Journal of Business Administration Online

Fall 2025, Vol. 19 No. 2

Leveraging AI for Visual Content in Academic Research

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ABSTRACT

Artificial intelligence (AI) has become a part of our daily personal and professional lives. For business professionals, visual content plays a critical role in communicating product, brand, and promotional messages, yet producing high-quality images through traditional methods is often time-consuming, costly, and requires specialized skills. Academic researchers, in particular, face constraints of limited budgets, short timelines, and the challenge of finding appropriate and realistic content to be utilized in research settings.

Stock images offer some solutions but often fail to meet the specific needs of experimental designs. Many available stock images are too generic or are inconsistent with the visual requirements for the research topic. AI-generated images address this gap by enabling rapid, cost-effective creation of customized, high-quality visuals without requiring advanced technical expertise. These tools expand creative possibilities for researchers, allowing them to design tailored stimuli for experiments to enhance the realism of research scenarios. As a result, AI image generation has the potential to significantly transform academic research and higher education.

This work examines current research about the perception and usefulness of AI-generated versus human-created images, specifically for academic and research purposes. It also outlines the advantages and limitations of AI image generation, reviews the leading AI software applications, and presents examples of AI-generated images developed for business research experiments along with the prompts that produced them. By highlighting the practical and academic applications, this study underscores the value of AI image generation as a versatile and transformative tool for academic research and education.

Keywords: artificial intelligence (AI), marketing research, experimental design, content creation, faculty productivity

INTRODUCTION

With the advancement of technology, artificial intelligence (AI) has become part of many aspects of daily life. The ability of AI to generate images expands its usage to a different level for business professionals. Visual content is essential for marketing where images are used to communicate about products, companies, and promotions. For experimental research, the challenge is always how to create an experience as close to

"the real world" as possible while allowing the researcher to manipulate the independent variable(s) to test different treatments (Mead et al., 2020). Generally, this visual content is created manually by humans using photography, video production, or graphic design. These methods are very time-consuming and costly for an academic researcher. Most who need images for research are constrained by small budgets and short deadlines which is magnified for those without the relevant skill sets. As with many creative endeavors, the smaller the budget and shorter the deadline, the lower the quality tends to be for visual content output.

While stock images are available for purchase online and through many software packages, there are many instances where the exact image needed for the experiment does not exist. Recent advances in AI are transforming visual content creation, both lowering the production cost and time, thus allowing researchers who are not experts at photography, video production, or graphic design to generate high quality images for marketing research and other academic purposes (Reisenbichler, 2022; Rogers, et al., 2024). With the increasing interest in AI usage, content generation via AI software will be a valuable skill set for educators and the future business professionals who they instruct (Aktay, 2022). In the next sections, we will examine the current research on the perception and usefulness of AI generated images compared to human created images along with academic use of AI generated images. Following the literature review, we explore the pros and cons of AI image generation in academic and research settings followed by an overview of the popular software applications which have AI content generation capability. After those discussions, we share examples of AI created images for a marketing research experiment and the prompts which generated them. We conclude with a section covering practical AI image generation for the classroom.

LITERATURE REVIEW

Existing research has examined people's perceptions of AI generated images with results generally showing a positive influence of AI generated images on people's attitudes (Lu et al., 2023; Techapongsatorn & Waikongkha, 2025; Zhang et al., 2025). With AI generated images becoming as realistic as human created imagery, it may be challenging for some people to tell the difference between them. Lu et al. (2025) found those in the study sometimes struggled to differentiate AI generated images from real images with a misjudgment rate of 38.7%. A research study conducted in Thailand with Gen Z participants found that they generally had a positive attitude toward AI generated images even though they could moderately distinguish between those images and human created images (Techapongsatorn & Waikongkha, 2025). The results from this research further indicate that people who have engineering, technology, and science backgrounds have a more positive attitude toward AI generated images than those from other disciplines. Thus, it may be that younger generations with technology and science interests in general are more accepting of AI imagery. Niculae's (2023) research echoes these results that younger people are generally more accepting of AI technology with most study participants preferring the AI generated images.

AI generated images excelled at quality, realism, aesthetics, creativity, artistic and some personality traits when participants evaluated pictures of human faces

(Göring et al., 2023; Hartmann et al., 2025; Salminen et al., 2022). Results from a study comparing 2,400 human created images and 10,320 AI generated images reveal that AI generated images were rated better for quality, realism, and aesthetics. These results are contrary to the commonly held perception that AI generated pictures are not very realistic. This is however aligned with findings from other literature that shows it is difficult to distinguish between AI generated images and human created images (Lu et al. 2023; Techapongsatorn & Waikongkha, 2025). In addition, AI generated images have been rated better in creativity (Göring et al., 2023; Roose, 2022). In Göring et al.'s (2023) research, AI generated banner ads were compared with those created by commissioned human freelancers and found that AI generated images can achieve up to a 50% higher click-through rate. Even AI generated images for account profiles are rated the same as images of real people for certain personality attributes such as authenticity, clarity, and empathy (Salminen et al., 2022).

