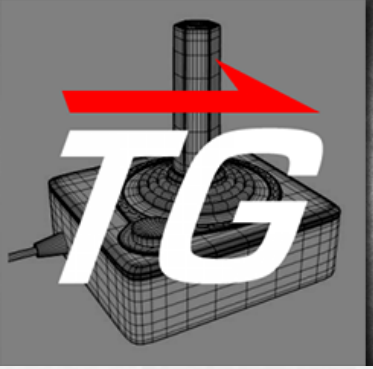


Transformative Games

Learning By Design

Game Design as Classroom Laboratory

Robert O. Duncan
Assistant Professor of Behavioral Sciences

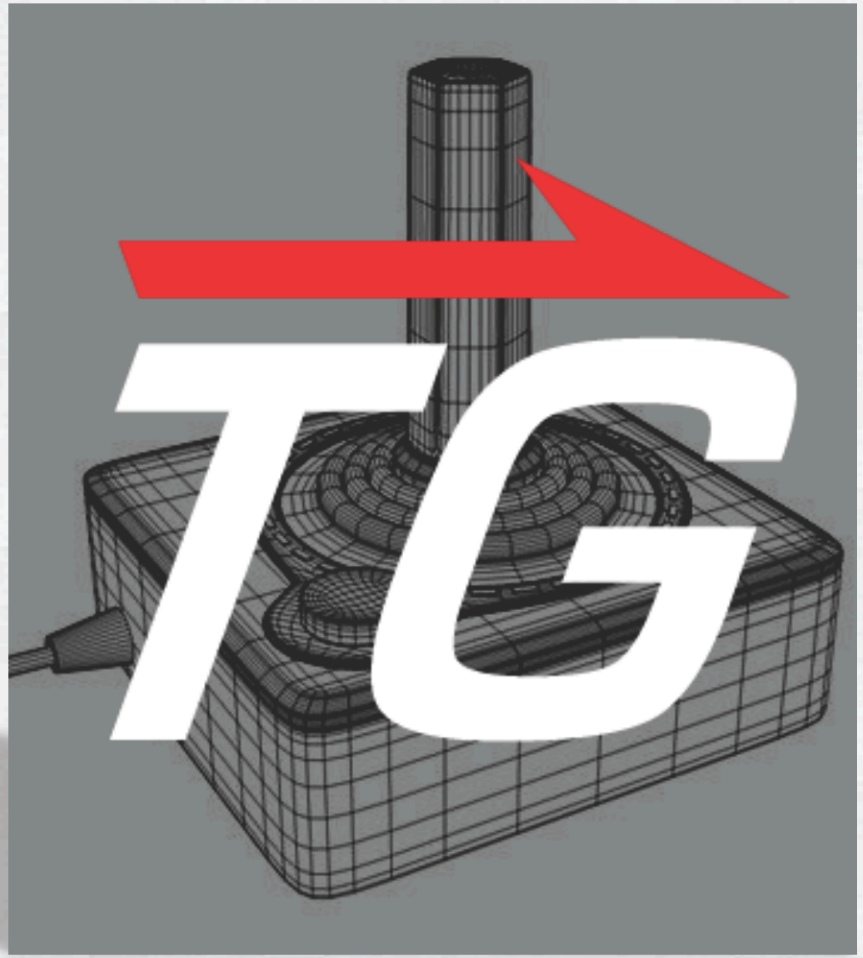
YORK College

CUNY The City University of New York

CUNY Games Network

Transformative Games Initiative

- Serve students by providing opportunities for game-based learning
- Promote learning by engaging students in design
- Provide instructors with tools for the classroom
- Facilitate research in pedagogy and game-based learning



Goals

1. Learn the rationale for infusing research, creative scholarship, and research-like practices into the classroom.
2. Learn about national models for undergraduate research and discuss best practices.
3. Discuss how GBL and UR research can be implemented in every classroom starting in the freshmen year.

UNDERGRADUATE RESEARCH DEFINED

Definitions

- Undergraduate research – “an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline.”
- Creative scholarship - While UR traditionally refers to STEM disciplines, these practices also apply to creative scholarship in the arts and humanities.
- Other relevant methods include *problem-based learning* & *inquiry-based learning*

Characteristics

1. Mentorship – Collaborative, clear goals, focus on the student, disciplinary socialization.
2. Originality – Novel contribution to the discipline, meaningful and significant contribution by student.
3. Acceptability – Uses accepted practices for the discipline.
4. Dissemination – Must produce a final product to be reviewed or judged.

Origins

- Council on Undergraduate Research (founded 1978)
  - Focused on STEM research in PUIs
  - Started with “problem-based” learning in medical schools
  - Particularly McMaster University (Barrows & Tamblyn, 1980)
- Boyer Commission (1998)
  - Urged universities to engage undergraduates more effectively
  - Advocated research-based learning as the standard
- Kuh (2008): High-impact educational practices
  - National Survey of Student Engagement (NSSE)
  - Undergraduate research has a huge positive impact on students

