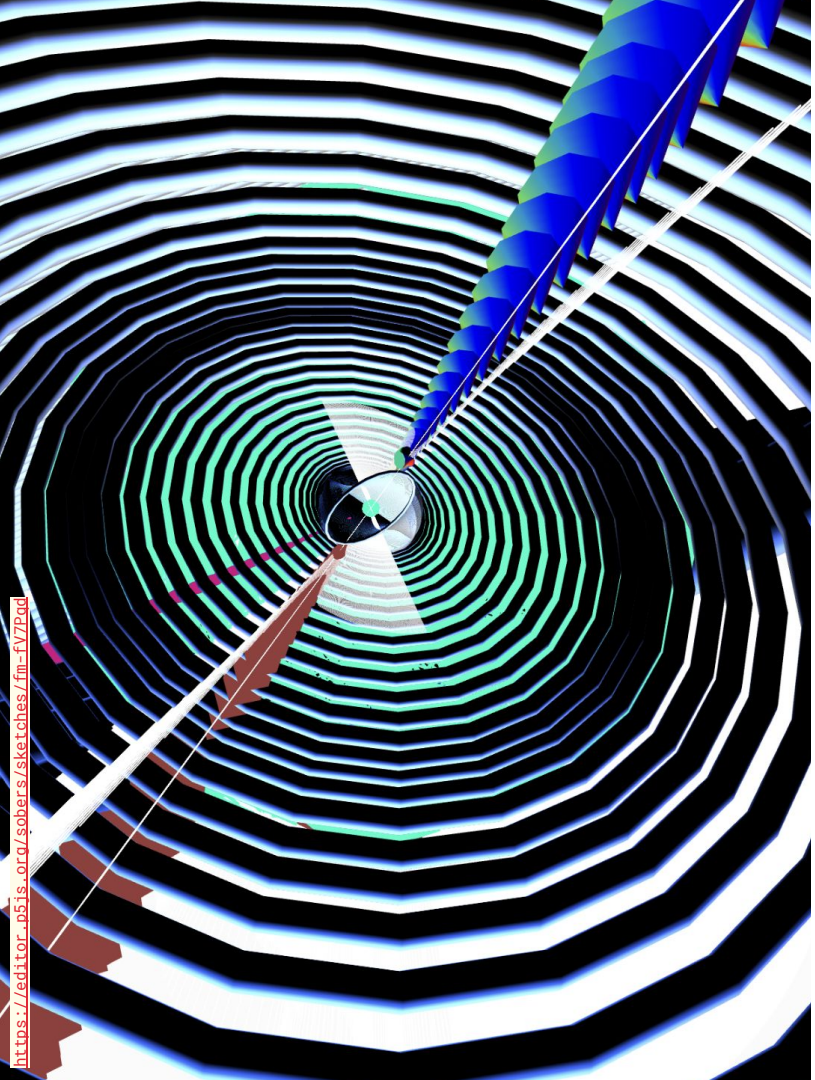


Fostering Play in Art + Technology

Final Report

Sophia Sobers

Introduction

Fostering Play in Art + Technology was established to explore methods of fostering playful exploration in learning technology within the Department of Digital Art’s Art + Technology and Interactive Arts programs.

By examining and cataloging effective teaching methods I amed to develop a catalog of practices to enhance learning in creative technology.

Leading Questions

How can teaching methodologies incorporate play and exploration to lower barriers towards for learning new and established technologies within creative disciplines?

Leading Questions

What improvements can be made to to enhance creative engagement and to help students overcome challenges in learning creative technology?

Project Goals

1 ➔ Explore methods to foster playful exploration in learning technology.

2 ➔ Explore how to make complex platforms like line-based and node-based coding accessible and inclusive.

3 ➔ Examine and gather creative technology teaching methodologies to develop a catalog of practices to enhance learning in creative technologies.

Survey

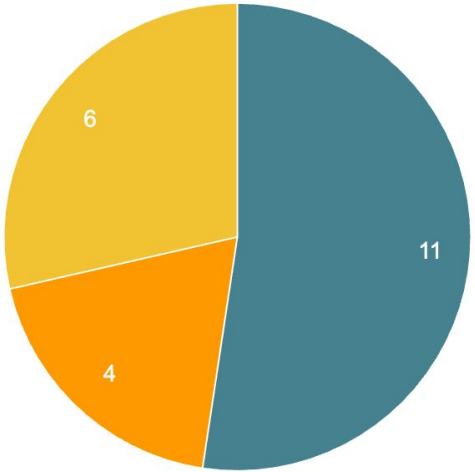
To better understand student experiences with learning technology in DDA, I began by conducting a survey of current students. The goal was to gather insights on their challenges, successes, and overall thoughts on learning new and established technologies.

