Generative Artificial Intelligence and Prompting: Utilizing Existing Artworks for Educational Purposes

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This paper explores Generative Artificial Intelligence (GAI), whose popularity among users has notably increased with the emergence of the user-friendly chatbot ChatGPT-3.5 intended for generating text in late 2022. The paper first briefly discusses the previous research related to GAI, especially its implementation in the educational context, after which the focus is shifted on the characteristics of GAI models for generating images, and the specifics related to providing textual instructions to such tools for the purpose of generating visual content. Such prompting is compared with some examples of textual descriptions of images that existed before Web 3.0 (certificates of Sol LeWitt, art-educational method of observation and the analysis following a description of an artwork, ekphrasis). Additionally, the work engages in simple qualitative research on some of the possibilities of applying such GAI models in an educational context through examples of prompting, inspired by one figurative and one abstract painting.

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GENERATIVNA UMETNA INTELIGENCA IN PISANJE POZIVOV: UPORABA OBSTOJEČIH UMETNIŠKIH DEL ZA UPORABO V VZGOJNO-IZOBRAŽEVALNEM KONTEKSTU

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Ključne besede:
GAI modeli za generiranje slik,
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Ta naloga se ukvarja z generativno umetno inteligenco (GAI), katere priljubljenost med uporabniki je posebej narasla z pojavom uporabnikom prijaznega klepetalnega robota ChatGPT-3.5 za generiranje besedila ob koncu leta 2022. Uvodoma se posvetimo kratkemu pregledu obstoječih raziskav na področju GAI, predvsem tistih, ki obravnavajo uporabo GAI v vzgojno-izobraževalnem okolju. Pozornost se nato usmerja na značilnosti GAI modelov za generiranje slik in specifičnosti, ki so povezane z izdajanjem tekstualnih navodil za orodja za generiranje vizualnih vsebin. Takšen *prompting* se primerja z nekaterimi primeri tekstualnih opisov slik, ki so obstajale pred različico Web 3.0 (certifikati Sola LeWitta, likovno-pedagoška metoda opazovanja in analiziranja na podlagi predhodnega opisa umetniškega dela, ekfraza) in se izvaja preprosta kvalitativna raziskava, v kateri se na primeru *promptinga*, spodbujenega z eno figurativno in eno abstraktno sliko, raziskujejo nekatere možnosti uporabe takih GAI modelov v vzgojno-izobraževalnem kontekstu.

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1 Introduction

The field of artificial intelligence (AI) has experienced highs and lows over the past seven decades, dubbed by Toosi et al. (2021) as its "summers" and "winters". They particularly highlight the 1940s and 1950s as an intriguing period marked by significant artistic ideas (Isaac Asimov's "I, Robot") and scientific achievements (studies by Alan Turing). These prehistoric events, as they date them, preceded the actual articulation of the concept, which was coined in 1956, marking the beginning of the first summer of AI. From then until 2021, they outline the unfolding of decades and their interest in intelligent machines, ultimately heralding their promising future. This future did indeed unfold, as AI has experienced a surge in popularity in recent years, with the field of Generative Artificial Intelligence (GAI) particularly experiencing significant growth (García-Peñalvo & Vázquez-Ingelmo, in press).

Regarding said expression, García-Peñalvo and Vázquez-Ingelmo (in press) caution that not every AI capable of generating something automatically qualifies as GAI. GAI refers to models capable of producing new, previously unseen information based on the data on which they were trained. The content they generate is not just numerical and tied to internal rules but resembles content created by humans and can be further utilized. This often makes it challenging to distinguish between creations of GAI models and human creations, which is why Feuerriegel et al. (2023) attribute to it the potential for transforming fields and industries relying on creativity, innovation, and knowledge processing. The outlines of these predictions are likely anchored in the events of 2023, which was characterized by the widespread experimentation with ChatGPT, a highly accessible text-generating chatbot, whose 3.5 version was introduced by OpenAI in November 2022 (Jauhiainen & Guerra, 2023).

