The Game Education Matrix (GEM) Beta

Facilitating Pathways in Post-Secondary Games Education

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Presentation Agenda

1. Description and Purpose of the GEM
2. Conceptual and Theoretical Underpinnings
3. How GEM Works (input and output)
4. Goals of the Beta
5. Beta Updates
6. Articulation Wizard (Andrew)
7. Challenges and Limitations

What is the GEM?

- The Game Education Matrix was designed by Jean Bridge (Brock) and a multi-institutional team to help facilitate student transfer and articulation agreements among games programs in Ontario.
- Through an online tool, users provide data for their program and core courses by selecting from a pre-defined database of competencies and Learning Outcomes (LOs) related to games education.

Brock University

GEM GAME EDUCATION MATRIX

ONCAT

Logged in as
Brock User
LOGOUT

The Game Education Matrix enables Ontario Colleges and Universities to compare game-related programs for the purpose of developing new transfer pathways. Participating institutions demonstrate the emphasis, specialization and depth of their programs through the identification of the competencies and learning outcomes. This information supports more seamless transfer for students.

MORE ABOUT THE GEM TOOL

Participating Institutions

McMaster University
UOIT
Algonquin College
University of Windsor
Carleton University
Durham College
Humber
Niagara College
York University
Brock University
Western
Fanshawe

Why GEM?

- There are roughly 30* games and interactive media programs in the province, each with their own specializations (e.g. programming, 3D modelling, animation, design).
- How do we get them to “talk” to each other?

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The problem

Programs make and study games

Making Games requires

- Art
- Sound
- Narrative
- Programming
- Design
- Project management
- Documentation

Studying Games requires

- History
- Ludology
- Critical theory
- Rhetoric
- Semiotics
- Gender studies
- Aesthetics

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To make matters worse, each program uses its own **language** to describe its outcomes.

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How do we handle this diversity in terms of **transfer** when each program is unique?

- We look for all possible competencies and learning outcomes related to games and put them into a database. Individual programs can then tell us which outcomes they achieve, and which they don’t.
- The database becomes a Rosetta Stone of sorts.

Some Conceptual Underpinnings

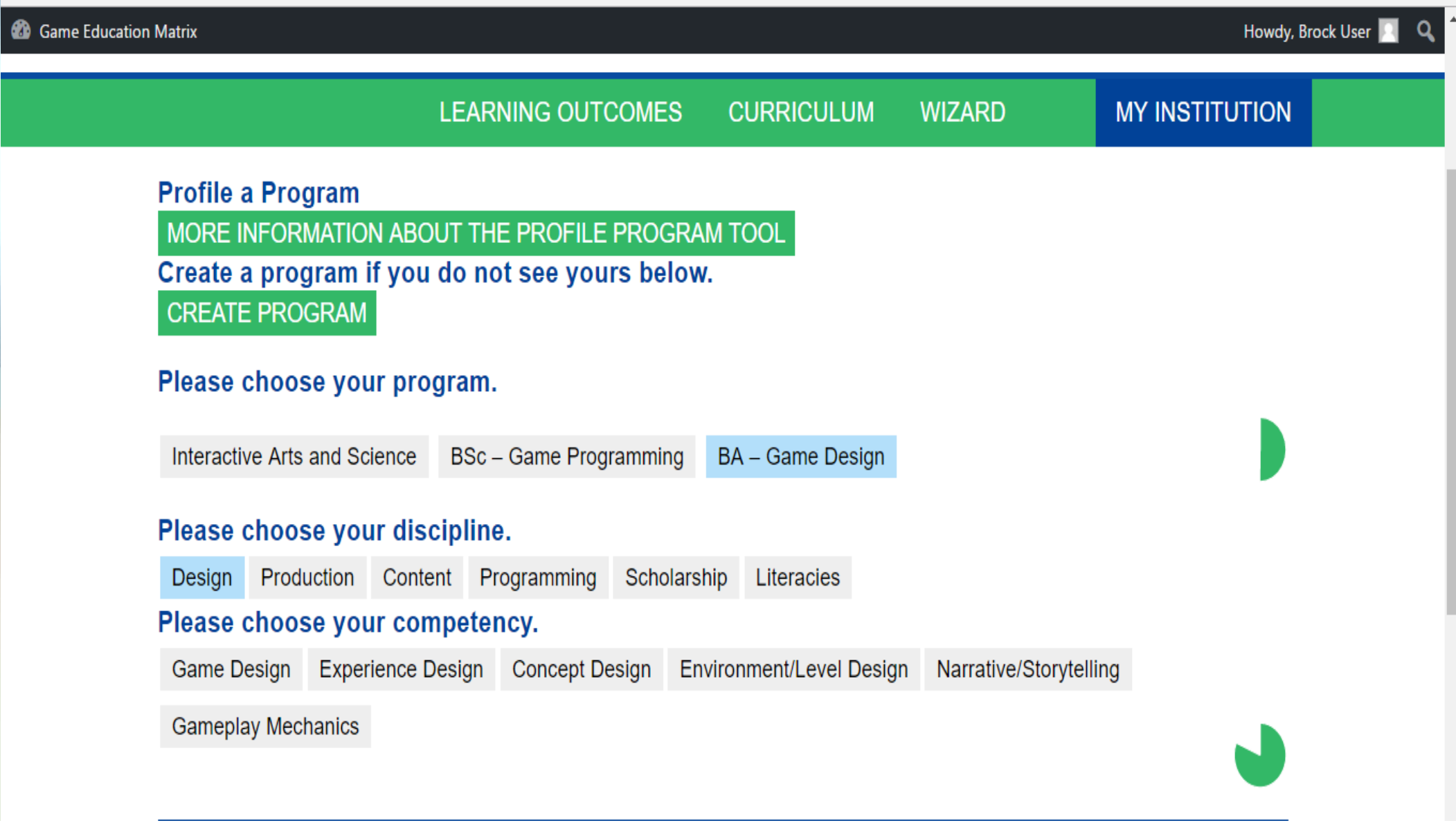
- Learning Outcome Statements (Bologna Process; Fitzgibbon, 2014). Credits can be transferred based on shared LOs rather than instructional hours or other metrics.
- Competency Tuning: a “faculty-led process to develop common frameworks for disciplinary fields” (GEM Prototype Final Report, 2014).
- Taxonomies, especially Biggs’ SOLO (Structure of Observed Learning Outcomes) Taxonomy, which tracks the progression of learning from simple to increasingly complex/abstract.