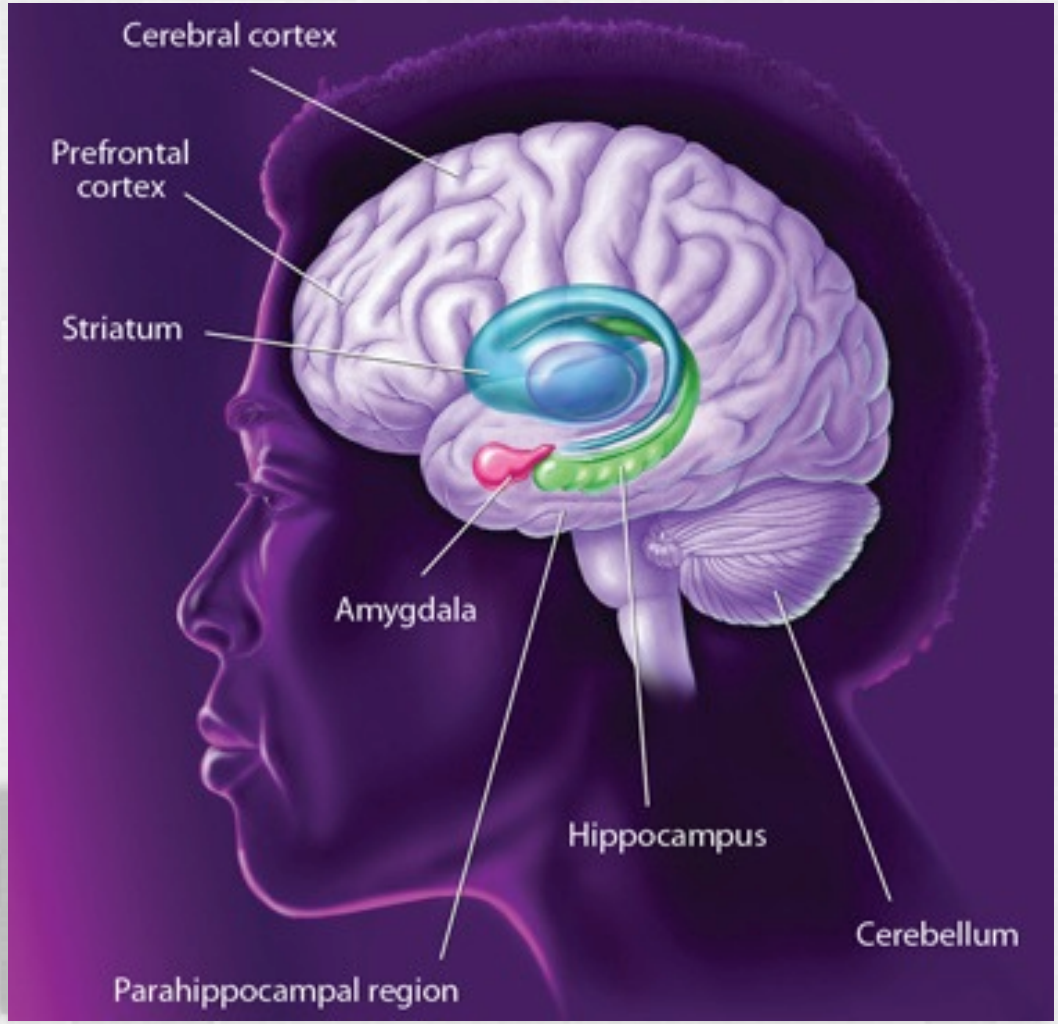
BEST Design Principles

1. Institutional leadership
2. Targeted recruitment
3. Engaged faculty
4. Personal attention
5. Peer support
6. Enriched research experience
7. Bridging to the next level
8. Continuous evaluation
9. Comprehensive financial assistance
10. Evidence-based practices

Chubin, D.E. and Ward, W.E. (2009).

RATIONALE

Neural Circuits for Learning



Optimal Conditions for Learning

- Perception for action
- Attention
- Motivation
- Emotional engagement
- Information must be novel and biologically relevant
- Behavioral consequences for action

Additional Motivations

- To better prepare learners as practitioners of their discipline (cognitive and intellectual growth)
- To communicate the excitement of discovery
- Socialization to the discipline
- Engaged learning practices are more effective
  - National Survey of Student Engagement (NSSE)
  - Student Success in College: Creating Conditions that Matter (2005, Jossey-Bass & AAHE)
  - Greater Expectations: A new vision for learning as a nation goes to college (2002, AAC&U)
  - College learning for the new global century (2007, AAC&U)

MODELS AND PRACTICES

National Model

- Early exposure
- Search and evaluate the primary literature (e.g., C.R.E.A.T.E.).
- Articulating precise research questions
- Designing experimental approaches to problem solving using accepted practices
- Dissemination via local and national conferences, undergrad journals, & peer-reviewed journals

