for AI to cross into the land of the human brain – and human books – to expand its intellectual horizons. It also reveals critical tensions, though, where AI may or may not ever fully access the richness of human learning – specifically, its cultural connotations and cognitive nuances. This portrayal underscores the ongoing discourse on AI's role in understanding and interpreting human intellectual endeavors.

7.5. Editorial Cartoon (5)

The following editorial cartoon (**Figure 5**), entitled "Odyssey", was published by Alen Lauzán, a cartoonist from Chile, on CM/6 May 2023.

Figure 5. "Odyssey".

In the cartoon, there is a robot kneeling in a barren landscape scattered with bones, holding a bone in its hand. This imagery is a direct reference to a scene from Stanley Kubrick's 2001 [50]: A Space Odyssey, where a primitive hominid discovers the use of a bone as a tool, symbolizing the dawn of human technological innovation (see Helal [11] for full analysis of visual representation of three meanings: representational, interactive and compositional). The cartoon reflects the visual **metaphor: AI TECHENOLOGY IS THE NEXT STAGE IN EVOLUTIONARY PROGRESS.** The **source domain** of the metaphor is evolution and human technological progress, as depicted in 2001: A Space Odyssey. By referencing this cultural artifact, the cartoon situates AI within a broader historical and evolutionary narrative. Thus, the cartoon suggests that AI represents the next stage in human development. The **target domain** is AI's role in human-like innovation or destructive behaviors. The metaphor given in the cartoon positions AI as a successor to early human tools, capable of shaping the future in profound ways. The **discursive strategies** deployed in this cartoon include the following: **(1) intertextuality**: a direct visual reference to the film 2001: A Space Odyssey [50] provides a

cultural and intellectual framework to understand what's happening in the cartoon; **(2) symbolism**: the shape of the bone together with the barren landscape stand both as a promise of innovation and an allegorical warning of the consequences of technological misuse; and **(3) irony**: hidden in the cartoon is the paradox of technological progress (progress is possibly destructive). We might say that if AI is anything like our tools of the past, it has the power to both drive further technological progress and potentially lead to unintended destructive outcomes.

In summary, the editorial cartoon Odyssey, by Alen Lauzán, employs a visual metaphor to cast AI as evolution's next step, connecting the concept of AI to the narrative of human technological development through intertextual references such as Stanley Kubrick's 2001 [50]: A Space Odyssey. Through symbolism and irony, the cartoon highlights AI's dual potential for innovation and destruction, reflecting on the profound impact AI may have on shaping the future. This portrayal underscores the complexities and ethical considerations inherent in technological evolution.

7.6. Editorial Cartoon (6)

The following editorial cartoon (**Figure 6**), entitled "AI", was published by Hamit GIŞ a cartoonist from Turkey, on CM/2 December 2023.

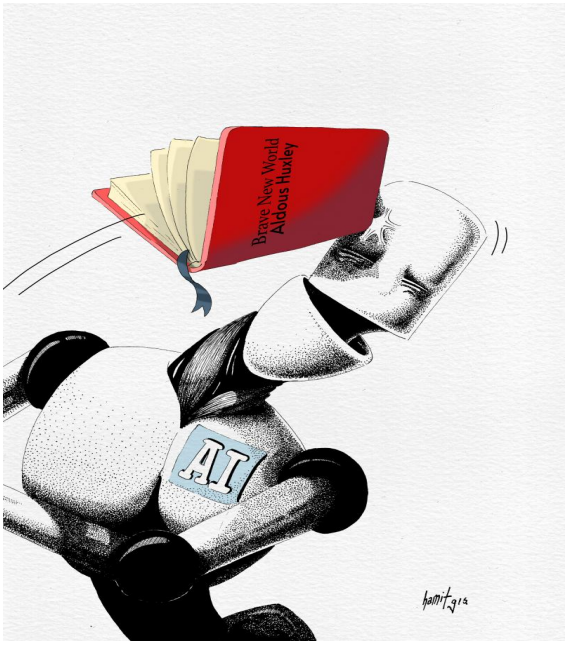

Figure 6. "AI".