The Matrix

Through consultations with faculty and industry, the GEM team discovered **5 core Disciplines**: Design, Production, Content, Programming, Scholarship, plus Literacies

The Matrix

Each **Discipline** contains a number of competencies related to it. For instance, within the **Design** competency, there is Game Design, Experience Design, and Concept Design

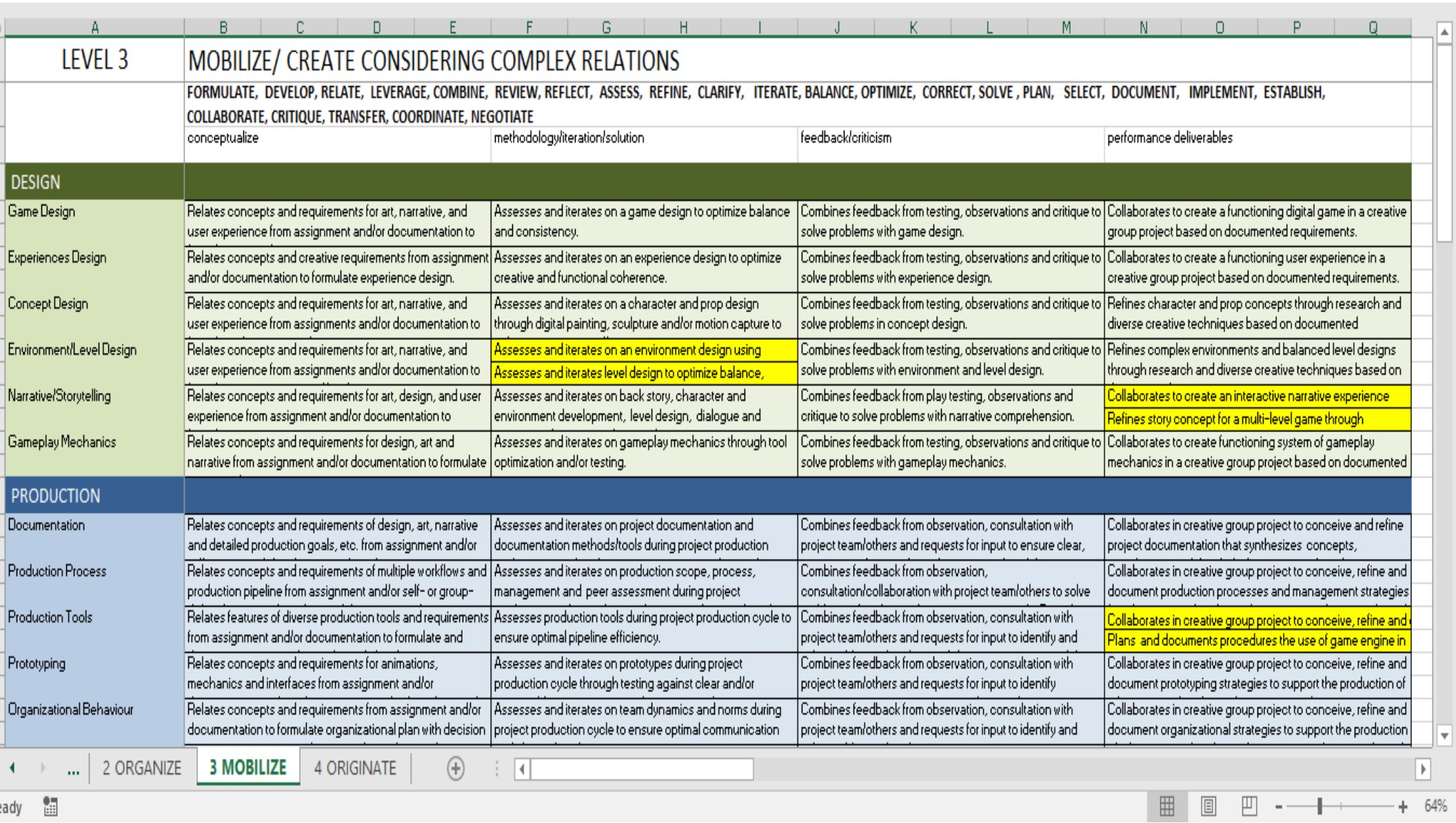

Game Education Matrix
Howdy, Brock User
LEARNING OUTCOMES
CURRICULUM
WIZARD
MY INSTITUTION
Profile a Program
MORE INFORMATION ABOUT THE PROFILE PROGRAM TOOL
Create a program if you do not see yours below.
CREATE PROGRAM
Please choose your program.
Interactive Arts and Science
BSc – Game Programming
BA – Game Design
Please choose your discipline.
Design
Production
Content
Programming
Scholarship
Literacies
Please choose your competency.
Game Design
Experience Design
Concept Design
Environment/Level Design
Narrative/Storytelling
Gameplay Mechanics

The Matrix

Each **Competency** contains **Learning Outcomes** related to it according to 4 levels of complexity. The program must fulfill a certain number of LOs to move on to the next level.

4 Levels of Competency

1. Discuss/Use (definitions, vocabulary, exploration…)
2. Organize (manipulate, differentiate, contextualize…)
3. Mobilize/Create (formulate, assess, correct…)
4. Originate/Judge (invent, propose, expand, systematize…)



LEVEL 3	MOBILIZE/ CREATE CONSIDERING COMPLEX RELATIONS			
	FORMULATE, DEVELOP, RELATE, LEVERAGE, COMBINE, REVIEW, REFLECT, ASSESS, REFINE, CLARIFY, ITERATE, BALANCE, OPTIMIZE, CORRECT, SOLVE , PLAN, SELECT, DOCUMENT, IMPLEMENT, ESTABLISH, COLLABORATE, CRITIQUE, TRANSFER, COORDINATE, NEGOTIATE			
	conceptualize	methodology/iteration/solution	feedback/criticism	performance deliverables
DESIGN				
Game Design	Relates concepts and requirements for art, narrative, and user experience from assignment and/or documentation to	Assesses and iterates on a game design to optimize balance and consistency.	Combines feedback from testing, observations and critique to solve problems with game design.	Collaborates to create a functioning digital game in a creative group project based on documented requirements.
Experiences Design	Relates concepts and creative requirements from assignment and/or documentation to formulate experience design.	Assesses and iterates on an experience design to optimize creative and functional coherence.	Combines feedback from testing, observations and critique to solve problems with experience design.	Collaborates to create a functioning user experience in a creative group project based on documented requirements.
Concept Design	Relates concepts and requirements for art, narrative, and user experience from assignments and/or documentation to	Assesses and iterates on a character and prop design through digital painting, sculpture and/or motion capture to	Combines feedback from testing, observations and critique to solve problems in concept design.	Refines character and prop concepts through research and diverse creative techniques based on documented
Environment/Level Design	Relates concepts and requirements for art, narrative, and user experience from assignments and/or documentation to	Assesses and iterates on an environment design using Assesses and iterates level design to optimize balance,	Combines feedback from testing, observations and critique to solve problems with environment and level design.	Refines complex environments and balanced level designs through research and diverse creative techniques based on
Narrative/Storytelling	Relates concepts and requirements for art, design, and user experience from assignment and/or documentation to	Assesses and iterates on back story, character and environment development, level design, dialogue and	Combines feedback from play testing, observations and critique to solve problems with narrative comprehension.	Collaborates to create an interactive narrative experience Refines story concept for a multi-level game through
Gameplay Mechanics	Relates concepts and requirements for design, art and narrative from assignment and/or documentation to formulate	Assesses and iterates on gameplay mechanics through tool optimization and/or testing.	Combines feedback from testing, observations and critique to solve problems with gameplay mechanics.	Collaborates to create functioning system of gameplay mechanics in a creative group project based on documented
PRODUCTION				
Documentation	Relates concepts and requirements of design, art, narrative and detailed production goals, etc. from assignment and/or	Assesses and iterates on project documentation and documentation methods/tools during project production	Combines feedback from observation, consultation with project team/others and requests for input to ensure clear,	Collaborates in creative group project to conceive and refine project documentation that synthesizes concepts,
Production Process	Relates concepts and requirements of multiple workflows and production pipeline from assignment and/or self- or group-	Assesses and iterates on production scope, process, management and peer assessment during project	Combines feedback from observation, consultation/collaboration with project team/others to solve	Collaborates in creative group project to conceive, refine and document production processes and management strategies
Production Tools	Relates features of diverse production tools and requirements from assignment and/or documentation to formulate and	Assesses production tools during project production cycle to ensure optimal pipeline efficiency.	Combines feedback from observation, consultation with project team/others and requests for input to identify and	Collaborates in creative group project to conceive, refine and Plans and documents procedures the use of game engine in
Prototyping	Relates concepts and requirements for animations, mechanics and interfaces from assignment and/or	Assesses and iterates on prototypes during project production cycle through testing against clear and/or	Combines feedback from observation, consultation with project team/others and requests for input to identify	Collaborates in creative group project to conceive, refine and document prototyping strategies to support the production of
Organizational Behaviour	Relates concepts and requirements from assignment and/or documentation to formulate organizational plan with decision	Assesses and iterates on team dynamics and norms during project production cycle to ensure optimal communication	Combines feedback from observation, consultation with project team/others and requests for input to identify and	Collaborates in creative group project to conceive, refine and document organizational strategies to support the production

DISCUSS/USE - DESIGN - GAME DESIGN

Please select which LOs apply to your program.

