



Empowering Creativity through Generative AI in Digital Art Education in Higher Education

Caleb Kicklighter

School of PVFA, Texas A&M University, College Station,
TX, USA
kicklica@tamu.edu

Mayet Andreassen

School of PVFA, Texas A&M University, College Station,
TX, USA
mayeta@tamu.edu

Jinsil Hwaryoung Seo

School of PVFA, Texas A&M University, College Station,
TX, USA
hwaryoung@tamu.edu

Emily Bujnoch

School of PVFA, Texas A&M University, College Station,
TX, USA
ebujnoch@tamu.edu

ABSTRACT

Artificial intelligence is dramatically changing the creative process for many practices. We see this as an opportunity to enrich student projects within our classroom. We created educational materials and conducted an initial study in the Fall of 2023. The study focuses on the impact that image-based generative AI tools could have on the creative process for students in the 3D Animation classroom. We found that, within our class, most students found AI useful for their productivity, but further work was needed to educate students and to create a safe space for students to explore how these tools can enhance their creative work.

CCS CONCEPTS

- **Social and professional topics** → Professional topics; Computing education; Computing education programs.

KEYWORDS

Generative AI, 3D Animation Education, Creativity, Undergraduate Digital Art Education, Iteration, Concept Development

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1 INTRODUCTION

Artificial intelligence (AI) is rapidly becoming an integral part of higher education, permeating various disciplines and proving indispensable in fostering innovation. In the realm of 3D graphics and animation education, AI presents a notable opportunity to revolutionize the creative process. By incorporating AI technologies, educators can streamline tasks, personalize learning experiences,

and provide real-time feedback, thereby empowering students to explore new opportunities in creativity and achieve unprecedented levels of proficiency in their practice. With this trend in mind, a group of faculty members in the Visualization program endeavored to integrate Generative AI (genAI) into the animation studio courses. We identified areas where genAI tools could benefit the students' learning and then coached students on genAI techniques that could enhance their creative process or productivity. This paper outlines our collaborative effort to develop new educational materials focusing on 3D animation and initial studies with students exploring the impact of genAI on learning outcomes and creative methodologies.

2 CURRICULUM DEVELOPMENT

2.1 The Animation Pipeline

Pipeline here refers to the method that groups of students use to organize and complete a short film made of 3D digital content. While "pipeline" differs from studio to studio, they follow a similar basic structure: story and art direction is established in the *Preproduction stage*, then these materials are given to the *Production stage* where the 3D assets are constructed and brought together. The results are rendered out as a sequence of images that are edited together to create the final film. Within this larger process there are smaller review cycles where artists make progress on an asset, seek feedback from a supervisor, and then go back to make changes. This feedback loop is crucial for a team to stick to a united vision and draw forth the best possible version of an asset.

2.2 Needs of the Animation Studio Course

We tailored our experiment towards the needs of our 3D Animation Studio course, which has limitations that were useful to test AI workflow improvements on. First, the projects are on a 15-week timeline, so iteration cycles are short, and students need high volume, fast output. Another limitation is that our program does not have many preproduction courses, which is the stage where the look of a film is established. It follows that students coming into the studio struggle to find an appealing and effective look to their project.

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2.3 AI-Integrated Animation Curriculum

We developed several materials to prepare the students for the new changes. Guidelines were given for how AI could be used in the class: (1) students should use genAI as an iterative and visual communication tool, but not in the creation of their actual assets; (2) they had to purposefully modify results of genAI to use as concepts; (3) they had to document the use of AI within their project for transparency; (4) they were encouraged to review the development background of the tools they chose. We gave lectures introducing several AI-based tools, as well as where in the pipeline they could be implemented. We demonstrated an example for the ideation / iteration process: we plugged a rough artist's sketch into a genAI image generator, prompted style and look changes, discussed the quickly-rendered results, then we refined and repeated. Finally, as part of their final submission at the end of term, students had to present their documentation to the class, including the tools, workflows, and insights they picked up.