The editorial cartoon (6) depicts a robot, representing AI, adopting a defensive posture in the presence of a book entitled 'Brave New World' by Aldous Huxley. This encounter epitomizes the dilemmas faced by AI when it engages with human intellect and cultural artifacts. The cartoonist was successful in his selection of Huxley's literary work, as it provides a critical analysis of technological dystopia (see details in Helal [11]). The cartoon employs a visual metaphor in which AI finds itself challenged by human ethics and cultural narratives. This visual metaphor can be **AI TECHENOLOGY IS A NAÏVE MIND CONFRONTED BY THE WEIGHT OF HUMAN WISDOM.** The **source domain** of human learning and intellectual engagement, embodied in the act of reading a book, is juxtaposed against the **target domain** of AI's interaction with human wisdom as well as cultural and ethical paradigms. The selection of 'Brave New World' as a symbolic reference further intensifies this metaphor, critiquing the overreach of technology and the potential erosion of humanity.

The cartoon employs the **discursive methods** of **(1) intertextuality**, **(2) symbolisation**, **(3) irony**, and **(4) commentary** to underscore the potential incongruity between an AI's utilitarian capabilities and the normative values essential to human culture. The strategy of intertextuality is actually represented by this cartoon's image of the AI reading Aldous Huxley's Brave New World, an early exploration of a dystopian future produced by technology and control. Locating it within this narrative of caution about technology situates the AI technically within a narrative that likely implies an ethical problem or dilemma.

As for the discursive strategy of using symbolism, it is obvious that in the editorial cartoon, there are key symbols. These are the book and the robot itself. The book represents human knowledge and culture, including human ethics. The robot is symbolic of AI's ability to 'read' that knowledge. The implication that AI might be able to access this book is an index that we might've figured out how to represent human knowledge in technology, but that AI might still miss out on the human ethical values integral to the knowledge itself. As for irony, it would likely be represented by the AI reading a dystopia about a bleak, over-controlled, scientifically altered and managed future. The AI is reading about the dissonance between human ethical values and the technical capabilities of AI. The irony, then, represented in this

cartoon is that despite AI's technical capabilities, it might be unable to assimilate the deeper ethical questions posed by human literature about the very AI it reads about. Lastly, we might infer that the editorial cartoon encodes a commentary on discord between AI's technical capabilities and the human ethical values of culture. By having the AI read Brave New World, a canonical piece of literature problematising the effects of technology on society, the question is raised about whether AI could actually assimilate the human ethical values of human culture, alluding to the continuing debate about the role AI should play in shaping the future.

Overall, the cartoonist skillfully drew upon the discursive practices of intertextuality, symbolism, irony and commentary to point to the strains that AI can experience as it becomes immersed in human culture and ethics. Placing an AI in a defensive stance with the book Brave New World in the foreground, the cartoonist calls focused attention to the tensions between technology and ethics. Huxley's work also functions as a form of criticism, warning against technological hubris. The choice of Huxley signals possible misalignments between the scope of AI's capabilities and the nuanced values of human society. The visual metaphor encourages reflection on the role of AI in remaking the paradigms of culture and ethics.

7.7. Editorial Cartoon (7)

The following editorial cartoon (**Figure 7**), entitled "Wanderer above the Sea of Fog", was published by Alen Lauzán, a cartoonist from Chile, on CM/31 May 2023.

In this cartoon of **Figure 7**, the visual metaphor is **AI TECHENOLOGY IS AN EXPLORER OF NOVEL FRONTIERS, AKIN TO THE ROMANTIC FIGURES OF THE HISTORICAL PAST.** Therefore, the **source domain** is romantic notions of exploration and contemplation, influenced by Caspar David Friedrich's work (i.e., the painting 'Wanderer above the Sea of Fog' by Caspar David Friedrich). The contemplative posture of the robot, which symbolizes artificial intelligence, suggests a narrative focused on exploration (or introspection).