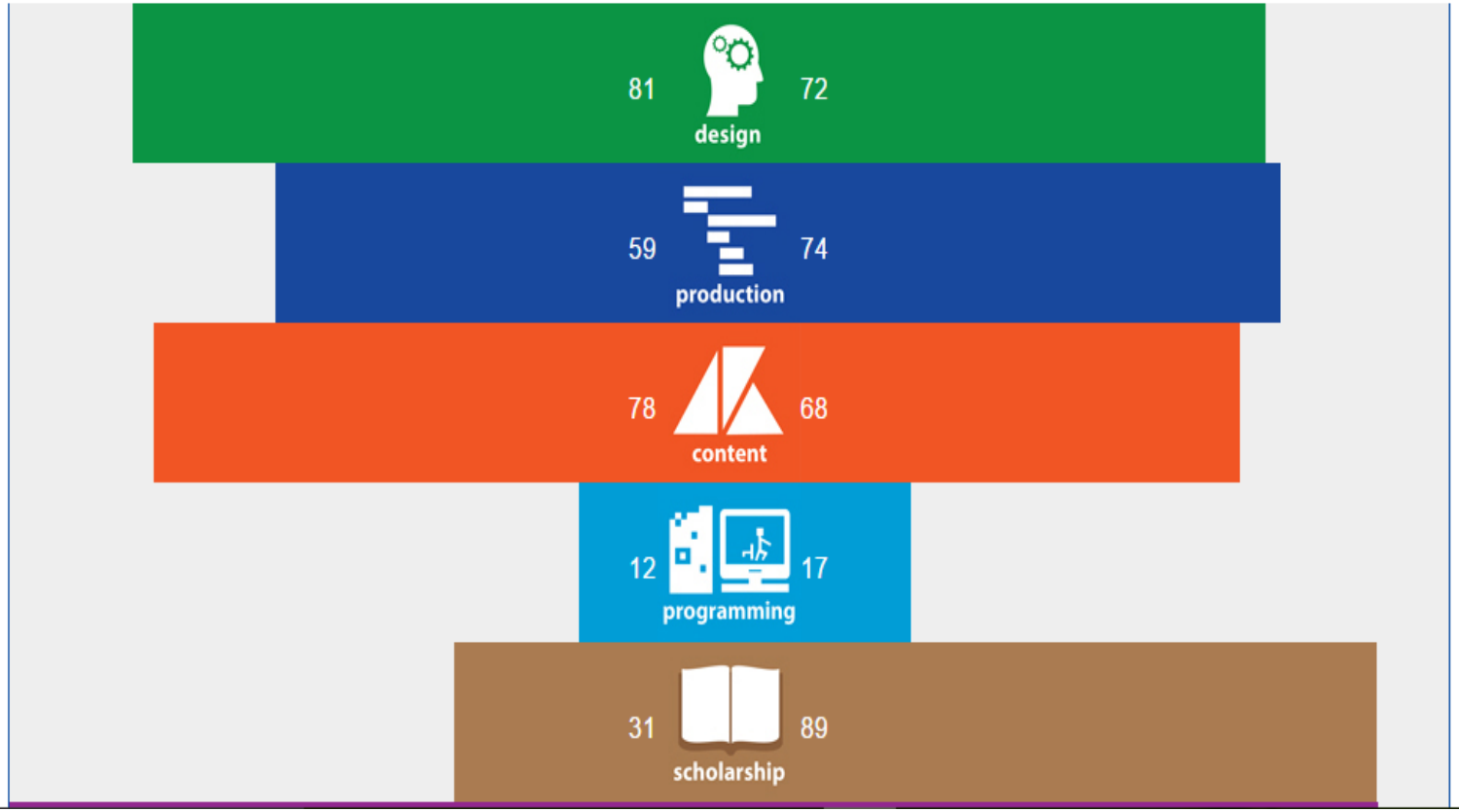
- [ ] I. Defines key concepts, vocabulary and frames of reference to participate in meaningful discussion about digital media/game design.
- [ ] II. Identifies and explores primary topics and precedents in game design through case studies, readings and standard texts.
- [ ] III. Adopts paper or multimedia techniques to prototype ideas.
- [ ] IV. Derives board games and other paper-based game experiments from idea brainstorming and/or research.

This program does not address this competency.

SUBMIT

Game Development at Durham
Durham College

BA – Game Design
Brock University



GEM GAME EDUCATION MATRIX

Goals of the Beta Phase

Goals of the Beta Phase

1. Better understand the audience and field (consult)
2. Cut down on the sheer amount of LOs (responsibly)
3. Make the profiling process more user-friendly
4. Expand the pool of profiled programs
5. Add functionality (automation, output reports)
6. Develop 2 articulation agreements

Who are the end users of the GEM?

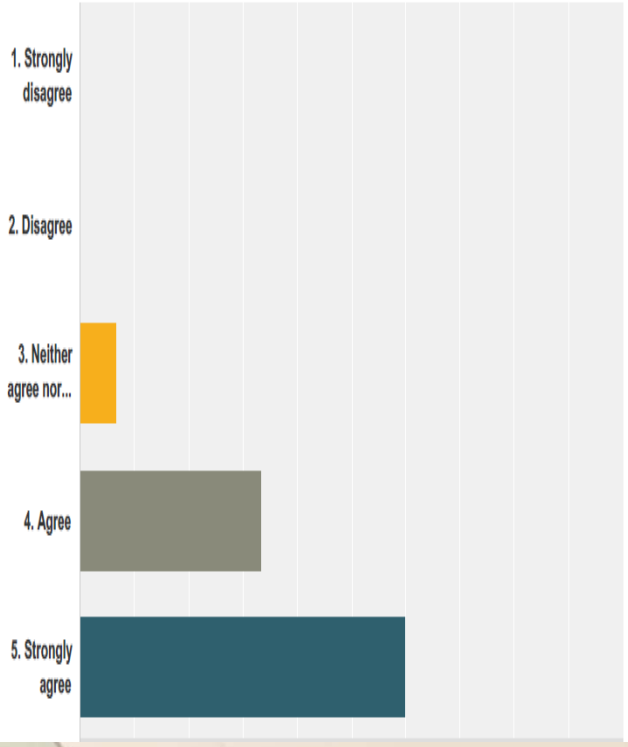
1. Faculty. Most articulation agreements and transfer protocols start with faculty (depending on institution).
2. Registrars and admissions personnel. They want easy to read data on the exiting program. Transfer tends to happen on an ad-hoc, case-by-case basis.
3. Students (eventually). The GEM could aid students looking at transfer options.