CUR and NCUR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teaching
fun
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WebDev
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Undergraduate Research
Learning Through Research
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Governance
Advocacy
Resources
NCUR 2014 is April 3-5, 2014 at the University of Kentucky
Latest News
RSS
CUR Fellow Award Recognizes Excellence in Undergraduate Research
The Council on Undergraduate Research Acknowledges the Leadership of Mark Brodl and Mitch Malachowski
January 9, 2014 CUR E-newslwetter
January 9, 2014 CUR E-newslwetter
December 12, 2013 CUR E-newsletter
December 12, 2013 CUR E-Newsletter
Event Calendar
View All Events
Feb 20-22
CUR Dialogues 2014 Striving and Thriving: Fostering Successful Research Environments
February 20, 2014-February 22, 2014
Feb 21
Poster Submission Deadline 2014 CUR Conference
February 21, 2014
Mar
Broadening Participation Institute
NCUR 2014
NCUR 2014
April 3-5
UNIVERSITY OF KENTUCKY
National Conference on Undergraduate Research
April 3-5, 2014
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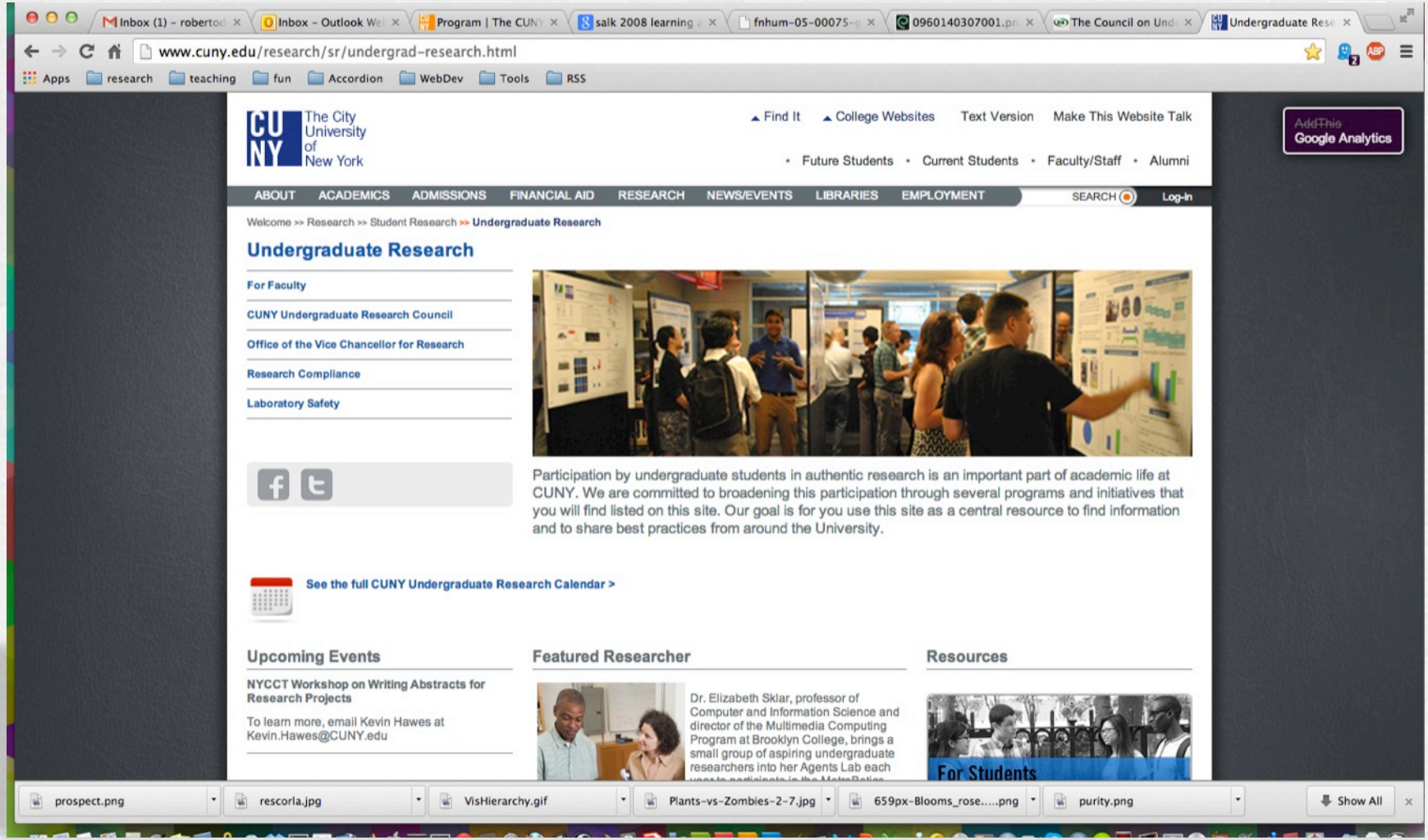
CUNY and CURC



Your College Office of Undergraduate Research

INFUSING RESEARCH INTO THE CURRICULUM

Institutional Mechanisms

- First year experience
- Communities of research
- Honor's programs
- Discipline-specific affinity groups
- Research Day
- Summer research programs
- Student abroad
- Undergraduate research journals
- Support for faculty scholarship

Discipline-Specific Mechanisms

- Independent Study
- Capstone courses
- Lab courses
- Flipping the classroom
- Federal Work-study
- Communities of learning
- Lecture series

Classroom Mechanisms

- Searching the primary literature (e.g., www.teachCREATE.org)
- Stimulating attitudes of inquiry with problem-based learning (e.g., www.sigmaxi.org)
- Cooperative learning and lab-based projects (e.g., www.merlot.org)
- Field work, field trips, student abroad
- Debate
- Composition, performance, creative writing, media production
- Posters, presentations, peer-review
- Peer-mentoring
- Responsible conduct, philosophy of science, research methods, safety, IRB

Methods of Assessment

- Testing process knowledge rather than content knowledge (fluid vs. crystalized intelligence)
- In-class
  - Originality
  - Topical
  - Acceptable methods
  - Experimental design, statistical analysis, and interpretation
- Out-of class
  - Classroom presentations
  - Local conferences
  - National conferences
  - Undergraduate research journals
  - Peer-reviewed journals

Classroom Project

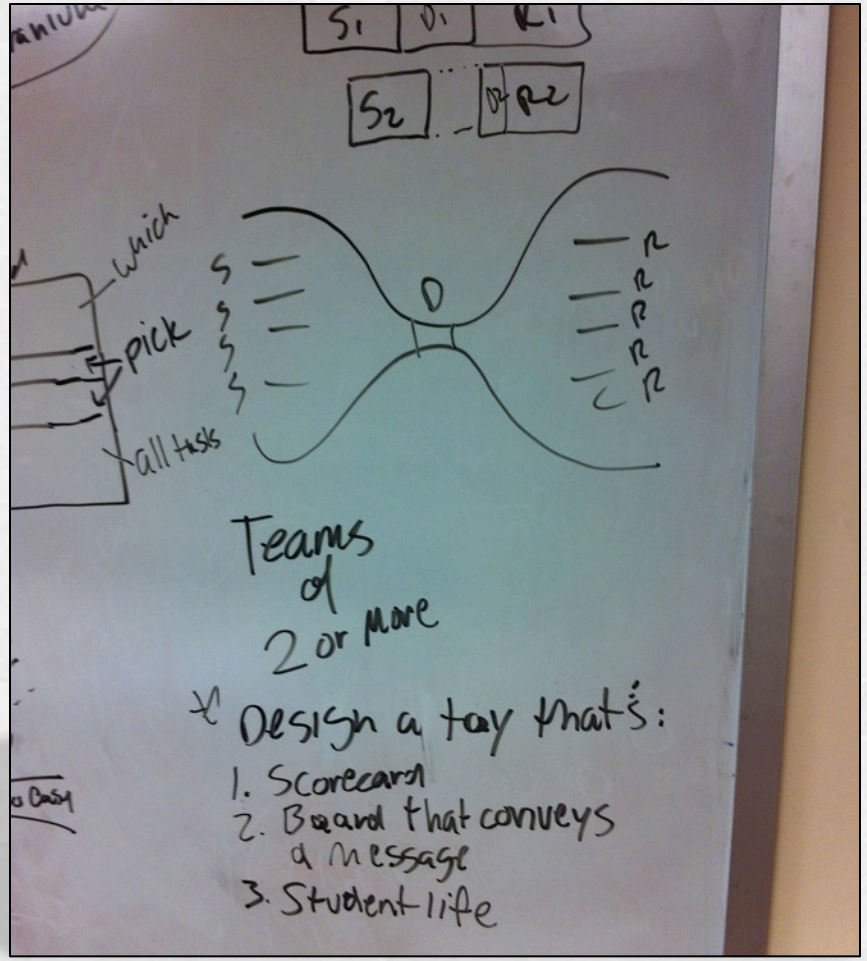
- Flipped classroom with just-in-time instruction
- Start with low-stakes lab assignments to build design skills and problem solving.
- 9-week group project, and 9-week individual project.
- Replace your classroom paper with a game-based learning project, where students design a game, collect data, analyze data, and report outcomes in class.
- Encourage the best students to present work at local and national conferences.