Because AI generated images are evaluated as the same or better than human created images, both business and higher education professionals are adopting AI generated images into research and classroom usage (Arslan & Ghazal, 2024; Huston & Kaminski, 2023; Rogers et al., 2024; Ruci et al., 2025). AI generated images can help enhance faculty productivity in their teaching and research (Rogers et al., 2024). AI images can help learners visualize abstract concepts into a more concrete form, thus making teaching more effective (Aktay, 2022). In one medical school, AI technology has been used to generate artwork to train future doctors for specific doctor-patient situations to avoid the use of actual patient images that would violate HIPAA regulations (Huston & Kaminski, 2023).

In addition to using AI to generate images for marketing research, faculty can use AI technology for other tasks such as creating images for classroom use and professional presentations. Faculty can combine the presentation layout feature in Canva and PowerPoint with custom images perfectly tailored for the presentation topic. This allows for more creativity with the only limitation being how well the user prompts the software (Rogers et al., 2024). Faculty also need to model appropriate use of AI technology for future professionals. Because AI technology is easily accessed during class, faculty can create and revise prompts with student input to demonstrate how to appropriately use the technology and how those prompt revisions result in better images for an intended purpose. For example, if a case used in the classroom focuses on testing consumer purchase intentions based on interactions with salespeople of differing ethnic backgrounds, the professor could modify the AI generated images using student input to improve the prompts. Additionally, documenting how an image was created is important for students to understand as laws will evolve regarding informing consumers about the use of AI images for marketing and organizational purposes.

Learning how to use AI technology to generate images is valuable for higher education professionals. Although there is research investigating the perceptions and application of AI generated images, no studies provide a comprehensive review and explanation of different AI image generation software that is available. Having such research is crucial for those new to this technology as the quality of the AI generated

images highly depends on proper software use. Thus, this research attempts to close this gap by offering arguments for and against using AI and providing a comprehensive review of different software which can be used to generate images. The next section covers the advantages and disadvantages of AI for generating images.

While not the focus for this paper, there are also many legal questions that have not been answered about ownership of newly generated AI images. Since there is not a human creator of the images, there is a legal argument that no copyright protection exists; other legal arguments would transfer ownership to the user, the software owner, or possibly joint ownership between those two entities.

ADVANTAGES AND DISADVANTAGES OF AI FOR IMAGE GENERATION

The major advantages of using AI to generate images for academic research are the ability to: customize content for research requirements, generate content and images easily, and produce content very quickly (Haleem et al., 2022; Salminen et al., 2020). If a researcher is interested in testing consumer purchase intentions based on viewing website images of models with various body types, in our experience, it is unlikely that stock images would exist to cover all of the differing visual images needed. If such images existed, the time and effort to locate those images would be not only time consuming but also likely come at a high cost to the researcher. There is also the opportunity cost involved – time spent searching through thousands of stock images could be used more productively conducting additional research, writing up results, or fulfilling other academic duties. After mastering how to craft relevant prompts, in a matter of minutes, visual images of salespeople by gender, race, body type, or any other characteristic can be generated and refined using AI software applications (Harmann et al., 2024; Kietzmann et al., 2018). AI software has the capability to create a virtually limitless number of visual images, only bound by the creativity of the researcher's requests and prompt writing skills. Given that many software packages with AI integration are free or priced reasonably, this is a very budget friendly option for researchers on a tight budget.

The major disadvantages of AI usage for image generation are the: lack of realism in many images, potential bias that can exist in the data sets used by the AI software, and need to learn how to prompt the software for desired results (Zhang et al., 2024). While AI generated images of objects and places tend to be a more accurate representation of the real world, the AI generated images of people often look artificial or distorted. It is not unusual for AI generated images of people to have eyes that look strange, too many fingers on their hands, or other physical characteristics that mark them as AI images versus images of real people. The software is also restrained by the data sets of existing images it uses to generate the new AI images – the better the data sets the better the images. If there is a bias in the data set, that bias will be translated into the images as well. For example, if a certain demographic or ethnic group is over-represented in the data set, then the results would favor that market segment versus other segments. Furthermore, as a counterpoint to the discussion of time savings of AI software, researchers must learn how to use the AI software and how to effectively write

prompts to generate the visual content needed for their experiments (Cillo & Rubera, 2025; Kun et al., 2024).