What does the industry want (n=15)?

- A credential (university slightly preferred to college)
- A portfolio
- Strong communication and interpersonal skills

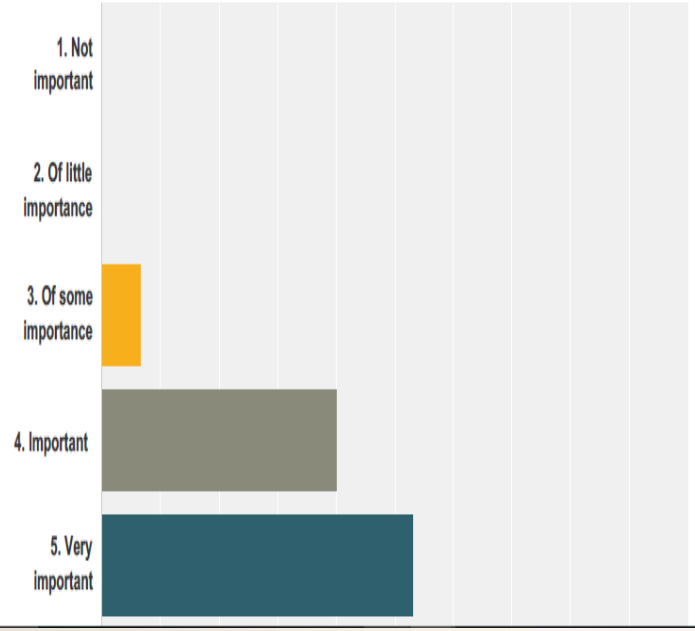
Q16 On a scale of 1 (Strongly Disagree) to 5 (Strongly Agree), how well does the following statement describe you: "I believe soft skills are equally as important as technical skills"

Answered: 15 Skipped: 0



Q17 On a scale of 1 (Not Important) to 5 (Very Important), please rate how important you find EFFECTIVE COMMUNICATION WITH COLLEAGUES, MANAGERS AND DEPARTMENT HEADS to be when assessing job applicants based on their resume or during the interview process.

Answered: 15 Skipped: 0



Beta Updates (Apr. 2016 - Feb. 2018)

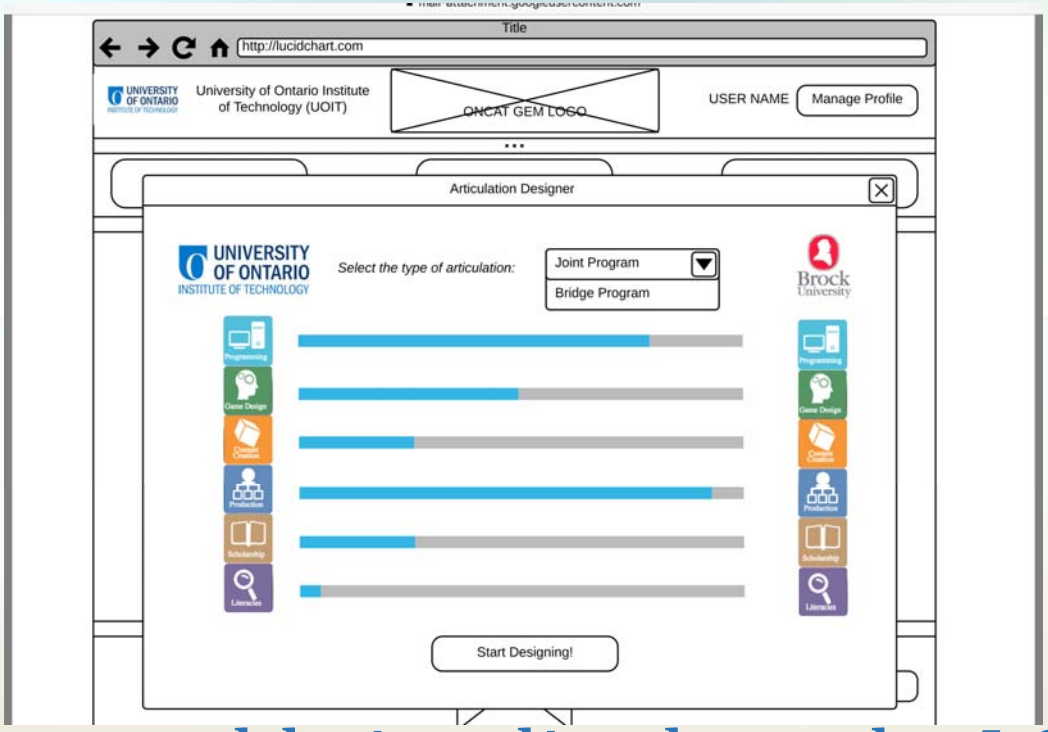
- The project team consists of members from 6 institutions: Algonquin College, Brock University, Durham College, Niagara College, UOIT, York University
- We mostly kept the conceptual framework with a few tweaks
- We cut down on the LOs based on redundancy and competencies not profiled in the Prototype phase (e.g. Rhetoric)
- Consulted with a UX/UI professor to improve the UX
- We doubled the pool of profiled programs (agreed)
- Added new functionality, e.g. the Articulation Wizard

GEM Wizard

Problem

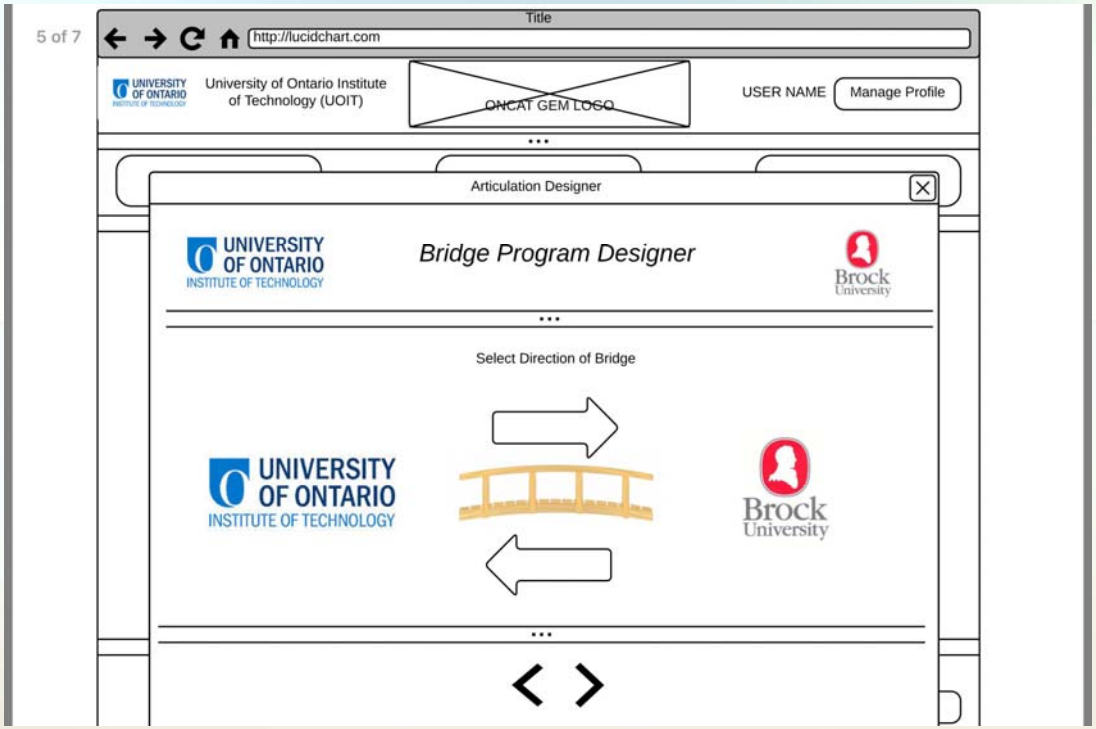
- Program directors have a hard time understanding how students from another institution should integrate into their program
- GEM helps by mapping each program through learning outcomes (LOs).
- How do we use these LOs practically?