Laboratory Research

- Adopt SCRUM
- Small teams are generally stronger than individuals
- Use a syllabus with production milestones
- Ideally, project management falls in the hands of the student (use Blackboard)
- Allow them to carry the ball as far as they can, but provide instruction and support as needed
- User guided tutorials (e.g., Unity3d or Lynda.com)
- Open-source software or freeware

Our Process

- Iterative Design
  - Brainstorming
  - Paper prototypes
  - Digital prototypes
- Machinations
- UML
- OOP in Flash or Unity3d



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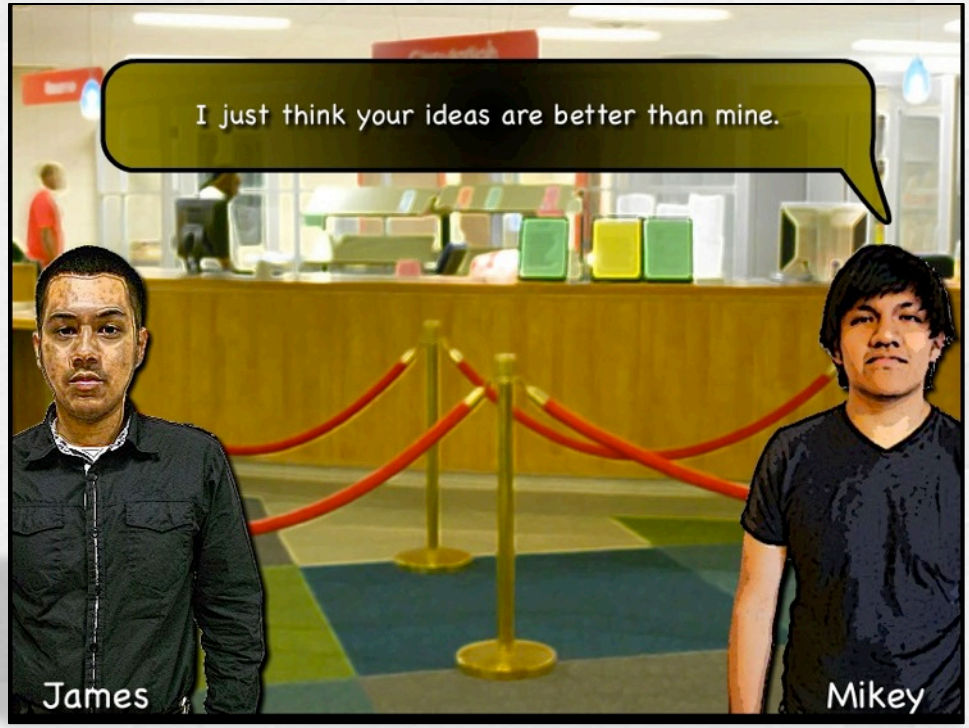

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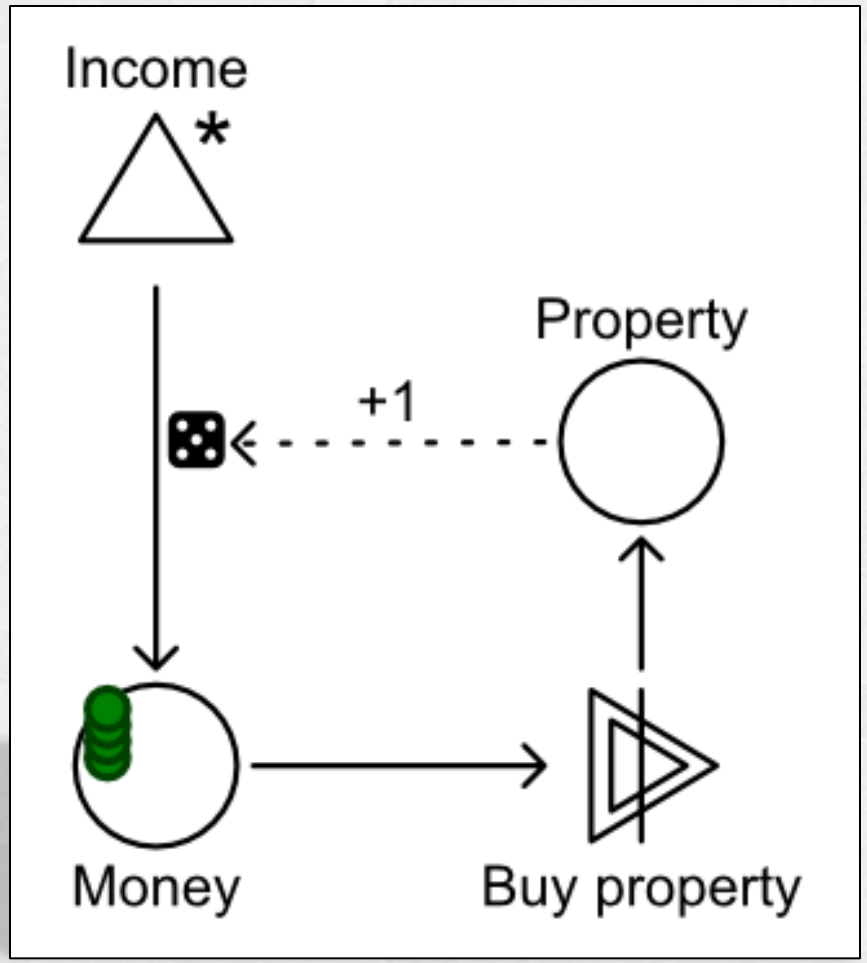