Interestingly, the revolution was instigated by ChatGPT-3.5 which serves as a text generator, as opposed to image-generating models that already existed at the time, such as OpenAI's DALL-E and *Midjourney*, as noted by García-Peñalvo (2023). Nevertheless, the capabilities of ChatGPT, quickly recognized by users (exceeding over a hundred million active users by January 2023 (Hu, 2023)), evidently popularized other types of tools that soon began emerging on a weekly basis, providing users with endless possibilities for generating text, images, music, etc., in

a straightforward manner, provided the user has internet access and possesses a computer or smartphone (Jauhiainen & Guerra, 2023).

Considering that the users tend to be children and young people in great part, it is to be assumed (and is already happening) that GAI will impact formal education systems, thus making it a topic of numerous research studies. Its advantages, as outlined by Jauhiainen and Guerra (2023), include accessibility and user-friendliness, rendering it adaptable for implementation in this domain and for integration with other educational innovations, such as digitization and gamification. Focusing on higher education in their work, Chan and Wenjie (2023) highlight several of its merits. While they view text-generating tools as tangible aids in writing papers and evaluating written work, supported by an extensive array of references, they briefly touch on GAI image generators, considering them valuable tools for developing skills in the fields of art and design. This current emphasis on text generators in research related to the educational context has also been noted by Lee et al. (2023), who wrote that, in comparison, image generators tend to be relatively underutilized despite their advantages, especially when considered in the context of STEAM.

Of course, the implementation of GAI in educational systems, whether involving text generators, image generators, or other content, should not be hasty. Aside from the advantages, there are also significant drawbacks. That's why Relmasira et al. (2023) emphasized the need to develop AI literacy. In their work, they considered two descriptions of such literacy found in papers published in recent years, highlighting Touretzky et al.'s (2019) characterization. According to them, AI literacy encompasses not only understanding basic AI concepts and the ability to interact with AI technologies but also awareness of AI's impacts on society. In the case of GAI, this impact is directly related to its functioning, as it depends on the quality of the data on which its models are trained, as discussed by Feuerriegel et al. (2023). According to them, the problems associated with GAI are as follows: incorrect outputs, issues related to bias and fairness, and copyright violations. They also added environmental concerns as an important point due to such systems consuming large amounts of electrical energy. Cress and Kimmerle (2023) in their research on ChatGPT highlighted that GAI currently lacks any conceptual knowledge. This has been further demonstrated by Daher et al.'s (2023) study, also related to ChatGPT, in which they concluded that the limitations of this tool became more apparent when

"a high level of depth and critical thinking" is demanded from it (Conclusions, para. 6).

The enumerated deficiencies exert an impact on users in a way that, during interactions with GAI, they try to adapt to its characteristics. This is reflected in an increased focus on prompts, prompting, and prompt engineering. Prompts are simple textual instructions that users provide to its models (or the tools relying on its models) in natural language to generate desired content. The process of giving such instructions could be described as prompting. Since prompting doesn't always result in the generation of desired outcomes, users are led to continuously modify prompts to approach the desired results. This form of GAI interaction, essentially grounded in a trial-and-error paradigm, has catalysed the evolution of prompt engineering. Concerning text generation models, Giray (2023) delineates prompt engineering as a nascent discipline intricately connected with the refinement and optimization of prompts to enhance the efficacy of large language models (LLMs), such as GPT. This is particularly pertinent when composing instructions in natural language, the input for these prompts. When it comes to image generation models, the situation is quite complex because prompt engineering in this context needs to consider the transition from text as one medium to an image as another. Feng et al. (2023) describe it as an iterative activity where users experiment with diverse linguistic expressions to achieve their desired outcomes, a task that may demand a substantial temporal investment.