MAJOR SOFTWARE PACKAGES FOR AI IMAGE GENERATION

While there are multitudes of software packages on the market which possess the capability to generate AI images, this paper will concentrate on the most well-known packages, focusing on features and cost. The software below is listed in order from ease of use (Canva) to more challenging to use (MidJourney).

(1) **Canva** is familiar to academic users since this software is used by many faculty for creating presentations and class content. It does contain an image generator but is limited by the number of images that can be generated per month. There are free and professional versions, with the professional version offering more capability and datasets than the free version.

(2) **Open AI's DALL-E** is the image generator created by the company behind Chat-GPT. It offers both a free and premium version. For unlimited generation of images, a subscription to Chat-GPT plus is required. While DALL-E output is solid, there are other packages with more realistic image generation for comparable cost.

(3) **Microsoft Designer's Image Creator** is free even though it is powered by DALL-E and integrated into Microsoft's AI bot, Copilot. Users do need a Microsoft account, and it is not as fast as DALL-E when generating images.

(4) **Adobe Firefly** is also free but does have limits on the number of images generated per month. Users need an Adobe account; it does generate some of the most realistic visual images. This image accuracy is due to the AI being trained on Adobe's extensive database of stock images.

(5) **Imagen FX** is a Google application that is integrated into Gemini. It is free, but it has limits on number of images generated per month. Imagen 2 did not have the most realistic images of people, but the newer version (Imagen 3) is reported to be much better at generating images of people.

(6) **MidJourney** currently is the best package for generating images and is used by many professional visual designers. There is a monthly subscription for a low cost but increases based on usage and capabilities included.

There are certainly other software packages that can generate AI images, but those listed above are the major players in the industry which are within most academic budgets and, in many cases, are partnered or integrated with well-known software brands (Canva, 2024; G2, 2024; Ortiz, 2024; Shankland, 2024). One final caveat regarding the use of software to generate AI images. Each software package has different requirements and restrictions on how images generated with the software can be used. Users need to perform due diligence to ensure that they are not violating the End-User License Agreement (EULA) for each application.

Also, there are several software tools and platforms that can be used to generate descriptions for stock images. While these AI generated results can be useful to marketers for content and search engine optimization (SEO) practices, they can also be

utilized to aid in experimental design when testing hypothesis for differences between AI generated images and human created images. These packages allow researchers to upload a human created image into the software, then the software generates descriptive text researchers can input into the chosen software to generate an AI image based on that descriptive text. While this process is not without error, it does provide a more detailed prompt to generate an image than would normally be written by the researcher. It also removes any unconscious biases that the researcher might bring to the prompt. The CLIPP software interrogator (pharmapsychotic, 2022) is a popular website that is free to use. However, CLIPP can have a varying wait time for results depending upon the number of queries that are "in line" when you initiate a prompt (Hartmann et al., 2025). Adobe Firefly recently introduced a new Structure Reference feature that allows users to input a reference image that it utilizes to generate an AI image with a similar style and layout (Adobe, 2024). Given the fast-paced development in the AI software industry, it is expected that many more useful features will be added to existing software along with new software developments that will be practical for business researchers. For more information about the software mentioned above, please refer to Table 1 in the Appendix.

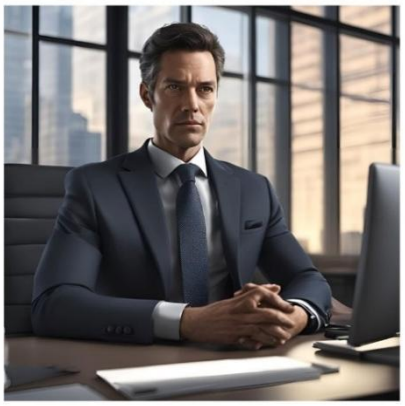
EXAMPLES OF IMAGES CREATED WITH AI

The images below were created with Canva using the prompts shown (Figures 1-4). The success (or failure) of various prompts emphasizes the importance of researchers learning how to craft a prompt that will create the desired image.

In Figure A, the simple prompt resulted in an image of a man with unnatural looking hands with a very stern demeanor which resembles a painting or anime style drawing rather than a photograph.

Figure A

AI prompt: Businessperson in suit



For Figure B, we created a more descriptive and complete prompt resulting in an image that looks like a picture of a real person. The man is smiling and does not have any unusual body parts like we see with the hands in the first image. This image would likely be usable for a research experiment.