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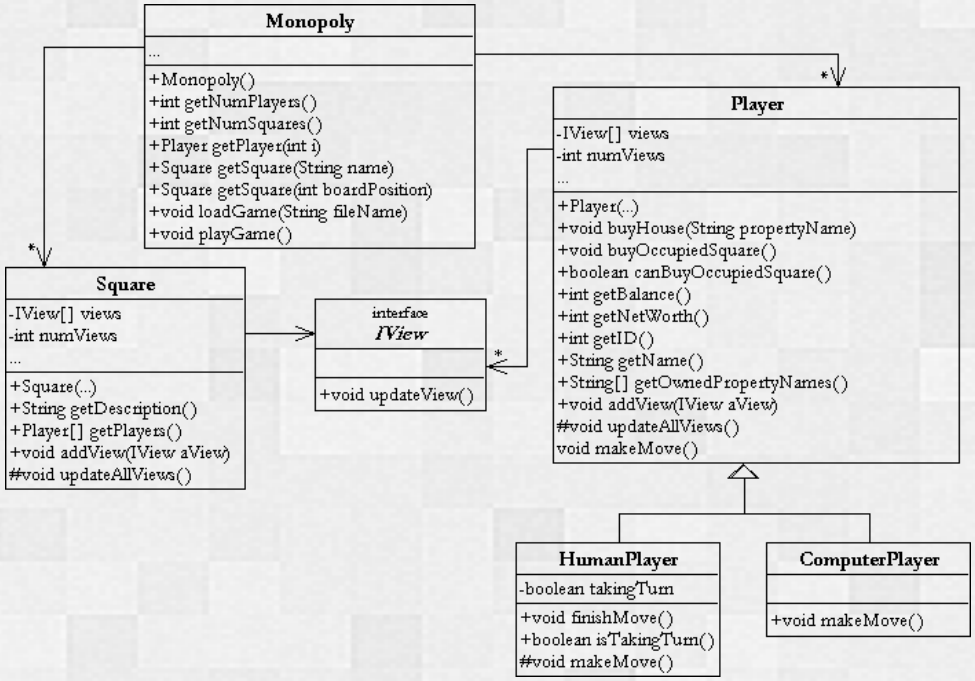
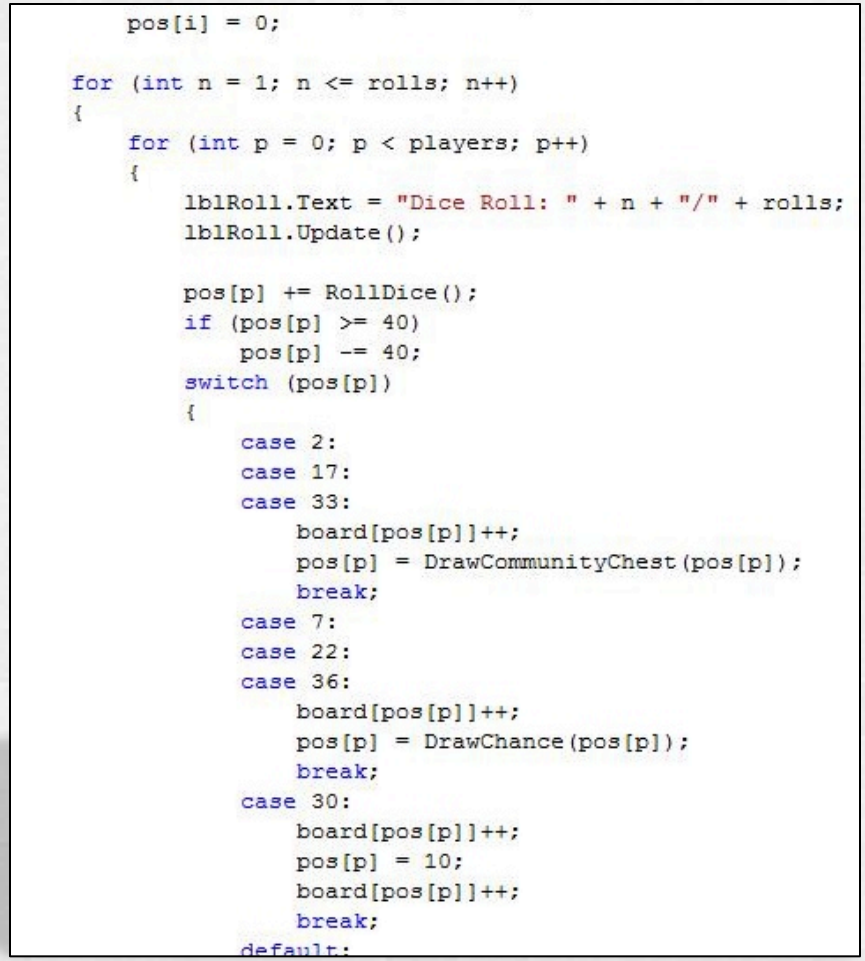


Our Process

- Iterative Design
  - Brainstorming
  - Paper prototypes
  - Digital prototypes
- Machinations
- UML
- OOP in Flash or Unity3d (using C# so students learn a real language).