Given that the formulation of prompts has emerged as a pivotal competency in the interaction with GAI, as underscored by Lee et al. (2023), it is imperative to accord it due consideration. Within the realm of the arts, encompassing not only visual arts but also art pedagogy and literature, prompt engineering assumes notable significance as it affords opportunities for integrating GAI with certain artistic forms and methodologies that predate the advent of Web 3.0. As for visual arts, it is sufficient to mention the eminent conceptual artist of the 20th century, Sol LeWitt, who was renowned for his instructions, conveyed textually and occasionally delineated in the form of succinct sketches, which serve as instructions for the execution of wall drawings by others. His instructions are composed of visual-formal descriptions, often including descriptions of art materials, as is the case with his Wall Drawing #786A from 1995, which is presented in the form of a certificate, another one of his peculiarities, in the work of Kohen and Theodore (2013):

> "(…) A 36° (90 cm) grid covering the wall. All two-part combinations of arcs from corners to sides. Black pencil grid, white crayon lines, black wall (…)." (p. 105)

In light of its structural resemblance to many of his other directives, such instructions can easily be perceived as stimuli for the recreation of the wall drawings to which they pertain. It is noteworthy that GAI enthusiasts have identified these instructions as prompts, as extensively documented on the internet (see Goodchild, 2023; Woo, 2022). However, it is essential to underscore that prior to GAI enthusiasts, art teachers and museum educators had already embraced said instructions. They often incorporate LeWitt's certificates into their artistic activities with children and youth, irrespective of the capabilities of GAI. This is evident from numerous accounts of classroom sessions and museum pedagogical activities available online (see Gaw, 2016; Kunstmuseum Basel, 2020).

In the realm of art education, an intriguing method occasionally employed in schools is described by Petrač (2015) as the method of observation and analysis following a prior description of an artwork. This method, akin to *analogical prompting* from a GAI perspective, involves a teacher or student verbally describing an image, while others are tasked with imagining and subsequently creating their own visual works based on that description. The surprise effect is anticipated when the described image is revealed. Having successfully employed this method multiple times in my own teaching practice with elementary school students and university students in teacher education and witnessing its utilization by students under my mentorship in their research endeavours (for example, see Vrkić, 2023), I feel confident in asserting that this method is intriguing not only due to the aforementioned surprise element but also for various other reasons.

In such a structured activity, students tasked with describing an artwork are encouraged to articulate in detail what they observe in the image. Those engaged in creating their own visual works based on the description are prompted to visualize the spoken or written description in a rich and detailed manner. Simultaneously, all participants in such an activity are directed toward composition as the fundamental structure of the image. Here, the primary reference is to basic categories such as orientation (vertical, horizontal, diagonal), relationships on the plane (centre, left, right, up, down), in space (in front of, behind, within, outside), and proportional relationships (smaller, larger, equal). These mentioned landmarks, particularly in the

context of primary education, align with essential curriculum outcomes across various school subjects in Croatia (*Kurikulum za nastavni predmet Likovne kulture za osnovne škole i Likovne umjetnosti za gimnazije u Republici Hrvatskoj* (LK), 2019; *Kurikulum za nastavni predmet Matematike za osnovne škole i gimnazije u Republici Hrvatskoj*, 2019; *Kurikulum za nastavni predmet Prirode i društva za osnovne škole u Republici Hrvatskoj*, 2019). The same curriculum outcomes are highlighted in this method during the final comparison of students' visual works with the artwork that served as the basis for their creation, emphasizing the significance of these outcomes.

Literature possesses its ancient tools for vivid description, among which ekphrasis stands out. Described under the same heading in the Croatian Encyclopaedia, ekphrasis is characterized as a method of description that, in a broader sense, refers to any discourse aimed at vividly presenting a given topic, while in a narrower sense, it is confined to the description of artistic works and artifacts. One of the early examples of ekphrasis is found in Homer's Iliad, where Tarlton (2015) highlights the description of Achilles' shield, commenting on it as tangible despite being never seen. Nevertheless, as noted subsequently, the objective of ekphrasis is not in providing a perfect verbal depiction of an image; rather, its aim is to offer the reader a specific ekphrastic experience. This concept is elegantly encapsulated in the analysis of two poems by poets of the New York School by Davidson (1983):

"In order to render the instability of this artifact, the poet becomes a reader of the painter's activity of signifying. This act of reading is never passive, never recuperative since its function is to produce a new text, not to re-capture the original in another medium. The poet who reads another work of art transforms his hermeneutic into performance, just as the reader of the poem participates among the various codes of the text to generate his own readings." (p. 77)