The following summary is based on two surveys conducted in Spring and Fall 2024, which received a total of 20 responses.

Major

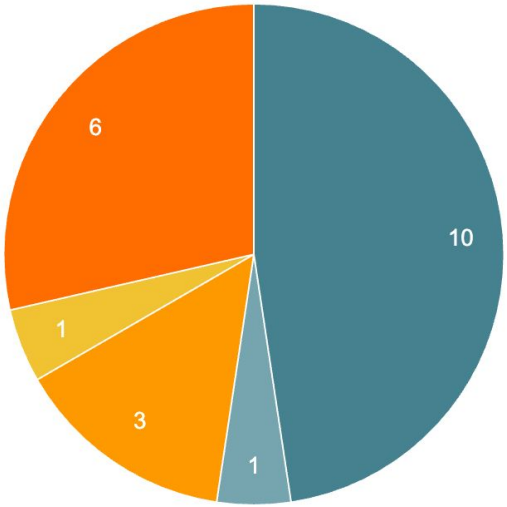
20 Responses

- MFA Interactive Arts
- BFA Interactive Arts
- BFA Art + Technology



Year of Study

- Graduate 1st Year
- Graduate 2nd Year
- Undergraduate Senior
- Undergraduate Junior
- Undergraduate Sophomore



In one word, how do you feel about learning new technology?

great (x2)

exciting (x2)

awesome

useful

interesting

expands my expression and possibilities

curiosity

overwhelming but exciting

unfamiliar

hard but fun

hard

challenging

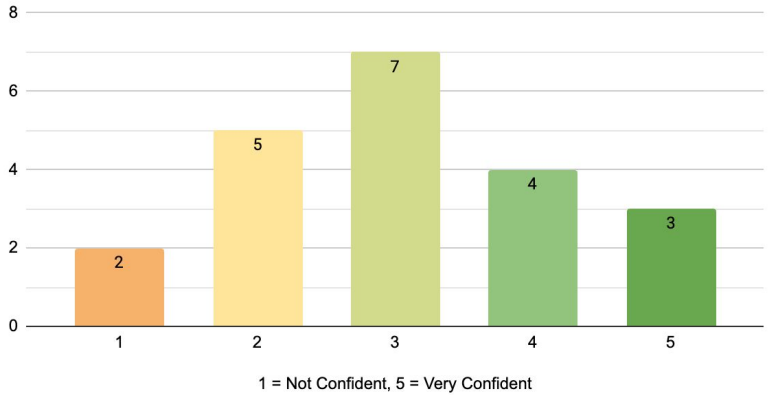
I feel nervous but excited at the same time

I’m excited about learning it but I also get frustrated when things don’t work

I find it interesting and believe I can learn new knowledge, but since I have never been exposed to programming-related knowledge, I find some concepts difficult to understand

Confidence in Creative Technologies

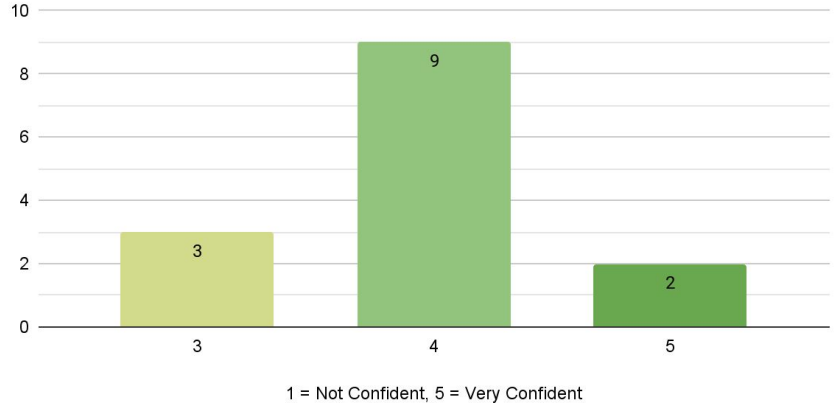
Before Pratt, how confident did you feel towards learning new technology?