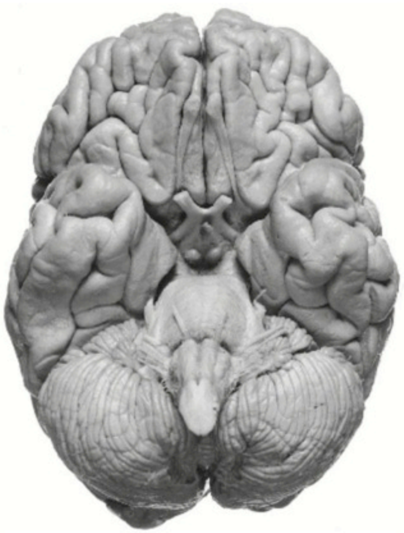


```
        pos[i] = 0;

    for (int n = 1; n <= rolls; n++)
    {
        for (int p = 0; p < players; p++)
        {
            lblRoll.Text = "Dice Roll: " + n + "/" + rolls;
            lblRoll.Update();

            pos[p] += RollDice();
            if (pos[p] >= 40)
                pos[p] -= 40;
            switch (pos[p])
            {
                case 2:
                case 17:
                case 33:
                    board[pos[p]]++;
                    pos[p] = DrawCommunityChest(pos[p]);
                    break;
                case 7:
                case 22:
                case 36:
                    board[pos[p]]++;
                    pos[p] = DrawChance(pos[p]);
                    break;
                case 30:
                    board[pos[p]]++;
                    pos[p] = 10;
                    board[pos[p]]++;
                    break;
                default:
```

GALLERY

FUNCTION

Olfactory



Olfactory

FUNCTION

STRUCTURE

Cranial Nerve 1

Cranial Nerve 1

STRUCTURE

P.T.S.D.

Disabling anxiety, nightmares, or flashbacks after a traumatic event.

+1 Card
+2 Actions

$2

Exposure

Facing your phobia by desensitizing yourself to the situation.

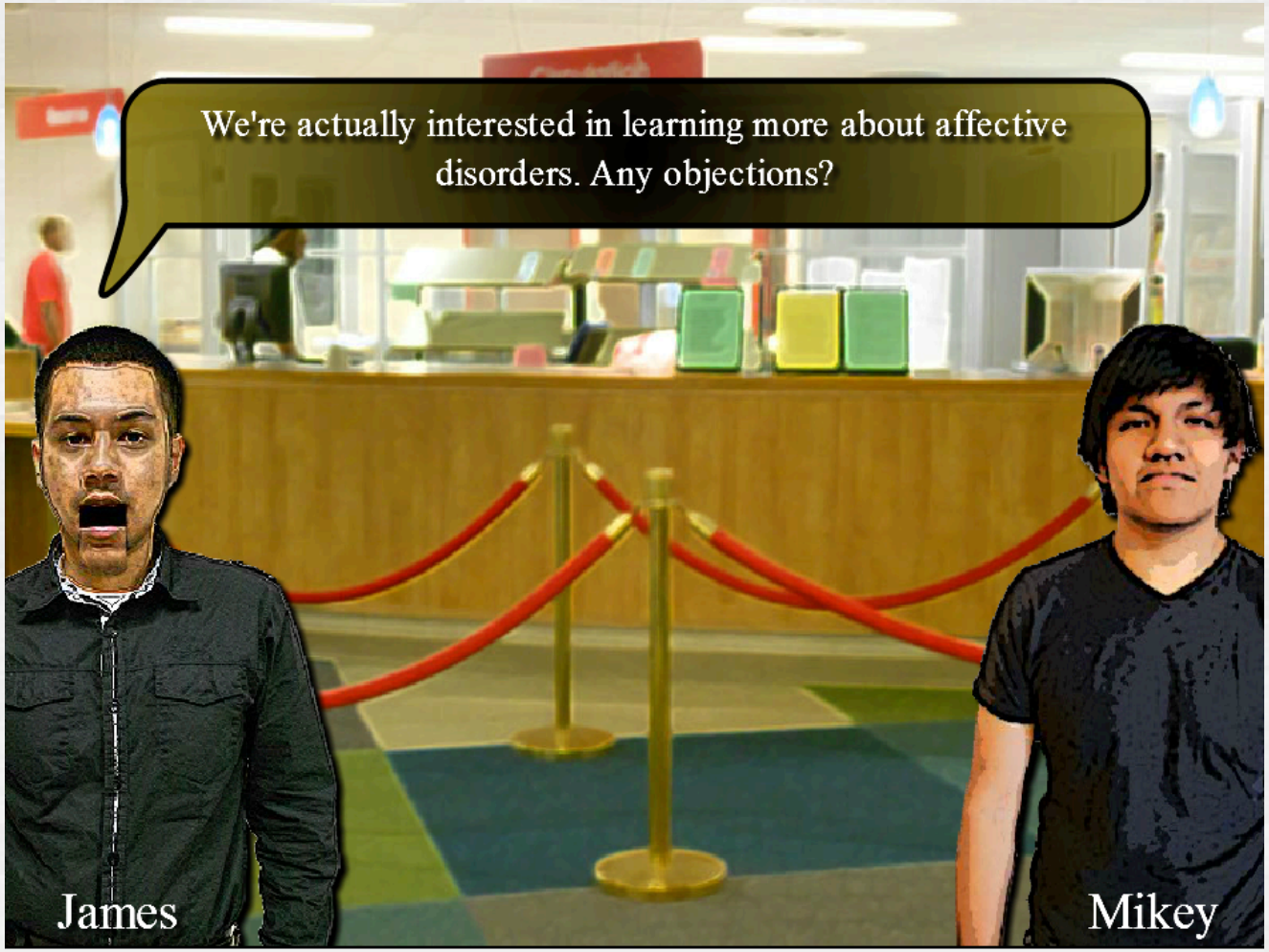
+2 Copper +1 Buy
Helps Specific Phobia, Social Anxiety, Agoraphobia, and Panic Attacks