Figure B

AI prompt: Realistic businessperson in professional suit that looks credible and likable

Figure C was generated using a simple prompt. When first glancing at the picture, the image appears to be realistic with a smiling female in a professional conference room setting, however, one quickly realizes that the woman in the picture is missing the bottom half of her body, and her torso has been placed on top of the conference room table.

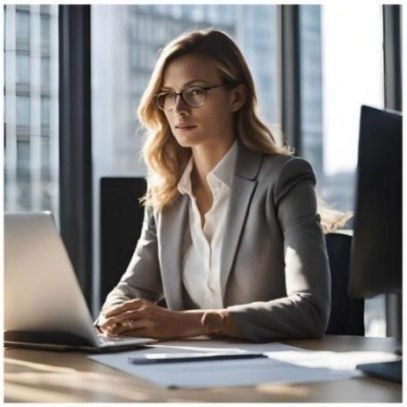
Figure C

AI prompt: Female salesperson

Lastly, we used a more descriptive prompt to generate Figure D. In this image the AI produced a female professional sitting in a traditional office setting who is seated in front of a laptop. The reflections and shadows are not exactly right, but overall, this image would likely be usable for a research study.

Figure D

AI prompt: Realistic female salesperson who is professional



PRACTICAL APPLICATIONS FOR THE CLASSROOM

The skills developed from generating AI images for academic research purposes may also aid in productivity and learning in the classroom. For professors who are teaching experimental design in either marketing research or research methods classes, the demonstration of the professor's experimental design using AI generated images provides a current example for class discussion. This is easily parlayed into a discussion of A/B testing of advertising, brands, or other marketing visuals that can also be AI generated. Classes related to advertising, promotional marketing, brand

management, or social media offer a wide variety of content options in which AI generated images can increase attention and engagement.

For non-marketing faculty, one example could be the creation of personnel scenarios for human resource classes to highlight for students the possibility of unconscious bias in hiring and promotion. The same scenario could be presented to multiple groups in the class with different images or with no image. Students would have to explain whether they would hire or promote the person based on the information and/or image of the candidate. This same process could also be used for experimental designs in human resource research.

Business communications faculty could use AI image generation to illustrate how to create training documents and presentations to show employees from varied backgrounds completing tasks within the organization. In operations management, faculty could generate images of different manufacturing and service settings when relevant images are not available. It could also be used for space planning and layout discussions to improve workflows. In a facilities management course, faculty could use AI images to present different layouts of office or other spaces in a building.

These AI image generation skills will also enable faculty to create customized AI content for conference or classroom presentations when stock images are not sufficient or suitable for a specific topic. This leads to AI not only being a productivity tool in a professor's toolkit, but a means to engage with students and other audiences using current technology.

CONCLUSION

Artificial intelligence has the capability to transform experimental design in academic research, offering many advances in time and cost savings along with flexibility in developing customized visual content. AI allows for experiments to be conducted across larger sample sizes, with more multi-variate and factorial designs, which should result in more accurate and usable consumer insights. The same skills in creating images for research are also useful for faculty who need to create images for the classroom and professional presentations. As with any technological advancement, AI presents new challenges for users which include the learning curve of prompt creation and software usage along with the possibilities of bias and future copyright issues. However, by implementing AI usage in a professional manner, academic researchers can enhance their experimental designs and classroom materials, leading to more useful results from their research and more engaging classroom interactions.

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APPENDIX

Table 1: Software Package Comparison

Software Package	Price Points (single license)	AI Image Generation
Canva Free	Free	50 credits to generate AI images (more complicated queries use more credits)
Canva Pro	$199.99 per year	500 credits to generate AI images and refreshes each month
DALL-E	Free	“Unlimited” but quality and speed slows down considerably as use increases
DALL-E	Part of ChatGPT Plus ($20 per month)	Unlimited with faster speeds and higher quality versus free version
Microsoft’s Image Creator	Free with Microsoft Co-Pilot account	15 “boosts” a day to generate images
Microsoft’s Image Creator Premium	Microsoft Co-Pilot subscription or Office 365 Premium account ($20-$30 per month)	Extensive use clause in software license allows Microsoft to limit or slow usage even in paid versions
Adobe Firefly	Free	25 monthly credits (estimated) to generate AI images
Adobe Firefly	Standard ($10 per month) or Pro ($20 per month)	3000 credits per month for Standard and 4000 credits per month for Pro
Imagen 3	Free with Google login and Image FX or Gemini installed	Daily limits are unknown and can vary
Imagen 3	Part of Google AI Pro plan ($20 per month)	Generate up to 1000 images per day
MidJourney	Depends upon plan chosen ($10-$60 per month)	Higher priced plans offer faster image generation and better resolution

Note: This data is accurate as of October 2025.