Therefore, the transformation occurring in the transition from one medium (image) to another (text) and vice versa is by no means straightforward. With each transition, a portion of the existing elements is reduced, giving rise to new layers. This phenomenon, indeed, transpires even when remaining within the same medium, as every act of reception implies a redefinition. Davidson (1983) discussed the distinctions between what is written by the poet and what is read by the reader; such distinctions are evident between what is painted by the artist and what is perceived by the observer. Drawing upon the power of visual language, Damjanov (1991), for

instance, posited that an observer, when activating a profound level of perception during observation, possesses the ability to both perceive and create through his gaze.

Although not inherently designed for prompting, ekphrasis may align particularly well with GAI, as it allows for an extensive elaboration of motifs, granting GAI the choice of how to structure the composition. In this process, GAI autonomously generates the composition, drawing upon the wealth of data in its training arsenal. The results are generally impressive, as observed in the case of prompting John Keats's famous poem "Ode on a Grecian Urn" (Figure 1), which was initially considered for research in the preparatory phase but ultimately discarded for the very reason that it seemed too predictable for GAI. Unlike such an approach, the instructions of Sol LeWitt and the method of observation and analysis after the prior description of an artwork genuinely demand an analytical behaviour from GAI – not concerning motifs, but rather the visual language that encompasses elements such as lines, colours, shapes, and basic compositional relationships. Regarding Sol LeWitt's instructions, in the artist's blogs and similar sources, their prompting has ventured into uncharted territories, making them suitable for further experimentation. The subsequent research is dedicated to exploring this alternative method, well-known in art education.

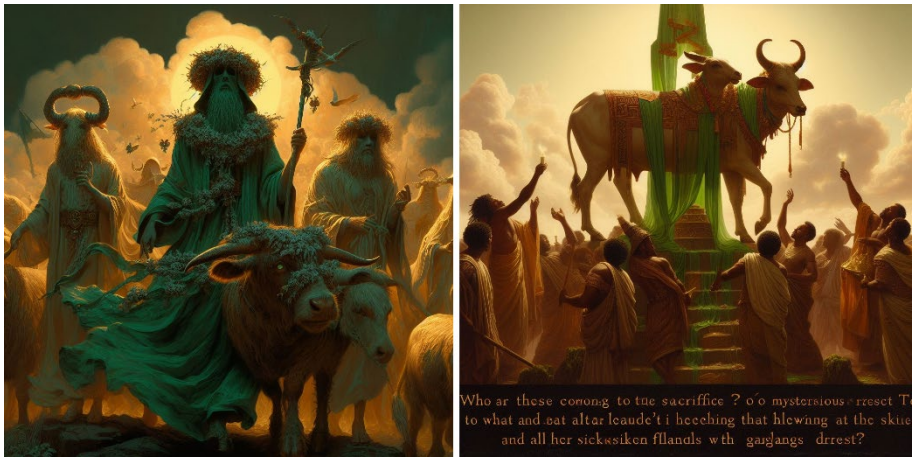


Figure 1. Two out of four images generated from the same prompt (*Who are these coming to the sacrifice? To what green altar, O mysterious priest, Lead'st thou that heifer lowing at the skies, And all her silken flanks with garlands drest?*) using AI (in *Bing Image Creator*) on November 20, 2023, at 10:10 a.m.

The prompt is taken from John Keats's poem "Ode on a Grecian Urn" from 1819, specifically from one part of the poem (4th stanza, 1st to 4th lines), retrieved from Wikipedia ("Ode on a Grecian Urn," 2023), with minimal modifications (spacing). From the generated images, it is evident that the motifs are recognized, with GAI arranging them according to its preferences, likely aiming to achieve a strong visual impression. The symmetrical composition is a conservative choice that consistently results in a balanced composition, and the psychologically impactful complementary colour contrast, ranging from blue to green on one side and from orange to red on the other, is also utilized. Hollywood often employs this contrast as a template, notably in films by Michael Bay, but Arnheim (1969) wrote about this contrast long before, drawing on observations made even earlier, by Goethe. Regarding the generated image shown on the right, another aspect is noticeable: the need for visual formatting of the text, creating an overall presentation akin to a form of illustration. It can be assumed (but only as a hypothesis) that this occurs when GAI recognizes in the prompt a refined language that is itself an art form, treating it as an image.