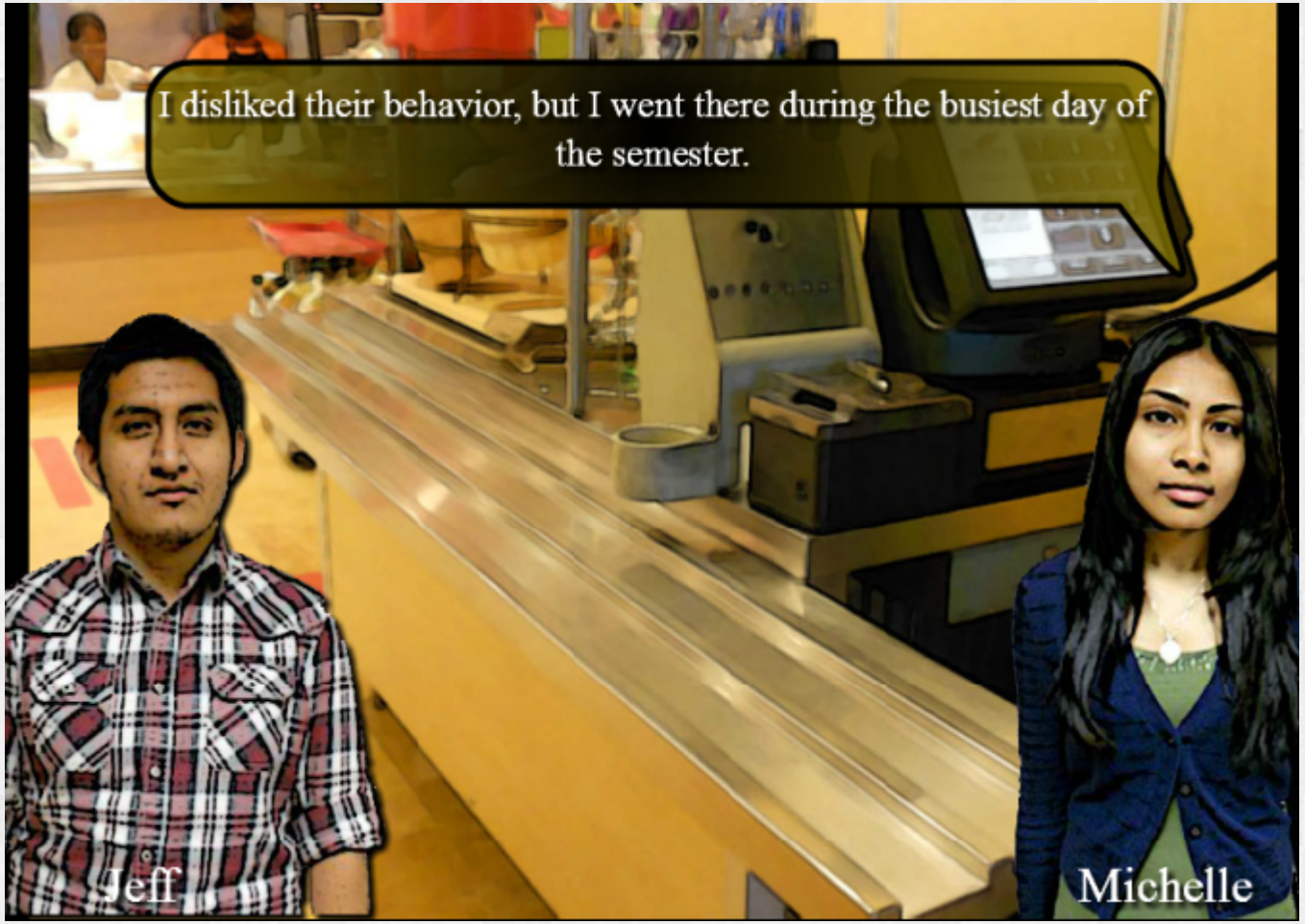
$1

Pen: Color: iSKETCH Trial: 4/60

Beach

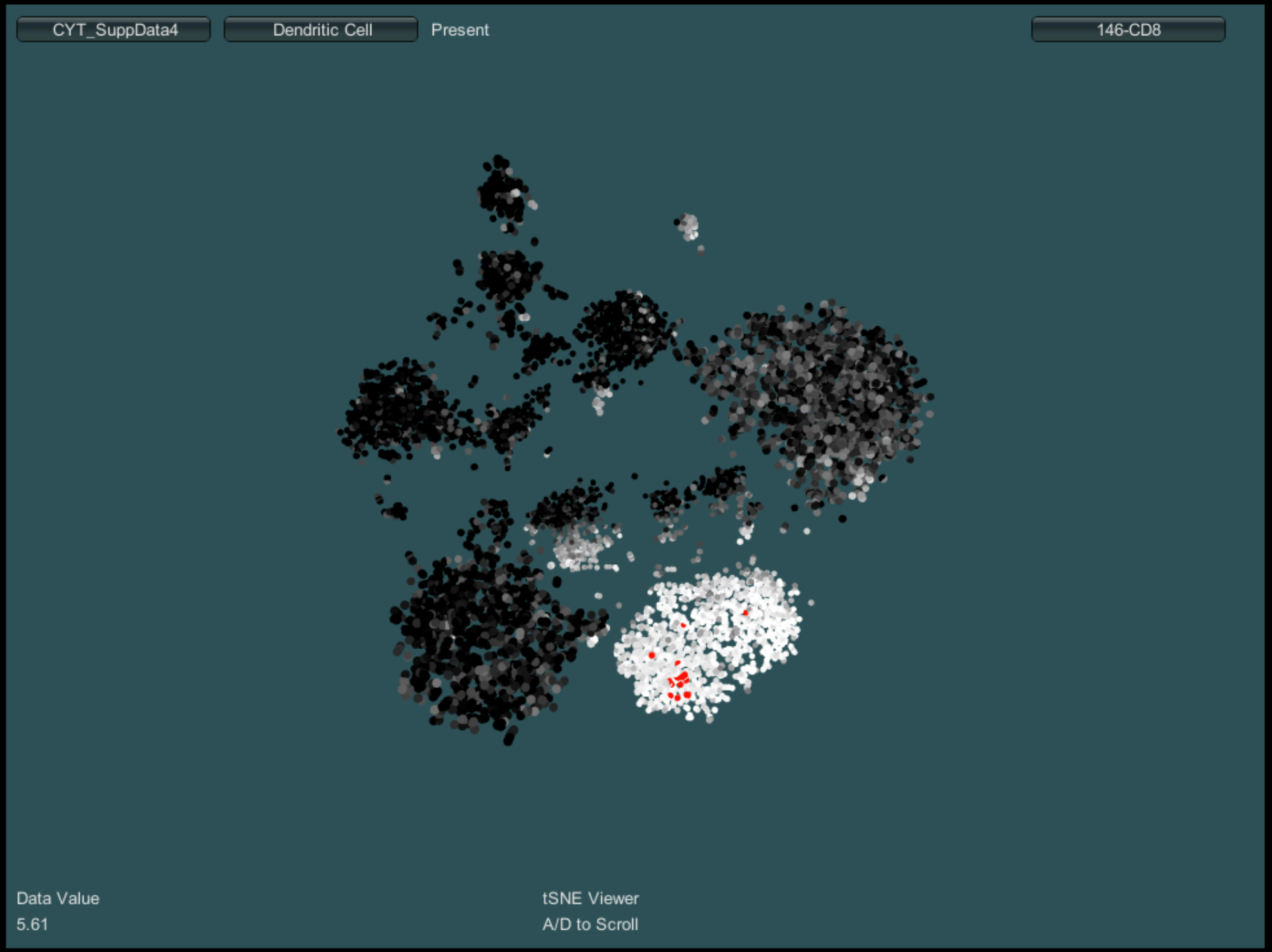
Rating (1=Bad & 5=Good)