Design of a wizard



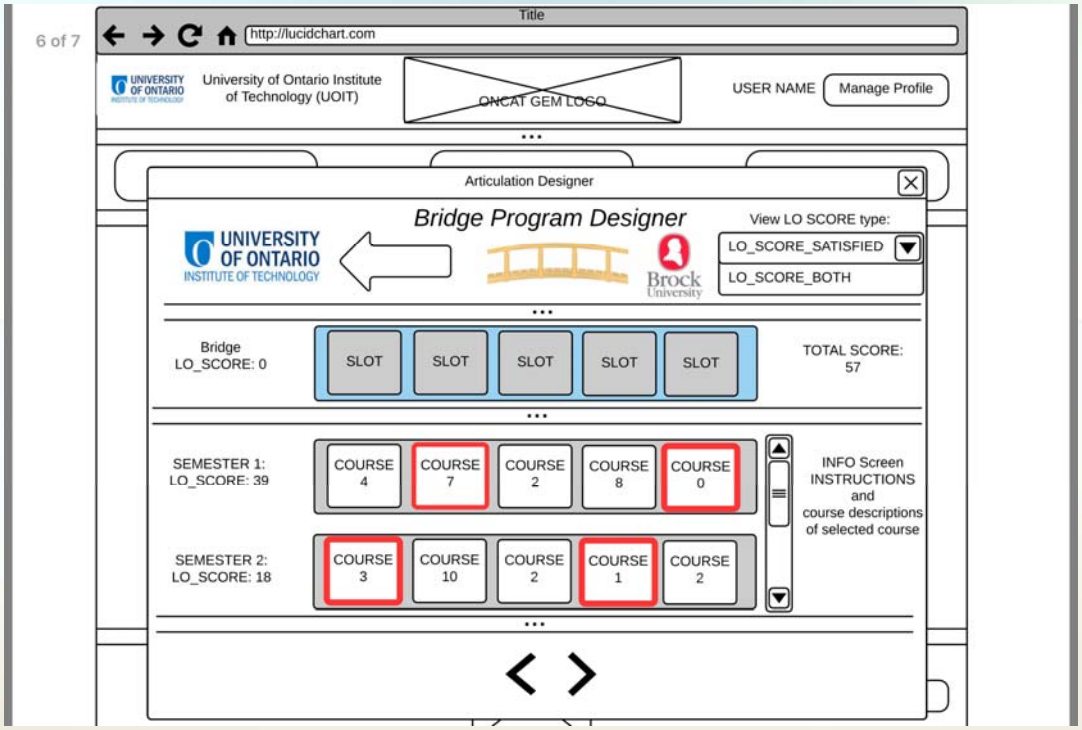
What if we could visualize how the LOs from two programs map to each other?

We could see if the programs are compatible and identify "holes" that need to be filled



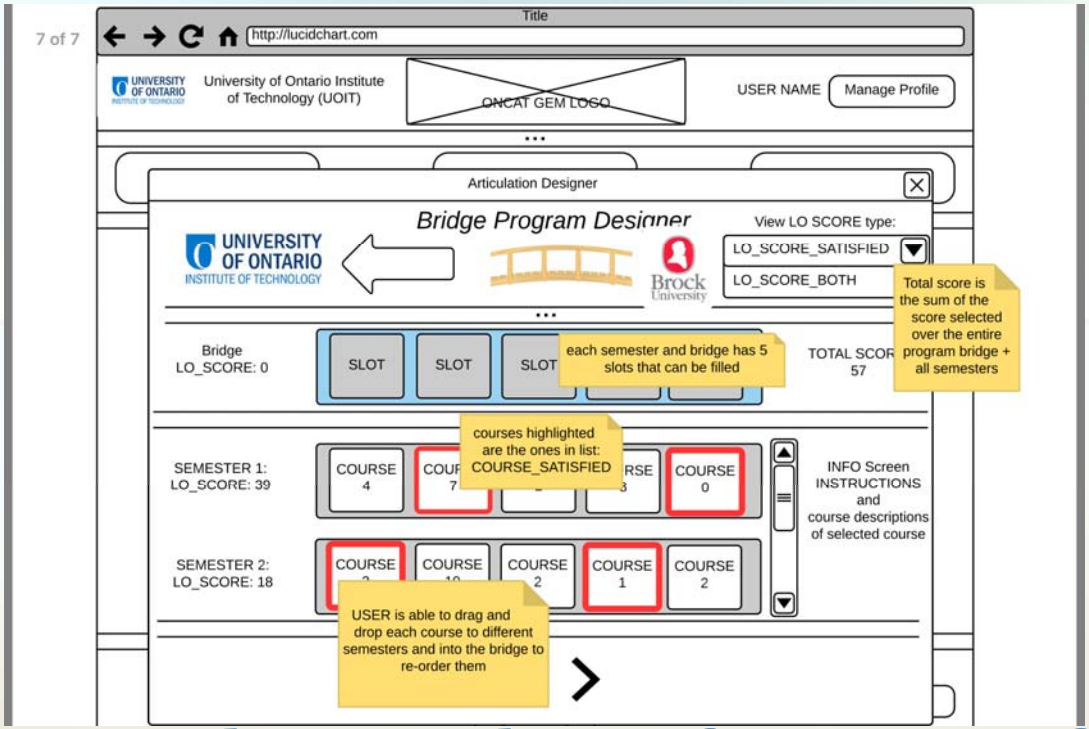
Imagine a simple interface like a wizard that guides program directors through the creation of a bridge

Using the LO data from GEM



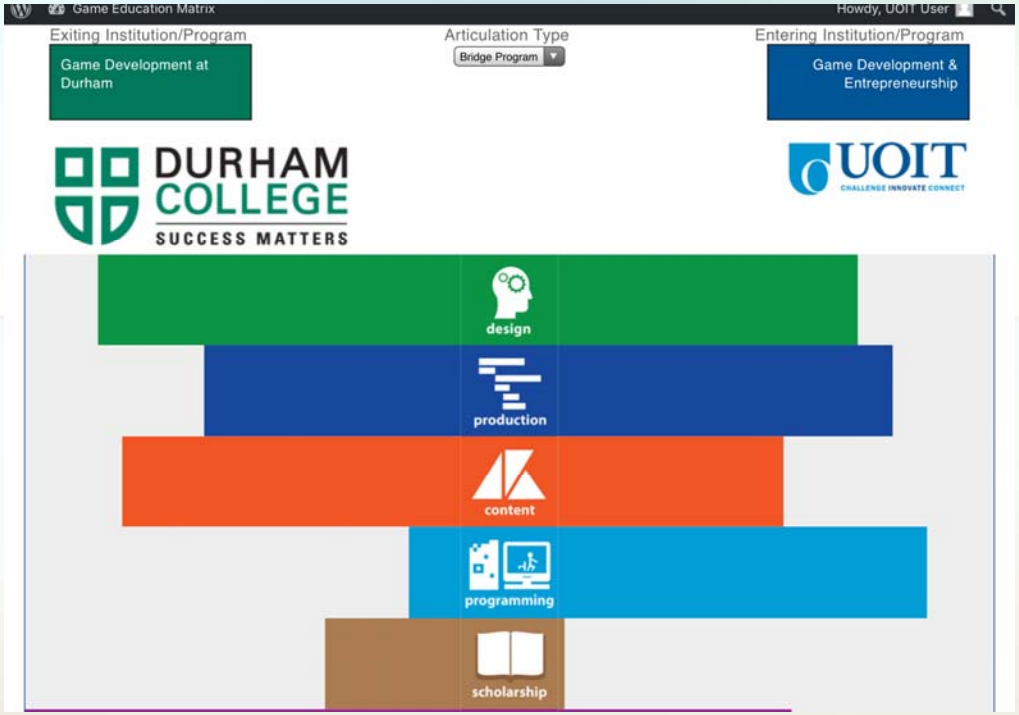
Imagine an interface that lets you drag and drop courses to create a program map