2 Description and Aim of the Research

The research uses simple descriptions of selected artworks (one figurative and one abstract painting) as default prompts for selected GAI image generation tools. These descriptions in the research are shaped in such a way that they resemble the answers that are usually obtained in teaching practice to the initial question *What do you see?* when observing a work of art. The same method of description is used in the method of observation and analysis after the previous description of the work of art.

The goals are to explore the possibilities of accessible GAI tools when it comes to generating existing images and, based on that, to propose some possibilities of using such prompting in an educational context.

Research Questions

1. Do the generated images contain the elements given in the prompts?
2. Do the generated images reflect the relationships described in the prompts?
3. Are there significant differences related to the first two questions, regarding prompting descriptions of figurative and abstract paintings?

4. Roughly, how much time during the research was devoted to adjusting the prompts in order to obtain the best possible results?
5. In what way could GAI prompting of existing images be used in an educational context?

2.1 Method

As a qualitative study, the intention of the research was to explore the described topic in terms of its application in the educational context, aligning with the typical practices of teachers who, to varying extents, engage in such exploration when crafting lesson plans. In line with this, I, the teacher, am the sole participant in this research, essentially reflecting my lesson preparation related to considering the introduction of GAI as new educational content. Formally speaking, the research includes:

1. Selection of suitable GAI tools and artworks for image generation.
2. Description of the prompting process.
3. Presentation and interpretation of the results.

2.2 Selection of Suitable GAI Tools and Artworks for Image Generation

While the internet offers a variety of tools for image generation, in the preparatory phase of the research, only two such tools were ultimately chosen from the initially selected five (*Bing Image Creator*, Canva's *Magic Media*, *Gencraft*, *Craiyon*, *Runway*) for experimentation. The selected tools are *Bing Image Creator* by Microsoft, which currently relies on OpenAI's DALL-E 3 model, and *Runway*, a tool from the company of the same name, whose researcher Patrick Esser participated in the implementation of *Stable Diffusion* (Jennings, 2022), a different GAI model for image generation often mentioned alongside DALL-E and *Midjourney*. Both tools are available for use on the internet, have limited but quite usable free versions, and can be utilized on both computers and smartphones. Additionally, in their terms of use, which are quite complex for both tools and should be thoroughly read, it is essentially stated that Microsoft and Runway AI do not claim ownership rights over prompts and generated images. However, users also cannot protect them through copyright (Bing Image Creator, August 4, 2023; Runway, September 5, 2023).

For the research, two well-known paintings were selected—one figurative, *Woman with a Parasol - Madame Monet and Her Son* (1875) by Claude Monet, housed in the National Gallery of Art in Washington (n.d.), and one abstract, *Composition with Yellow, Blue, Black and Light Blue* (1924) by Piet Mondrian, located in the Yale University Art Gallery (n.d.). These paintings were chosen for the formulation of prompts and subsequent generation of new images for several reasons. First and foremost, content-wise, most people have a relatively clear conception of both, or at least recognizable painting styles associated with Monet (impressionism) and Mondrian (De Stijl, neoplasticism, geometric abstraction). The second reason is that the compositions of both paintings elicit descriptions that inevitably involve the need to describe position, relationships on the plane and in space, proportional relationships, etc. – content found in the curriculum outcomes for various school subjects in Croatia, as previously mentioned in the text. In describing Mondrian's abstract painting there is also a stronger need to express concepts within the categories of visual language, which is an important part of the curriculum outcomes for Art Education (LK, 2019). Regarding copyright, these paintings were selected because both institutions housing them, as indicated in their respective online collections, have labelled them as being in the public domain under the CC0 designation. While not crucial for prompting itself, this information may become relevant if the generated images closely resemble the originals, especially for the presentation of such results.