We're actually interested in learning more about affective disorders. Any objections?
James
Mikey


I disliked their behavior, but I went there during the busiest day of the semester.
Jeff
Michelle


PLAYER 1
Round: 2/2
Wins: 0
Property: 1
Assets:
$100k
CURRENT CHALLENGE
Highest: Polyunsaturated Fat
Lowest: Total Fat
PLAYER 2
Round:2/2
Wins: 0
Property: 1
Assets:
$200k
Nutrition Facts
USDA CMDTY
Calories 129
Total Fat 7%
Saturated 6%
Monounsaturated 2g
Polyunsaturated 1g
Cholesterol 22%
Sodium 10%
Carbohydrates 0%
Dietary Fiber 0%
Sugars 0g
Protein 44%
Nutrition Facts
GUAVA SAUCE
Calories 36
Total Fat 0%
Saturated 0%
Monounsaturated 0g
Polyunsaturated 0g
Cholesterol 0%
Sodium 0%
Carbohydrates 3%
Dietary Fiber 14%
Sugars 6g
Protein 1%
Nutrition Facts
PREGOPASTA
Calories 69
Total Fat 4%
Saturated 0%
Monounsaturated 0g
Polyunsaturated 0g
Cholesterol 0%
Sodium 15%
Carbohydrates 3%
Dietary Fiber 9%
Sugars 8g
Protein 3%
Nutrition Facts
TORTELLINI
Calories 307
Total Fat 11%
Saturated 18%
Monounsaturated 2g
Polyunsaturated 0g
Cholesterol 14%
Sodium 17%
Carbohydrates 16%
Dietary Fiber 8%
Sugars 1g
Protein 27%
Nutrition Facts
USDA BF PATTIES
Calories 204
Total Fat 24%
Saturated 32%
Monounsaturated 7g
Polyunsaturated 1g
Cholesterol 18%
Sodium 3%
Carbohydrates 0%
Dietary Fiber 0%
Sugars 0g
Protein 29%


PLAYER 1
Round: 2/2
Wins: 0
Property: 1
Assets:
$100k
CURRENT CHALLENGE
Highest: Dietary Fiber
Lowest: Total Fat
PLAYER 2
Round:2/2
Wins: 0
Property: 1
Assets:
$200k
Nutrition Facts
GRILLD CHS
Calories 493
Total Fat 37%
Saturated 30%
Monounsaturated 5g
Polyunsaturated 11g
Cholesterol 1%
Sodium 38%
Carbohydrates 21%
Dietary Fiber 5%
Sugars 13g
Protein 16%
Nutrition Facts
BOYSENBERRIES
Calories 88
Total Fat 0%
Saturated 0%
Monounsaturated 0g
Polyunsaturated 0g
Cholesterol 0%
Sodium 0%
Carbohydrates 7%
Dietary Fiber 10%
Sugars 0g
Protein 2%
Nutrition Facts
BEEF RND FULL
Calories 235
Total Fat 20%
Saturated 24%
Monounsaturated 6g
Polyunsaturated 1g
Cholesterol 26%
Sodium 3%
Carbohydrates 0%
Dietary Fiber 0%
Sugars 0g
Protein 55%
Nutrition Facts
CHICK GUMBO
Calories 48
Total Fat 1%
Saturated 2%
Monounsaturated 0g
Polyunsaturated 0g
Cholesterol 1%
Sodium 29%
Carbohydrates 3%
Dietary Fiber 3%
Sugars 2g
Protein 3%
Nutrition Facts
CHICK BRST
Calories 109
Total Fat 2%
Saturated 2%
Monounsaturated 1g
Polyunsaturated 0g
Cholesterol 18%
Sodium 60%
Carbohydrates 1%
Dietary Fiber 0%
Sugars 4g
Protein 40%


CYT_SuppData4
Dendritic Cell
Present
146-CD8
Data Value
5.61
tSNE Viewer
A/D to Scroll

Resources

1. Hensel, N. (Ed.). (2012). *Characteristics of Excellence in Undergraduate Research*. Washington, DC: The Council on Undergraduate Research. Retrieved from: http://www.cur.org/assets/1/23/COEUR_final.pdf
2. Karukstis, K.K. & Elgren, T.E. (2007). Developing and sustaining a research-supportive curriculum: A compendium of successful practices. Washington, DC: The Council on Undergraduate Research.
3. Karukstis, K. K. & Hensel, N. (Eds.). (2010). *Transformative Research at Predominately Undergraduate Institutions*. Washington, DC: The Council on Undergraduate Research. Retrieved from: http://www.cur.org/assets/1/7/TRFull.pdf

References

- Barrows, H.S. & Tamblyn, R.M. (1980). *Problem-based learning: An approach to medical education*. New York, NY: Springer.
- Boyer Commission on Educating Undergraduates in the Research University. (1998). *Reinventing Undergraduate Education: A blueprint for America's universities*. Stony Brook, NY.
- Chubin, D.E. and Ward, W.E. (2009). "Building on the VEST principles and evidence: A framework for broadening participation." In Boyd and Wesemann, 2009, 20-30.
- Kinkead, J. & Blockus, J. (2012). Undergraduate research offices & programs: Models and practices. Washington,D.C.: Council on Undergraduate Research.
- Kuh, G.D. (2008). High-impact educational practices: What they are, who has access to them, and why they matter. Washington, D.C.: AAC&U.