Allows for easy use and maintenance of individualized program maps for bridge students



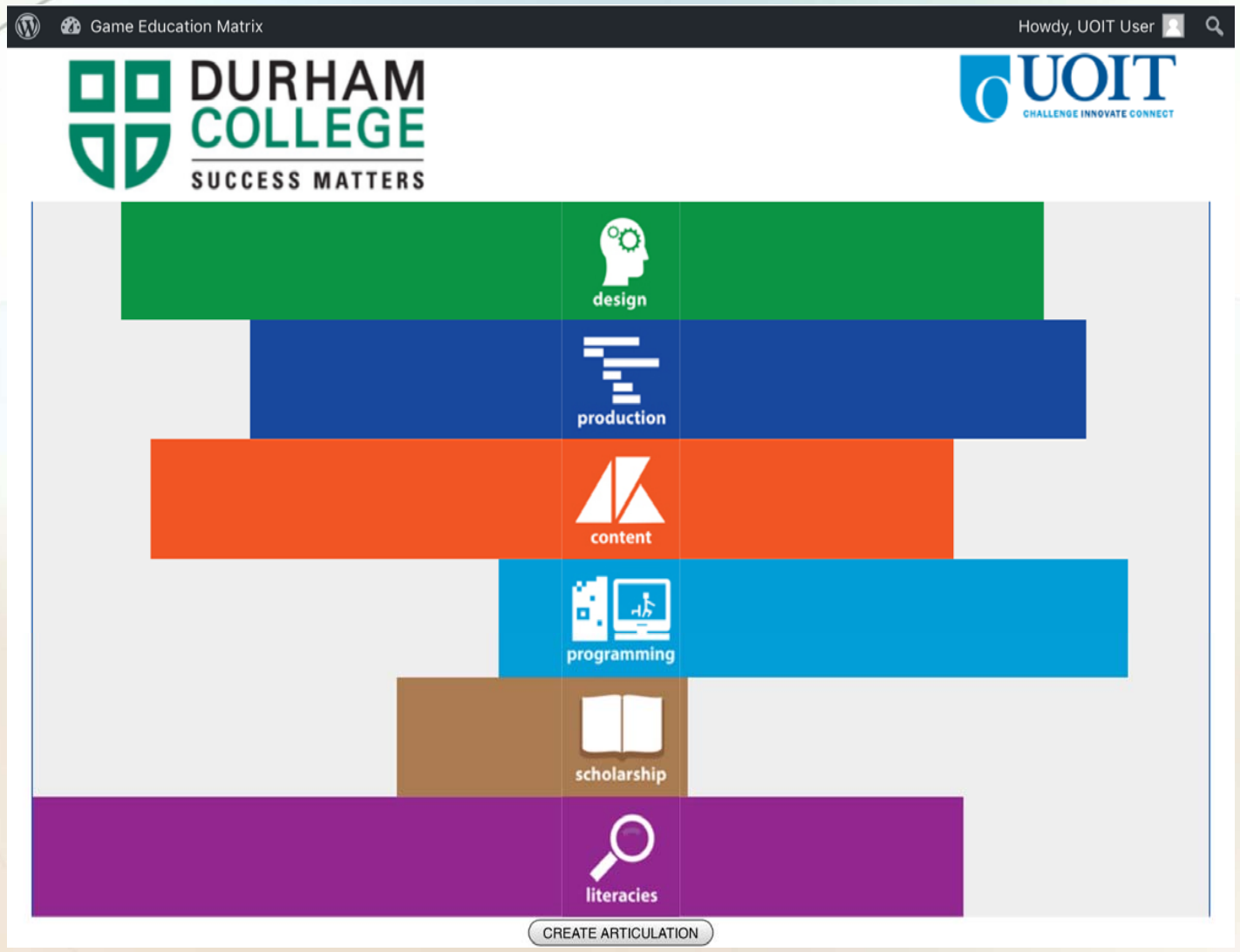
LO_SCORE is the number of LOs satisfied by the students exiting program

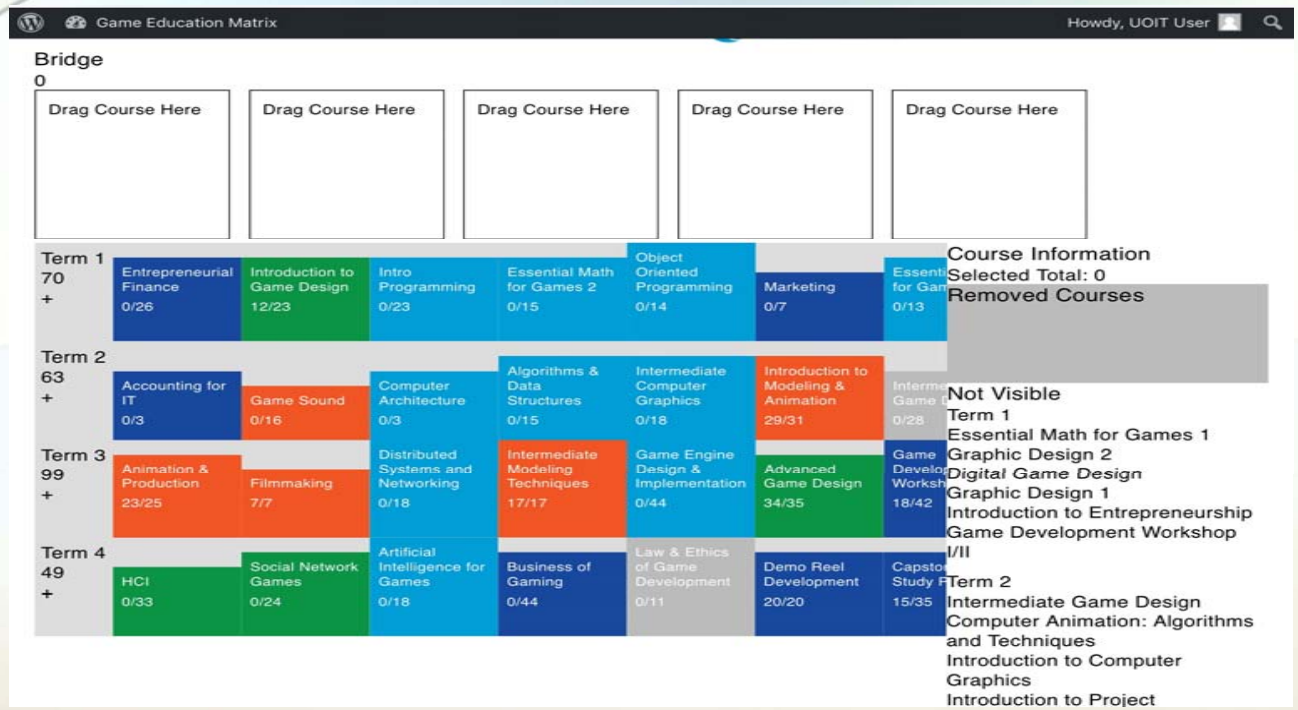
Lower # means better candidate for inclusion
Higher # means student has already satisfied many LOs