Confidence in Creative Technologies

After taking a creative technical course at Pratt, how confident do you feel towards learning new technology?

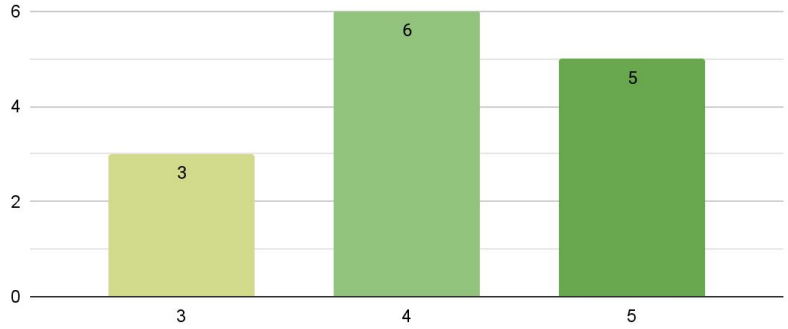
Note: Spring 2024 Results Only



Learning Experience

How enjoyable do you find the learning process in your technology-related courses?

Spring 2024 Results

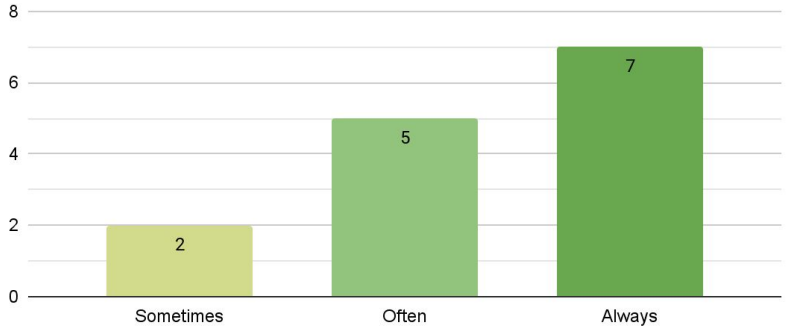


1 = Not Enjoyable, 5 = Extremely Enjoyable

Opportunities for Creative Exploration

How often do you feel you have opportunities for creative exploration in relationship to the technology you are learning in your courses?