2.3 Description of the Prompting Process

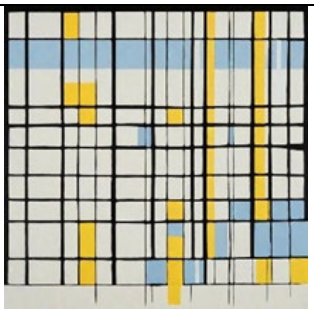
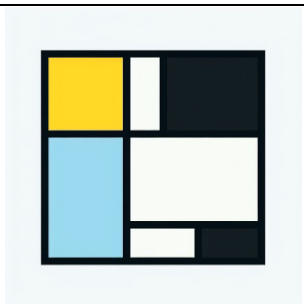
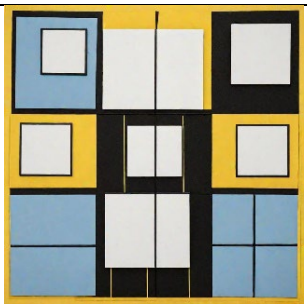
The prompting process unfolded in two phases. In the first phase, initial prompts were formulated based on selected artworks. They were originally written in Croatian, then translated into English using *Google Translate*, and finally edited using the free version of *Grammarly*. The second phase commenced with the analysis of existing results (prompts and generated images), followed by the modification of prompts. The subsequent presentation of results arguably includes the first outcomes of high-quality (relatively speaking) obtained in this manner during the first and second phases, particularly when viewed in relation to the first two research questions.

2.4 Results and Interpretation

Table 1: Display of results (prompting Monet's painting)

		Bing Image Creator	*Runway*
Phase 1	Prompt	In the middle of the meadow, a woman is shown in semi-profile, from the bottom angle. She is dressed in a light blue long dress. Her hair is only a little bit visible under a small hat. She holds a small opened umbrella in her right hand. In the background on the left is a boy. He is also standing, shown en-face. He is dressed in a sailor's suit and has a straw hat on his head. In the distance is a blue sky with tiny white clouds. It looks windy.	
	Generated image	 One of four images generated from the same prompt using AI on November 14, 2023, at 3:13 p.m.	 One of four images generated from the same prompt using AI on November 14, 2023, at ca. 3:21 p.m.
	Time	Ca. one hour	
Phase 2	Prompt	A woman stands in the middle of a meadow full of wildflowers. She is shown almost frontally and dressed in a light blue outfit in the style of the second half of the 19th century. In her right hand, she holds an open green umbrella. To her right, a bit further, stands a boy in high grass. He is shown frontally and dressed in a white shirt. He has a hat on his head. The weather is clear, with small white clouds and windy.	
	Generated image	 One of four images generated from the same prompt using AI on November 16, 2023, at 4:44 p.m.	 One of four images generated from the same prompt using AI on November 16, 2023, at ca. 4:50 p.m.
	Time	Ca. one hour	

Table 2: Display of results (prompting Mondrian's painting)

		Bing Image Creator	*Runway*
Phase 1	Prompt	The square divided by a vertical black line in its left part and a horizontal black line in its lower part into four fields. The top left rectangual field further divided into a yellow and a white square. The bottom left blue square field. The bottom right rectangual field further divided into a large white and a narrow black rectangle. The top right pale blue field occupies the largest part of the painting, looks like a rectangle that tends to be a square.	
	Generated image	 One of four images generated from the same prompt using AI on November 18, 2023, at 8:58 a.m.	 One of four images generated from the same prompt using AI on November 18, 2023, at ca. 9:00 a.m.
	Time	For the research, another Mondrian painting was initially chosen (*Lozenge Composition with Yellow, Black, Blue, Red, and Gray* (1921)), which is labeled as CC0 and is part of the online collection of the Art Institute of Chicago (n.d.). The description of the painting was unsuccessfully prompted on multiple occasions over several days. Subsequently, this simpler Mondrian composition was selected as an alternative. The prompting process took less than an hour.	
Phase 2	Prompt	A square divided by black lines into six squares and rectangles. From the top left to the bottom left: a yellow square, a white square, a blue square. From the top right to the bottom right: a large light blue square, a rectangle further divided into a white and a narrow black one.	
	Generated image	 One of four images generated from the same prompt using AI on November 18, 2023, at 9:34 a.m.	 One of four images generated from the same prompt using AI on November 18, 2023, at ca. 9:36 a.m.
	Ti	Ca. half an hour	