Select 2 programs to see how they map at a high level across disciplines

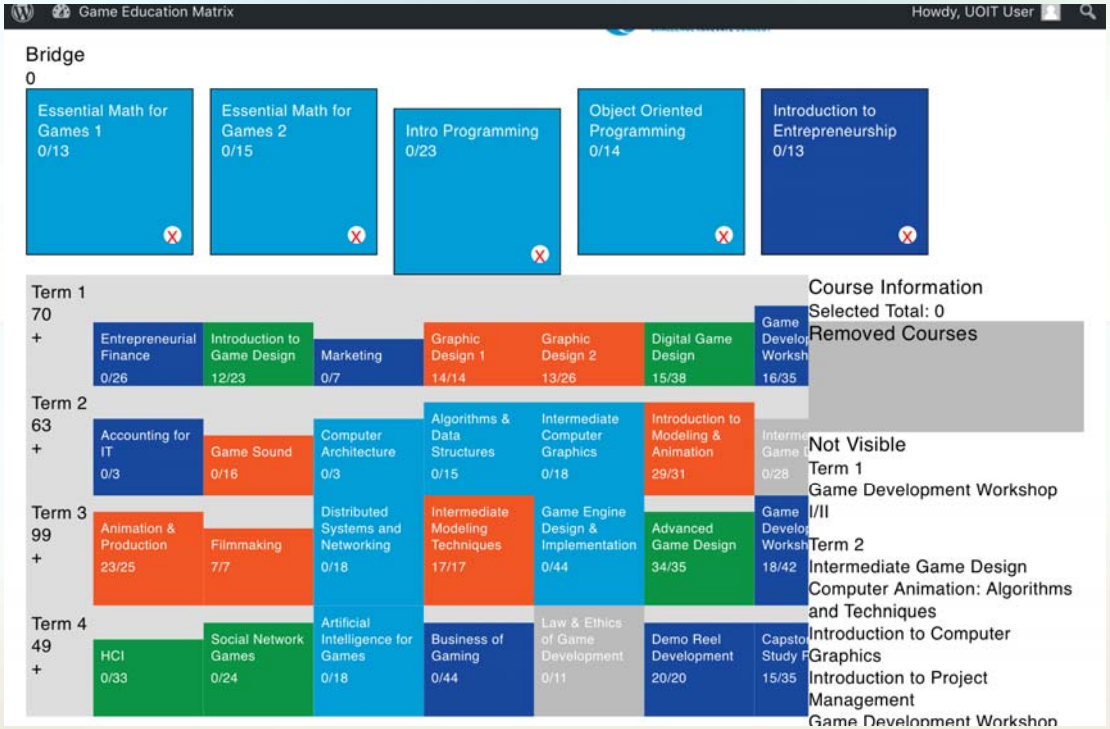
For this example I have selected a student who has completed DC's game dev program and is entering UOIT's game dev program


Game Education Matrix
Howdy, UOIT User
DURHAM COLLEGE
SUCCESS MATTERS
UOIT
CHALLENGE INNOVATE CONNECT
design
production
content
programming
scholarship
literacies
CREATE ARTICULATION

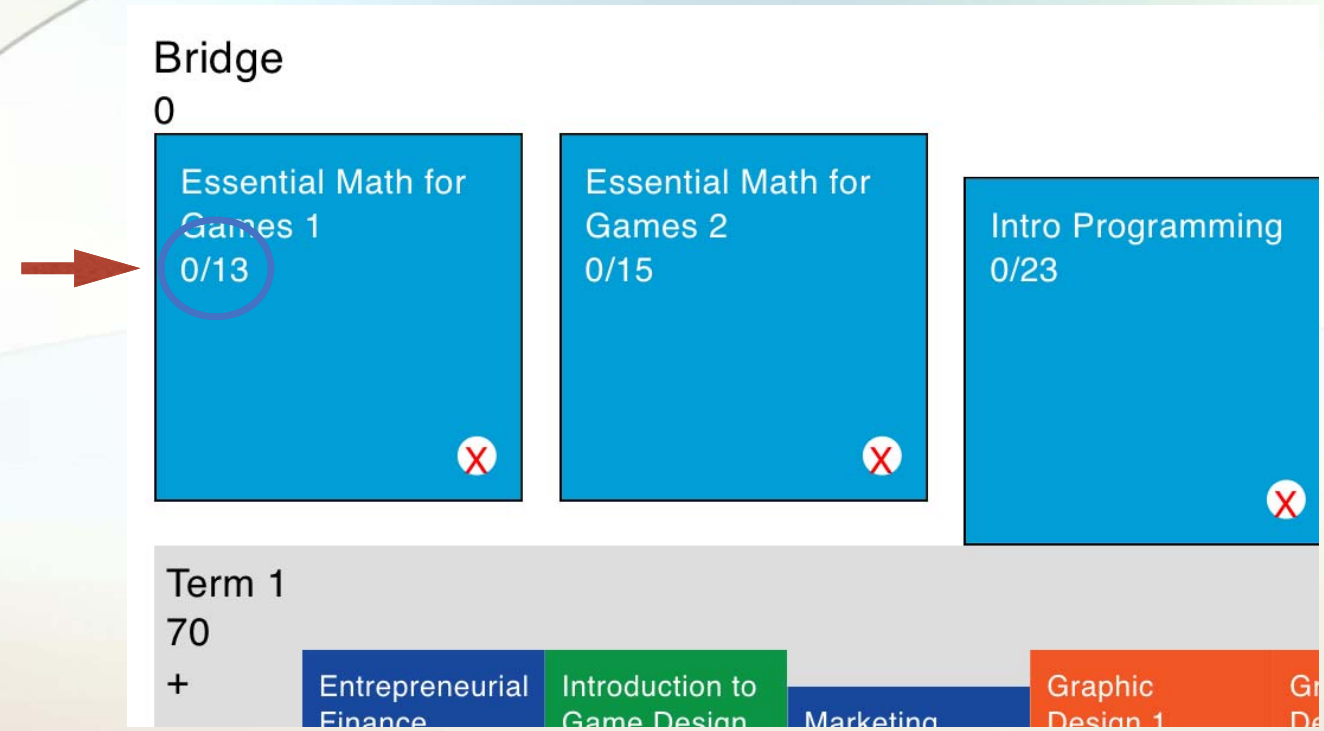


Courses can be rearranged and dragged to create the bridge

Shows how many LOs each course satisfies and how many of those LOs have already been satisfied through DC



Identified best candidates for the bridge because DC didn't satisfy the LOs for these core courses