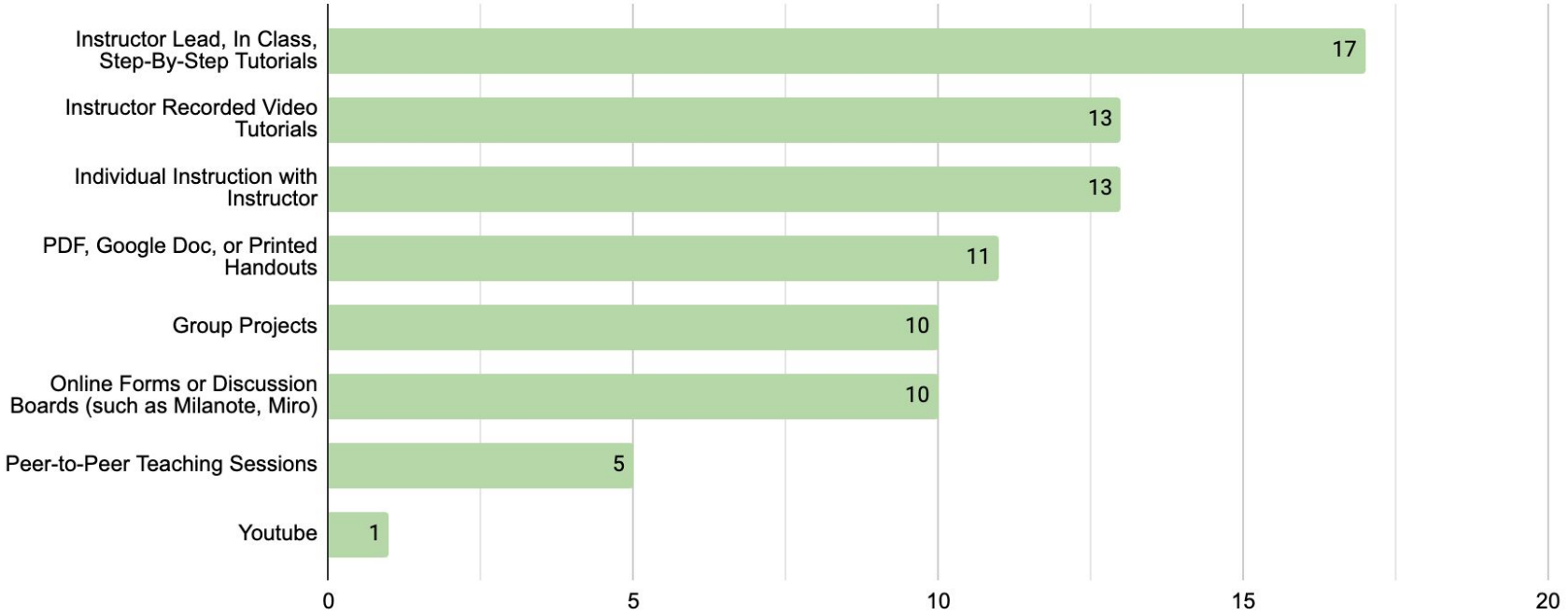
Spring 2024 Results



Opportunities for Creative Exploration

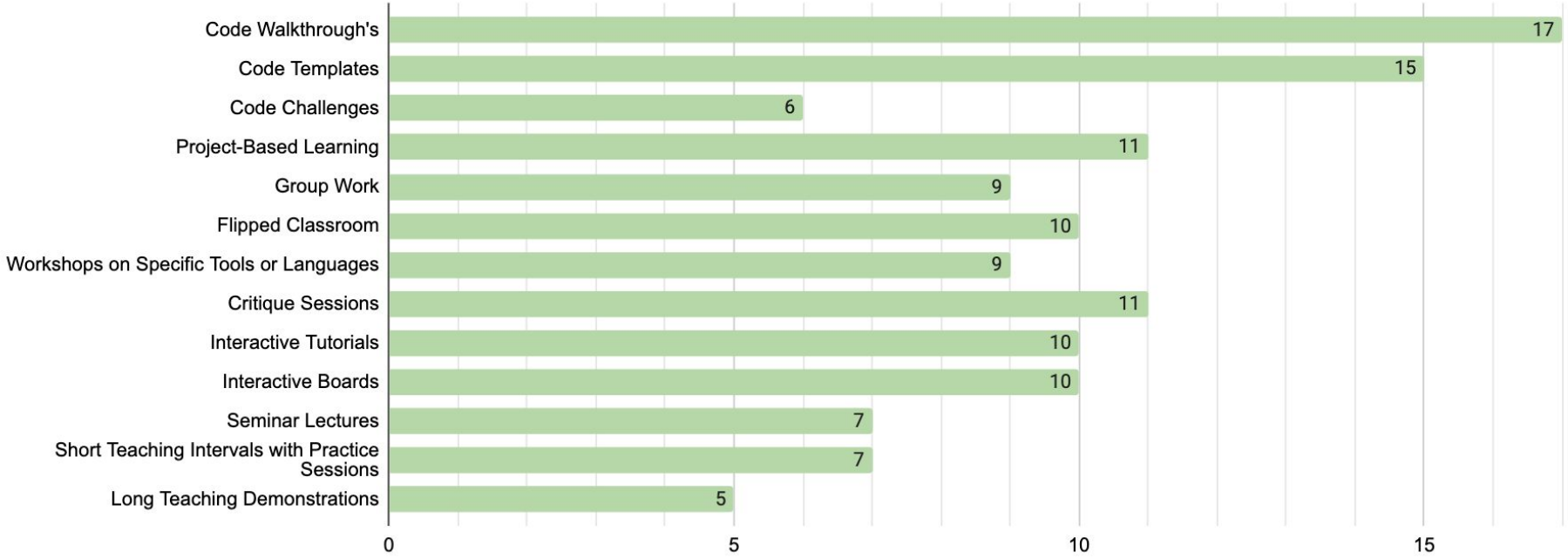
Learning Methods

Which of the following learning methods have you experienced in creative, technology-based classes?



Instructional Techniques

Which of the following instructional techniques have you experienced in creative, technology-based classes?