In the prompting initiated by Monet's painting (Table 1), generated images in both phases encompass all elements specified in the prompts. However, in two images, an additional background motif of the woods emerged that was not initially prescribed. Recognizing relationships posed certain difficulties during the prompting process, despite not being evident in the results. In both the first and second phases, challenges often arose concerning the failure to recognize a clear left-right relationship with both tools. However, both tools consistently identified the in-front/behind relationship (center of the image/in the background). The final results from both tools align with the prompts. Concerning the outcomes, attention should be directed to inadvertently written incorrect information in the initial prompt (*sailor's suit, straw hat*), which went unnoticed until the analysis at the beginning of the second phase. Additionally, *Runway*'s recognition of a specific image in the second phase suggests that the *umbrella* in combination with a *light blue outfit in the style of the second half of the 19th century* played a significant role.

Although dealing with a fundamental visual language, prompting inspired by Mondrian (Table 2) proved to be much more challenging (see the *Time* row in Table 2). Nonetheless, both tools generated images containing all elements specified in the prompts. *Runway*, for instance, seemingly recognized them as a pattern for multiplication rather than a finished composition. Regarding relationships, generated images exhibit both vertical and horizontal compositional directions as specified in the prompts. However, there were significant difficulties in left-right and up-down relationships, as evidenced in the results. Finally, it is worth noting that the image generated in *Bing Image Creator* closely approximated the prompt, and throughout the prompting process, this tool demonstrated closer adherence to the prompts it was given.

3 Discussion and Conclusion

Within the scope of this research, and without drawing general conclusions (for (G)AI is designed to continuously learn), it is evident that considerably more challenges emerged in prompting inspired by Mondrian's abstract composition. In this case, the focus was not on referencing figurative motifs but rather on expressing concepts in the categories of visual language. In contrast, prompting inspired by Monet's figurative painting encountered issues only when referring to relationships on the plane (left-right). This is intriguing, particularly considering that problems

with spatial relationships, which are illusory in a two-dimensional representation, did not arise with Monet.

Mondrian proved to be more demanding in a temporal sense, especially considering that his initially chosen painting for the research was abandoned in favour of an alternative. Nevertheless, the extended time spent in prompting his paintings and the overall time invested in the research, from the initial selection of tools onward, can hardly be described as wasted. It is more about the time dedicated to interacting with GAI, which possesses not just one, but as many different ways of thinking as there are models and tools. Accordingly, the possibilities of GAI tools for image generation in this manner, particularly in an educational context, can be immeasurable.

Prompting existing images allows students to see their own mistakes, which are common when superficially perceiving an artwork (especially in the case of figurative paintings), as was the case in this research with Monet's painting. In the case of abstract paintings, such prompting serves to train their expressive potential in relation to the actual visual content of the artwork, not based on motifs but on visual language. Furthermore, such prompting can stimulate a broader discussion about how GAI "thinks", and about the relationship between the training of a particular model and its ability to recognize prompts. In this context, a crucial question that arises is why GAI tools for image generation find it easier to recognize the motif of a woman dressed in the style of the second half of the 19th century with an open umbrella in her hand than a composition of several squares and rectangles arranged on the plane in basic left-right, up-down relationships. When all of the above is integrated, along with the imperative of translation from Croatian to English, and the errors that may arise, thus influencing the final visual results, the prompting described in this study can develop competencies in students that go beyond the ability of visual perception. Finally, the possibilities of GAI for image generation seem to go hand in hand with questions related to copyright and content appropriateness, and pointing out this aspect to students is also potentially very useful.

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