MY TEACHING PHILOSOPHY AND EXPERIENCE

Intrinsically motivated students engage with coursework for "inherent satisfaction rather than for some separable consequence" [1]. On the other hand, extrinsically motivated students are driven by external motivators like rewards (e.g. good grades). Intrinsically motivated students generally perform better academically than extrinsically motivated students [2]. Furthermore, external rewards like high grades typically act as a transient motivator for low performing students [3]. It's also much more challenging for educators to maintain the interest level of students who are struggling academically with external rewards. One "A" in a class will likely not instill enough confidence in a student who feels defeated, nor will it trigger further motivation.

Williams et al. [2] identified five key ingredients for motivating students. student, teacher, method/process, content, and environment. I use these ingredients as inspiration to formulate my teaching philosophy for driving intrinsic motivation:

1. **Student:** foster a safe and respectful learning environment for students of all backgrounds.
2. **Teacher:** aim to improve my teaching skills through peer and student feedback.
3. **Content:** develop course content to satisfy the following objectives:
    - Ensure that the students feel the course content is relevant to their future employment and/or life skills. "Making the content relevant to real life can increase a student's motivation."[2]
    - Develop exercises that involve creativity and critical thinking.
    - Novel content provokes intrigue and can result in short-term interest and motivation.
4. **Method/Process:** present the course content in a way that drives motivation:
    - Encourage positive social interactions via group work and group presentations.
    - Utilize self-learning and learning through experience.
5. **Environment:** Teamwork is not only a practical skill, but an "environment of teamwork can contribute to learning."[2]

CONTENT - EQUIP STUDENTS WITH PRACTICAL SKILLS

As stated above, course content that is relevant to students' life and work skills will more reliably elicit intrinsic motivation. Consequently, weaving practical examples, knowledge, and skills into course content is a priority of mine while developing course material.

I taught CS 105: Introduction to Computer Science at the University of Massachusetts-Boston, which was an introductory course offered to students outside of the Computer Science department. The majority of the students didn't have a background in STEM but were required to learn the basics of programming as part of the course syllabi. Instead of assigning them the typical "build a calculator" assignment, I opted to teach them the same programming concepts via an assignment that equipped them with more practical skills. I designed a programming assignment that required students to build a personal website with HTML, CSS, and JavaScript. The students also learned to host this website under the school's domain, a valuable skill for job hunting in this digital era. Students voted on their favorite website design and the winners received bonus points. This motivated the students to unleash their creativity and experiment which led to a more effective learning experience. Exercises like this is how I cultivate creativity and arouse intrinsic motivation.

METHOD/PROCESS & ENVIRONMENT - UTILIZING/TEACHING TEAMWORK

Communication and collaboration are soft skills that will be instrumental in students' careers regardless of their future occupation. In any class, there will be students that are already adept at these skills, but there will also be students that have room for improvement. There is no downside to providing opportunities to practice teamwork. Thus, I proactively incorporate them into the courses I teach. I aim to create a healthy environment where teams are a support system that builds the confidence of team members that are struggling and also allows the stronger members of the team to hone their leadership skills.

In the CS 105 class that I taught, I wanted students to experience game development–another creative exercise that will elicit the intrinsic motivation of students. It would have been easy to leave the project as an individual assignment but instead, I developed it into a group project. I simplified and adapted a Unity tutorial for moving a tank in a 3D environment using keyboard controls. I used class time to help the students set up the Unity scene and familiarize themselves with the environment. I strongly emphasized the importance of utilizing good communication, good leadership, and open decision-making and incorporated these benchmarks into the project's grading rubric. Students successfully collaborated to build their first mini-game, an incredible feat for those with little to no programming experience.

[1] Pierre-Yves Oudeyer and Frederic Kaplan. "What is intrinsic motivation? A typology of computational approaches". In: *Frontiers in Neurorobotics* 1 (2009), p. 6. ISSN: 1662-5218. DOI: 10.3389/neuro.12.006.2007. URL: https://www.frontiersin.org/article/10.3389/neuro.12.006.2007.

[2] Kaylene C Williams and Caroline C Williams. "Five key ingredients for improving student motivation". In: *Research in Higher Education Journal* 12 (2011), p. 1.

[3] Ruth Butler. "Enhancing and undermining intrinsic motivation: The effects of task-involving and ego-involving evaluation on interest and performance". In: *British journal of educational psychology* 58.1 (1988), pp. 1–14.

CONTENT & METHOD/PROCESS - SELF-LEARNING THROUGH EXPERIENCE

Intrinsic motivation can be sustained by consistently arousing students' interest with illustrative self-learning examples. These examples will allow them to grasp core concepts as well as intrigue them enough to expand their knowledge beyond what's taught in the class. Not only will their enthusiasm feel rewarding to me, but hopefully this will lead them to explore these subjects as a prospective career or research direction.

I taught the students of CS105 the basics of computer graphics and 3D modeling by arranging a workshop at the University of Massachusetts-Boston MakerSpace. The students modeled, customized, and 3D printed keychains personalized with their name using Tinkercad. The students had a hands-on experience with adding and subtracting 3D objects that helped solidify what they learned in the lectures. It also had the added bonus of introducing them to the MakerSpace. Several students have exclaimed their astonishment at what is offered in the MakerSpace and became regular visitors.

TEACHING INTERESTS

GENERAL INTERESTS

Based on my background (Human-Computer Interaction, Computer Graphics, Computer Vision, and applied Machine Learning) and teaching experience, I would be interested in teaching and/or establishing courses that are relevant to the following topics:

- Computational Interaction Design
- Virtual/Augmented/Mixed Reality
- Human-Computer Interaction
- Computer Animation
- Computer Games Programming
- Computer Graphics
- Computer Vision
- Image Processing
- Artificial Intelligence
- Object-Oriented Programming