Preferences Ranked

Ranking of Average Scores for Teaching and Learning Preferences
Scale of 1 (Least Preferred) - 5 (Most Preferred)

Methods

4.4 Individual Instruction with Instructor
4.33 Instructor Recorded Video Tutorials
4.23 Instructor Lead, In Class, Step-by-Step Tutorials
3.76 Peer-to-Peer Teaching Sessions
3.6 Online Forms or Discussion Boards (Miro, Milanote)
3.31 Group Projects
3.26 PDF, Google Doc, or Printed Handouts

Techniques

4.4 Code Walkthrough
4.36 Project-Based Learning
4.25 Interactive Tutorials
4.21 Code Templates
4.18 Code Challenges
4.05 Interactive Boards
4 Workshops on Specific Tools or Languages
4 Critique Sessions
3.93 Short Teaching Intervals with Practice Sessions
3.5 Seminar Lectures
3.47 Group work
3.38 Long Teaching Demonstrations
3.37 Flipped Classroom

Successful Learning Experience

Describe a learning experience or method from your classes that you found particularly successful for understanding a particular technology, coding platform, or software. Why was it successful?

Learning Methods Identified by Students (pg 1 / 3)

📌 Step-by-Step Instruction

- *"Step-by-step teaching helped me build a solid understanding of using Arduino in physical computing."*
- *"Clear, structured guidance allowed me to have a vision of what I was doing. Having examples was very useful."*
- *"Learning TouchDesigner step by step with explanations made it easier to grasp."*
- *"Instructors explaining concepts first, demonstrating them, and then allowing students to practice was very effective."*
- *"I preferred structured lessons over simply following tutorials because they provided opportunities for direct feedback."*

📌 Project-Based Learning

- *"Working on a project that required new technology helped me focus on learning it, since I had a clear goal in mind."*
- *"Having a workshop where I could make something concrete helped me truly master the technique."*
- *"Project-based learning was helpful, but I think having a lecture before the project would improve retention."*

Successful Learning Experience

Describe a learning experience or method from your classes that you found particularly successful for understanding a particular technology, coding platform, or software. Why was it successful?

Learning Methods Identified by Students (pg 2 / 3)

📌 One-on-One Support

- *"Having an instructor available to answer specific questions helped me work through challenges more efficiently."*
- *"Individual support, whether in person or via detailed class materials, made a huge difference in my learning process."*
- *"Offline interactions with a professor were really helpful, especially for physical computing."*

📌 Pre-Recorded & Online Tutorials

- *"Online tutorials helped me as a beginner because I could rewatch them when I wasn't clear on something."*
- *"Having pre-recorded videos for TouchDesigner was great since I could revisit them later if I forgot how to use a function."*
- *"I found resources like YouTube and Google essential for quickly exploring and troubleshooting new technologies."*

Successful Learning Experience

Describe a learning experience or method from your classes that you found particularly successful for understanding a particular technology, coding platform, or software. Why was it successful?

Learning Methods Identified by Students (pg 3 / 3)

📌 Hands-On Activities & Interactive Learning

- *"Doing small in-class activities or challenges made learning fun and engaging, especially with an instructor available to help."*
- *"Workshops were the best way for me to learn because I could actively create something while mastering the technique."*
- *"Exercises that required us to immediately apply what we learned helped reinforce concepts."*

📌 Access to Course Materials & Documentation

- *"Having PDFs of class instructions, such as circuit connection guides, uploaded to Canvas was extremely helpful for reference while doing homework."*
- *"Learning materials that I could refer back to outside of class made a big difference in retaining information."*

Challenging Learning Experience

Describe a teaching style, method or experience that did not work well with your learning style. Why do you think it was less effective?

Challenges in Learning Methods Identified by Students (pg 1 / 3)

📌 Lack of Hands-On Practice & Application

- *"Learning technology without actually using it made it difficult to understand its purpose and function."*
- *"If students don’t get the chance to practice concepts in class, they face more problems and doubts when trying to apply them to homework."*

📌 Overwhelming Workload

- *"Having multiple assignments due in a week made it hard to fully explore concepts or meet expectations."*

📌 Passive Lectures Without Engagement

- *"Class lectures where we just sit and listen don’t work for me. Also, watching tutorials that aren’t integrated into class activities feels disconnected."*
- *"Long lectures don’t help, especially when there’s no recording to review later. Shorter lectures with time for questions are much more effective."*
- *"When new techniques are only presented in a lecture, I sometimes take a long time to figure out even simple concepts, and I hesitate to ask for help."*

Challenging Learning Experience

Describe a teaching style, method or experience that did not work well with your learning style. Why do you think it was less effective?