The **target domain** is the endeavors of AI in probing new technological and philosophical dimensions. Obviously, the cartoonist uses several **discursive strategies: (1) intertextuality**, **(2) romanticism**, and **(3) themes of the sublime**. The cartoon references a romantic painting, reminiscent of Caspar David Friedrich's works, which often depict solitary figures contemplating vast landscapes. This allusion situates AI within a historical context of exploration and discovery, drawing parallels between human and technological quests for knowledge. Moreover, the invocation of the romantic era, specifically the individualistic, sentimental and exploratory goals of the sublime, further frames the robot's characterisation as a 'modern romantic' in the sense that AI is posited as both a literal techno-explorer and a piece of technology that invites contemplation. Additionally, the vast, awe-inspiring landscape underscores the sublime. This is a key romantic theme that captures the mixture of beauty and terror in facing the unknown. These discursive strategies, coupled with the visual metaphor, are employed to convey that AI, like humanity, embarks on an expedition into uncharted realms. The allusion to a romantic painting amplifies the exploration and sublime themes, positioning AI as a contemporary iteration of a "romantic" figure within the narrative of discovery.

Figure 7. "Wanderer above the Sea of Fog".

All in all, the cartoonist effectively uses the visual metaphor of AI as an explorer of novel frontiers, drawing parallels to romantic figures of the past. By referencing Caspar David Friedrich's work, the cartoonist employs intertextuality, romanticism, and themes of the sublime to illustrate AI's journey into uncharted technological and philosophical realms. This portrayal positions AI as a modern "romantic" figure, reflecting its evolving role in navigating and contem-

plating new dimensions of discovery.

7.8. Editorial Cartoon (8)

The following editorial cartoon (**Figure 8**), entitled "book", was published by Gergely Bacsa, a cartoonist from Hungary, on CM/5 August 2024.

Figure 8. "book".

The viewers can see in the cartoon a robot which is engaged in drilling into an elaborate and substantial book. This portrayal can serve as a visual metaphor for an act of destruction (or deconstruction). Thus, **AI TECHENOLOGY IS AN AGENT OF DESTRUCTION CONCERNING HUMAN KNOWLEDGE** is the visual metaphor of the cartoon. The **source domain** is the safeguarding of human knowledge and culture, epitomized by the large, ancient book. The **target domain** is the potential of AI to subvert or modify human knowledge. The cartoonist utilizes various **discursive techniques** such as **(1) symbolism**, **(2) visual metaphor**, **(3) irony**, and **(4) critique**. The ancient book symbolizes the extensive collection of human knowledge and culture. The robot, by drilling into it, represents a disruptive force that could potentially harm or change this collection. The drilling action serves as a metaphor for destruction or deconstruction. This imagery implies that AI has the capability to penetrate and possibly dismantle established knowledge systems. This raises concerns about its effect on the integrity of human intellectual heritage. There is an ironic contrast between AI, which is designed to enhance and preserve knowledge, and its portrayal as a destructive force. This irony underscores the unintended consequences of technological advancement, where tools meant to assist humanity might inadvertently harm it. Clearly, the cartoon critiques the uncritical acceptance of AI technologies. By doing that, it (the cartoon) stresses the importance of carefully considering how AI interacts with and alters human knowledge. The cartoon suggests that without thoughtful oversight, AI might distort or erode the cultural and historical context of valuable archives. One could argue that the purpose of employing these discursive techniques is to express the potential negative effects of AI's interaction with human knowledge. The act of penetrating the book symbolizes a destructive approach. Additionally, it implies that AI might undermine or misrepresent invaluable cultural and historical archives.

To sum up, the cartoon effectively highlights the potential risks AI poses to human knowledge through its use of symbolism, visual metaphor, irony, and critique. By portraying AI as a force capable of deconstructing cultural and historical archives, it underscores the need for careful oversight and thoughtful integration of AI technologies. This cautionary perspective serves as a reminder of the delicate balance required to harness AI's benefits while safeguarding the integrity of human intellectual heritage.

7.9. General Results and Discussion

The analyses of selected cartoons from a cognitive perspective with a special focus on visual/pictorial metaphors on AI and its connections with other entities reveal both opportunities and challenges in how AI is perceived by cartoonists around the globe from different countries. Furthermore, a consistent theme emerges which is the complex relationship between AI and human knowledge, culture as well as ethics. The study identified a variety of visual metaphors in which AI technology is represented as a reflective entity confronted with existential inquiries (**Figure 1**), a reflective thinker (**Figure 2**), a liberator/controller of human cognition (**Figure 3**), an explorer within the labyrinth of human knowledge (**Figure 4**), the next stage in evolutionary progress (**Figure 5**), a naïve mind confronted by the weight of human wisdom (**Figure 6**), an explorer of novel frontiers, akin to the romantic figures of the historical past (**Figure 7**), and an agent of destruction concerning human knowledge (**Figure 8**). Additionally, car-

toonists present AI technology as both a beneficial tool for future development and a possible threat to creativity.