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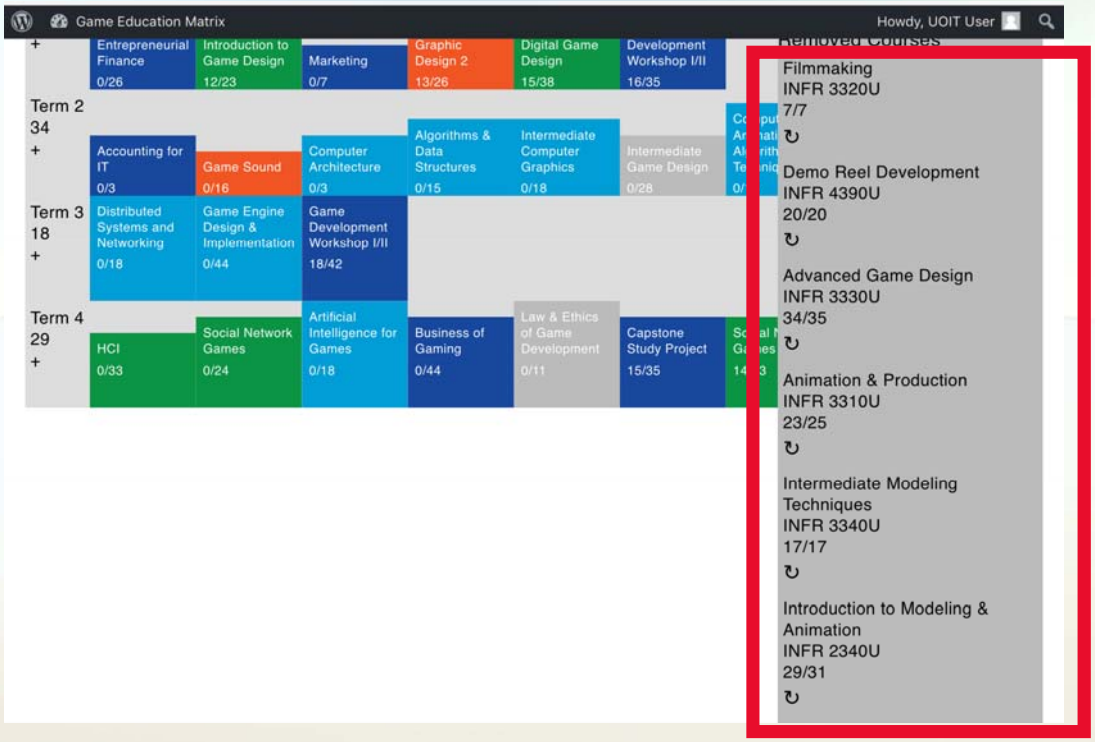
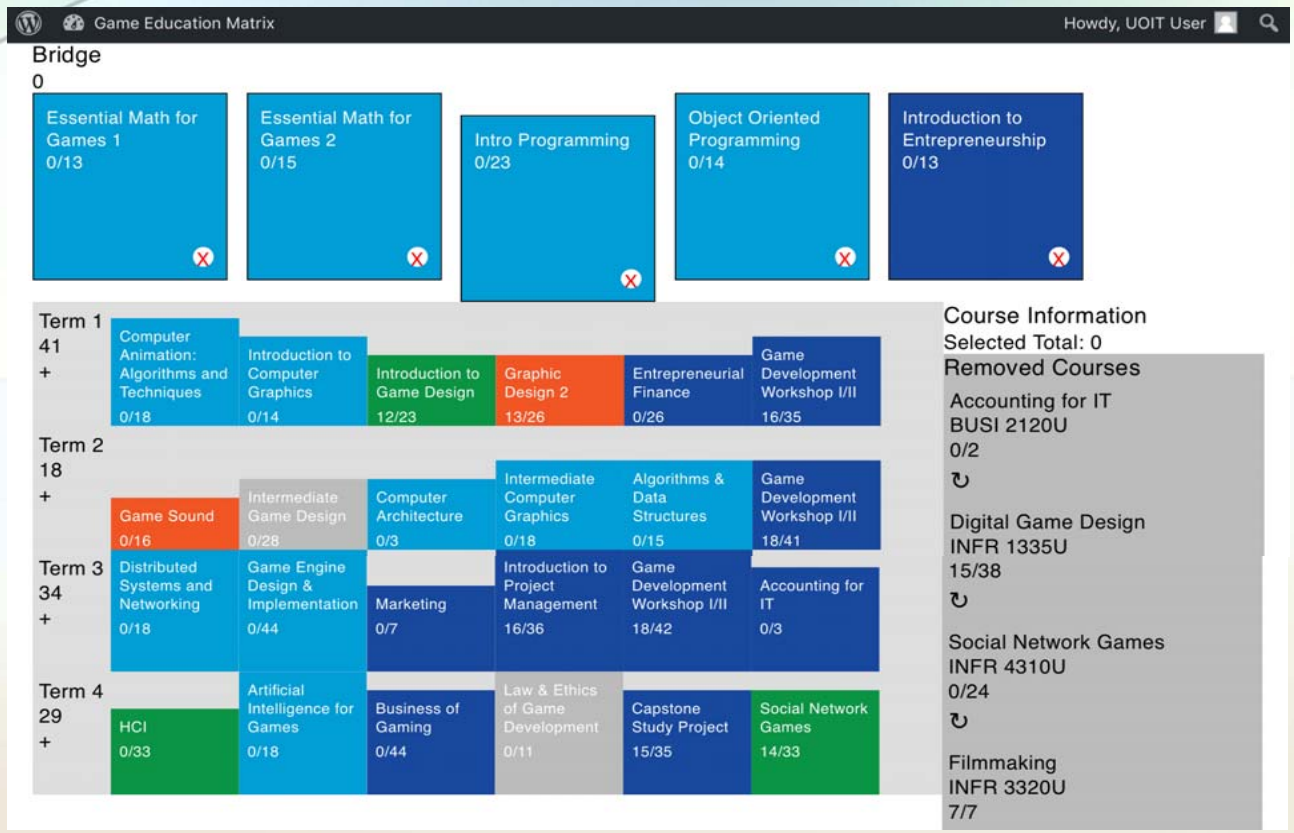


Removed courses that DC satisfied most of the LOs

DCs program is art heavy so it makes sense that the art courses are identified to be removed



The final individualized bridge program

Can be emailed and saved for later editing

Wizard thoughts

- Gives program directors the data needed to make decisions on course removal based on LEARNING OUTCOMES rather than course names
- Removes ambiguity
- If a course is removed that still has remaining LOs, e.g. DC Course has satisfied 20/25 LOs of a UOIT course you can identify WHICH LOs.
- Opportunity to create individualized online modules for the student to take.

Still just an idea…

- Curriculum maps are a pain to complete.
- The GEM can be a pain to complete.
- What if we could use GEM data to generate curriculum maps based on provincial standards (e.g. DLEs)?
- We've developed a proof of concept but it's still in the early stages.

Challenges and Limitations of the GEM

- A model based on LOs is inherently limiting.
- A tool requires rigid quantification; learning is messier than that.
- Methods and standards of assessment vary.
- Profiler reliability.
- The tool requires a lot of time and monotonous work.

Thank you!

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Bibliography

Biggs, J. (1982). Evaluating the quality of learning: The SOLO taxonomy (Structure of the Observed Learning Outcome). New York: Academic Press.

FitzGibbon, J. (2014). Learning outcomes and credit transfer: Examples, issues and possibilities. *British Columbia council on articulation and transfer special report*. http://www.bccat.ca/pubs/Learning_Outcomes_and_Credit_Transfer_Feb2014.pdf