Challenges in Learning Methods Identified by Students (pg 2 / 3)

📌 Over-Reliance on Self-Learning

- *"Self-learning methods or classes that only cover the basics and expect students to figure out coding on their own can be frustrating, especially for beginners."*
- *"I still don't understand the basics of Arduino—I feel like I'm just following tutorials without truly knowing what's happening. I still don't know the difference between Ground and 5V or how sensors actually work."*

📌 Lack of Context or Clear Goals

- *"Covering different software without demonstrating its full potential left me without a clear vision of what's possible."*
- *"When I don't know the purpose or goal of learning a particular software, I struggle to stay engaged."*

Challenging Learning Experience

Describe a teaching style, method or experience that did not work well with your learning style. Why do you think it was less effective?

Challenges in Learning Methods Identified by Students (pg 3 / 3)

📌 Group Work Challenges

- *"Group projects were frustrating because people have different coding styles, which made it hard to understand each other's work."*
- *"Not everyone contributes equally in group work, which can create tension or make some students feel bad."*
- *"I personally just don't enjoy learning through group work."*

📌 Lack of Recorded or Supplemental Materials

- *"I found it really unhelpful when class material wasn't recorded. If I didn't understand something in class, I had no way to review it later."*
- *"Without tutorials, I struggled to understand new concepts on my own."*

Survey Analysis

Understanding Student Experiences and Preferences in Learning

Confidence in Creative Technologies

There was a noticeable increase in student confidence in learning new technologies after taking courses in DDA.

This suggests that the course structure and content were effective in enhancing student confidence and skill levels in creative technologies.

Learning Methods + Instructional Techniques

The preferred learning methods were individual instruction with an instructor, followed by instructor-recorded video tutorials and in-class, step-by-step tutorials. These methods scored highest in student preference, indicating their effectiveness in engaging students and facilitating learning.

The preferred instructional techniques were code walkthroughs, project-based learning, and interactive tutorials. These techniques were highly rated by students, emphasizing their appreciation for hands-on and interactive learning environments that allow them to engage deeply with the material.

Student Feedback on Learning Experiences

Positive feedback highlighted the effectiveness of step-by-step teaching methods, especially in understanding techniques and concepts in creative coding. Students appreciated being able to follow along and ask questions in real-time.

Some students noted the benefits of having projects tied directly to the technology being taught, which helped them focus and apply what they learned in a practical context.

Challenges and Areas for Improvement

Challenges included difficulties in maintaining engagement during lectures and the need for more hands-on or practical applications during instruction. Some students felt that certain teaching methods, such as lengthy lectures or purely theoretical instruction, were less effective.

Student Feedback: Improvements and Suggestions

The final survey question was directed towards student feedback on how the learning environment and course structure could be improved to better support their learning in creative technology. Suggestions included (pg 1 / 2):

📌 Enhanced Learning Support

- *“Troubleshooting and one-on-one sessions.”*
- *“More long-term projects to provide depth and context to learning.”*
- *“Leave some time for students to ask technical questions and solve them in class.”*

📌 Teaching Methods and Materials

- *“Introduce more workshops focused on specific tools or techniques.”*
- *“More step-by-step learning and rigorous critiques.”*
- *“Doing fun little exercises in class.”*
- *“Ensure fundamental concepts are explained from the beginning, even if they seem common.”*
- *“Recorded sessions to assist with independent review and learning.”*

Student Feedback:
Improvements and Suggestions

The final survey question was directed towards student feedback on how the learning environment and course structure could be improved to better support their learning in creative technology. Suggestions included (pg 2 / 2):

📌 Student Engagement and Interaction

- *“Classes where students can showcase skills in group activities, even if challenging.”*
- *“Encourage more in-depth discussion and interaction during lectures.”*

📌 Accessibility and Flexibility

- *“Offer various approaches to project prompts to accommodate different learning styles.”*
- *“Specific projects vs. open-ended projects to cater to different student preferences.”*

📌 Curriculum Structure

- *“Integrating more practical, hands-on experiences with new technologies.”*
- *“Balance between technical skills and artistic expression.”*
- *“Increase project-based learning which includes real-world application and critiques.”*
- *“Classes dedicated to technology from the first year to build a strong foundation.”*

DDA256: Creative Coding I
Applying Survey Insights

In Creative Coding I, we focused on practical application of HTML, CSS, and P5.JS, exploring how coding can be integrated into art and technology projects. The course included various in-class exercises designed to reinforce the concepts of creative coding, from generating sound directly in the web browser to engaging with WebGL for 3D visualizations.