The below table (**Table 1**) show the readers the percentage of discursive strategies in the corpus of the study.

Table 1. Discursive strategies in selected editorial cartoons of AI technology.

No.	Discursive Strategy	Frequency of Occurrence	Percentage	Figures
1.	**Metaphorical representation**	8	100%	1, 2, 3, 4, 5, 6, 7, and 8
2.	**Intertextuality**	5	62.5%	1, 2, 5, 6, and 7
3.	**Anthropomorphism**	3	37.5%	1, 2, and 4
4.	**Irony**	5	62.5%	1, 3, 4, 5 and 6
5.	**Humor**	1	12.5%	1
6.	**Symbolism**	5	62.5%	2, 4, 5, 6, and 8
7.	**Symbolic conflict**	1	12.5 %	3
8.	**Contrast**	1	12.5%	4
9.	**Commentary**	1	12.5%	6
10.	**Romanticism**	1	12.5%	7
11.	**Themes of the sublime**	1	12.5%	7
12.	**Critique**	1	12.5%	8

Obviously, various discursive strategies and their frequency of occurrence in a given set of figures are given. There are 12 strategies in the corpus of the study. The strategy of ***Metaphorical representation*** appears most frequently, occurring in all 8 figures (100%). This highlights its dominant presence in the analysis. Also, it asserts that visual metaphors play a crucial role in how the viewers understand and interpret AI technology. This result is consistent with Helal's [51]. A relatively high frequency (62.5%) is devoted to the discursive strategies of ***Intertextuality, Irony*** and ***Symbolism*** (each occurs in 5 figures). This indicates the importance of these strategies in representing AI technology as explained in detail in the analysis each figure. In three figures (**Figures 1**, **2**, and **4**), the discursive strategy of ***Anthropomorphism*** is employed by the cartoonists as it allows them to attribute human qualities to AI technology. Thus, the use of Anthropomorphism suggests that AI could achieve human-like thought. Other discursive strategies, such as ***Critique, Humor, Symbolic conflict, Commentary, Romanticism, Themes of the sublime*** appear with a low frequency of occurrence (12.5%). This points to their rarity in the selected editorial cartoons analyzed. Generally, one can say that the diversity in these discursive strategies illustrates the complex and varied ways in which AI technology is communicated across different cartoons that are related to literature, books, theory of minds, and arts. Moreover, the use of these discursive strategies underscores the tension between AI technological advancement and the preservation of human culture, ethics, and cognitive autonomy.

8. Significance of the Study

The significance of this study lies in its contribution to the growing discourse on artificial intelligence (AI) technology as well as its visual portrayal through visual media, i.e., editorial cartoons. Obviously, several studies have examined the societal perception debate regarding AI (as discussed in the section entitled 'previous studies'). Despite the existence of several studies that have examined societal perception debate regarding AI, those studies did not investigate pictorial metaphors or inferred metaphors from a cognitive perspective with the application of Lakoff and Johnson's [5] metaphor model to editorial cartoons that are related to Artificial intelligence (AI) technology in relation to literature, books, theories of mind, and the arts. Thus, the current study aims to fill in this gap by examining how AI is portrayed in editorial cartoons with a focus on visual metaphors, inferred metaphors, and discursive practices employed by caricaturists in depicting AI-related issues in literature, books, theories of mind, and the arts. Thus, the study offers valuable insights into public perceptions of AI and the narratives that shape societal attitudes. This is achieved by understanding the visual metaphors used in these cartoons. Furthermore, the study contributes to cognitive linguistics and visual communication research by its application to the framework of Conceptual Metaphor Theory (CMT). The study demonstrates how abstract concepts (such as AI's role in human knowledge as well as creativity) are made accessible to the public through visual imagery given in the editorial cartoons. Furthermore,

the findings underscore the importance of editorial cartoons because of their role in reflecting and shaping societal views on technological developments represented by cartoonists from different countries. Additionally, the study highlights the need for ethical reflection as AI becomes more integrated into everyday life. Also, it encourages a deeper understanding of the complexities involved in AI development. This is achieved by analysing how cartoonists portray both the benefits and risks of AI technology in their editorial cartoons. The insights from the current study not only inform discussions about AI governance, but also, more importantly, sheds light on the important role of visual media in framing public discourse on emerging AI technologies.