3 STUDENTS' EXPERIENCES

3.1 Initial Perception About Using AI in Creative Works

We conducted an optional survey to the animation studio students at the term start. 52 of 52 students responded. We asked whether students found AI to be helpful, and their opinions on AI's relationship to creativity and productivity. The overall impression we found was that: (1)most students were exposed to genAI and saw it as useful; (2)students were generally comfortable with the idea of using AI for simple tasks; (3)students were more critical of using AI in the creative process, citing concerns of how these models are being trained and the impact it has on creative field.

3.2 AI-Integrated Creations

Students used genAI mostly in the way we had expected: visual communication and iteration. Students reported that it let them iterate faster, though the results required cleaning up to produce acceptable results. Students also reported using AI tools to: design characters, create concept art, generate story beats, test lighting ideas, texturing images, generate meshes using photogrammetry, write scripts for Houdini, and to curate resources from the web. Commonly cited tools include Photoshop's generative fill, Firefly, Substance Sampler, ChatGPT, and genAI services (DALL-E, Mid-journey, Stable Diffusion).

3.3 Post-class Feedback

Students were surveyed at the end of the course (42 responses), asking what tools they used and if their opinions of AI had changed. Students were still generally comfortable with using AI to support rote or mundane tasks: 52% were comfortable, 12% indifferent, 36% were uncomfortable. Students were comparatively less comfortable about the use of AI for creative tasks, with 19% saying they were comfortable, 26% indifferent, 55% uncomfortable. Student favorability for AI in for both task-types dropped roughly 10% from the beginning of the semester. AI tools were generally seen as helpful at some point in the process (66.7% positive), with many noting their effectiveness for inspiration, ideation, and tedious tasks, though a

few expressed reservations about AI becoming a crutch or leading to inferior results. Opinions ranged from seeing AI as a tool for expanding creative possibilities to concerns about the devaluation of human artistry. Concerns were also raised over issues like plagiarism, the undermining of human effort, and job security for artists. Some also objected to its presence in the classroom, worrying it might hinder learning and the development of important skills. Students supported ethical AI training practices, with AI trained on one's own work or with consent, and they supported transparency in how AI is used in final works through citation.

3.4 Instructors' Reflection

Creative productivity in this course is based on the ability to communicate visually to your peers and to the instructor. It's important for students to constantly iterate, explore new directions, and seek different perspectives. We found that AI in the classroom gave us more space to discuss with students new possibilities for their projects. Students delivered a greater volume of concepts and inspiration to draw from, which helped with feedback. Students weak in traditional art and design had an avenue to share their ideas visually with others. It was common for students to treat genAI as a mood board tool, like Pinterest. GenAI was useful for the instructors, too: we could use it to create a reference point when discussing goals (e.g. showing a student what their project could look like in a different lighting setup). Instructors observed that, by the end of the course, students were aware of many of the discussions currently surrounding the role of AI in Art, particularly its ethical usage. Instructors spent class time discussing some of these concerns and the current events around genAI, and students brought their own findings to share. Students were relatively confident in delineating where they felt genAI was acceptable and when it wasn't.

4 DISCUSSION

Students were mistaken on certain definitions of AI, leading to confusion and faulty assumptions. Some respondents were also not aware of where AI was already implemented in their day-to-day software. This indicates that the instructors need to improve the instruction material so that students better understand fundamental AI concepts as well as where it is being used. Students also tended to cleave close to the examples given by instructors, instead of experimenting with new ideas. The production pipeline has many opportunities to augment creative and mundane workflows with AI, so the instructors expected more innovation from the students. To encourage novel AI-use, early research-based exercises could help. We also intend to make improvements to the course so that the class is a relatively consequence-free space to experiment with new AI techniques. To do this, we will need to continue to develop lectures and demos to broaden students' perspectives of AI and make curriculum adjustments so that students have guidelines that they feel comfortable working within. Transparency through documentation also seems to be a crucial issue for students, giving legitimacy and accountability to their work. As this technology continues to evolve, educators will continue to need to research these tools so that they can help their students navigate a changing industry and prepare them for new expectations.