The following teaching methods were used in Creative Coding 1 to enhance student learning →

- ➔ Project-Based Learning (Assignments)
- ➔ Step-by-Step Live Coding Demonstrations
- ➔ Coding Challenges
- ➔ Open Ended Explorations
- ➔ Prepared Code Examples
- ➔ Printouts
- ➔ Slide Lectures
- ➔ Milanote for Assignment Sharing
- ➔ Critiques

Semester Overview + Student feedback

During Weeks 9 and 10, feedback was gathered through surveys and at the end of the semester, individual instructor-student meetings were held to evaluate the effectiveness of teaching methods and projects in the course. The following slides summarize teaching techniques, identifies student preferences for projects, and provides final reflections on the semester's teaching and learning outcomes.

Projects +
In Class Exercises

Students engaged in diverse projects that allowed them to apply coding skills in creative contexts.

WebGL
Students found working with WebGL particularly cool and different, appreciating the ability to explore 3D graphics.

Mini Game Project
Designing games provided a fun and engaging way to learn programming logic and interactivity.

Creative Drawing with Code
Projects that combined code with artistic expression, like using P5.JS to draw or integrate Arduino for interactive artworks, were highlighted as especially enjoyable.

Text-Based Projects
Hidden projects, poetic texts, and hypertext assignments allowed students to experiment with narrative and digital presentation forms

Student Feedback on In Class Learning Experiences

Most Enjoyable

Students enjoyed the open-minded approach to projects, highlighting the freedom to explore new ideas.

Least Enjoyable

Students expressed one specific class project as their least favorite - vectors and data visualization. This topic was introduced with two introductory code demonstrations but primarily relied on individual learning experience through pre-prepared code examples and written overviews. This amounted to frustration in learning a more complex topic.

Teaching Methods + Student Feedback

Effective Methods

Direct links to code examples, the use of Notion for organizing course content, and displaying images of student work in class were effective in making the learning process understandable and relatable.

From a mid-semester feedback form, students appreciated more hands-on experiments, step-by-step demonstrations, and project-based learning, noting these methods helped clarify complex concepts and encourage active participation.

Areas for Improvement

Students sought more examples of artwork to inspire and guide their own project development. Additionally, there was a call for a balance between guided and open-ended projects, with some students preferring more structured assignments.

From a mid-semester feedback form, students felt that less effective teaching methods included traditional lectures and printed handouts. Students expressed a desire for engaging and interactive course materials and learning methods.

Reflection + Concluding Thoughts

Teaching Methodologies

The following is an index of teaching methods that were indicated as successful through surveys and as seen in application in DDA256

Hands-On Learning

Projects and in-class exercises were pivotal. Students particularly valued project-based learning where they could apply technical skills in a practical context, fostering deeper understanding and engagement.

Interactive Demonstrations

Step-by-step live coding and interactive tutorials helped students grasp complex concepts by allowing immediate application and feedback.

Resource Accessibility

Providing students with accessible online resources and recorded sessions helped reinforce learning outside the classroom.

Personalized Instruction

One-on-one sessions and the ability to ask questions in real-time during classes supported individual learning needs, making technology more accessible.

Project Reflection

This past year's focus on integrating feedback and diversifying learning activities has refined the teaching approach in the Creative Coding I: Sketches course, fostering a more tailored and experiential learning environment for students.

The projects completed by students demonstrated advanced approaches towards complex code and its application in comparison to similar courses taught in the past, such as DDA617 Languages.

Notably, thematic assignments effectively consolidated course material and techniques in application towards creative projects, helping to enhance students' understanding and retention. However, this does not cater to students who seek to have more practical, direct application of techniques..

In-class coding challenges emerged as an exceptionally effective method for engaging students in creative problem-solving. These challenges not only prompted the immediate application of coding concepts, but also revealed the varied strategies students employed to solve identical problems. This form of interaction bolstered critical thinking and practical application of coding techniques.

Project Reflection

This fellowship has been a pivotal experience, providing me the space to question, experiment, and ultimately enhance how we engage students in a technologically ever-changing landscape.

The opportunity to analyze and adapt my teaching approach has not only impacted my students' learning experiences but has also fostered personal and professional growth. I have gained invaluable insight into the ever changing educational environment.

I am inspired to carry these lessons into future semesters to enhance educational methodologies and to inspire our students to explore, create, and innovate without bounds.

Thank you to everyone at CTL and the colleagues and students who participated in this - your contributions, feedback, and enthusiasm helped shape this journey.