9. Conclusions

The present study, from a cognitive approach, investigates the visual/pictorial metaphors as well as the discursive practices on AI and its connections with other entities found in the editorial cartoons published in Cartoon Movement and previously selected in Helal [11]. Eight cartoons were studied applying the metaphor theory by Lakoff and Johnson [5]. The visual metaphors and discursive practices used to depict AI themes in relation to literature, books, theory of minds, and arts are analyzed. The analysis provides insights into the ways AI is portrayed through metaphoric expressions. It also reveals both opportunities and challenges in how AI is perceived by cartoonists around the globe from different countries. One can say that across all eight editorial cartoons, a consistent theme emerges that is the complex relationship between AI and human culture, knowledge, and ethics.

In response to research question 1: 'What are the visual metaphors given in cartoons, and how are they employed by the cartoonists to depict AI-related issues?', the study identified a variety of visual metaphors. These are metaphors of AI as a reflective entity confronted with existential inquiries (see **Figure 1**), as a reflective thinker (**Figure 2**), a liberator or controller of human cognition (**Figure 3**), an explorer within the labyrinth of human knowledge (**Figure 4**), as the next stage in evolutionary progress (**Figure 5**), as a naïve mind confronted by the weight of human wisdom (**Figure 6**), as an explorer of novel frontiers, akin to the romantic figures of the historical past (**Figure 7**), and as an agent of destruction concerning human knowledge (**Figure 8**). Cartoonists also present AI as both a beneficial tool for future development and a possible threat to autonomy and creativity. For instance, robots depicted engaging with literary works or philosophical ideas illustrate how AI is symbolically associated with human cognitive abilities. This visual strategy demonstrates a complex narrative: AI, though man-made, is portrayed as evolving toward an identity that mirrors human qualities.

In response to research question 2 of the study, which is related to the identification of the discursive strategies employed by cartoonists, one can say that from the examination of the editorial cartoons, it is obvious that the cartoonists employed multiple discursive strategies. Their aim of using these multiple discursive practices is to comment on AI's role in various fields related to literature, arts, and cognition. These strategies are *anthropomorphism* (as explained in **Figures 1**, **2**, and **4**)*, metaphorical representations* (as in all **Figures 1 to 8**), *intertextualit*y (**Figures 1**, **2**, **5**, **6**, and **7**), *symbolism* (**Figures 2**, **4**, **5**, **6**, and **8**) *irony* (**Figures 1**, **3**, **4**, and **5**) *and humor* (**Figure 1**). Obviously, these above-mentioned strategies allow the cartoonists to convey their messages about AI's integration into human intellectual domains. Anthropomorphism is used to attribute human qualities to AI. Thus, it suggests that AI could achieve human-like thought. Intertextuality, such as references to classical texts and artworks, adds depth to the cartoons. This is mainly because they connect AI's development with broader cultural themes. Symbolism and irony emphasize the tensions between progress and potential risks. Additionally, they highlight public concerns about AI's impact on creativity, knowledge, and ethics. Moreover, these strategies underscore the tension between AI technological advancement and the preservation of human culture, ethics, and cognitive autonomy.

In conclusion, the findings reveal that visual metaphors play a crucial role in how the viewers understand and interpret AI. The cartoonists not only capture the essence of current debates surrounding AI but also offer a platform for reflecting on ethical concerns. The employment of visual metaphors and discursive strategies allows the cartoonists to portray to viewers their societal anxieties and hopes about AI technology.

Author Contributions

S.M.H wrote original draft, did the analysis, and revised the paper. Also, she has read and agreed to the published version of manuscript.

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Conflicts of Interest

The author declares no conflict of interest.

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