



Encouraging engagement in large and extra, extra large games courses

**Sean Gouglas**  
University of Alberta

GAME DEVELOPERS CONFERENCE®  
MOSCONE CENTER · SAN FRANCISCO, CA  
MARCH 2-6, 2015 · EXPO: MARCH 4-6, 2015



# Understanding Video Games

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UNIVERSITY OF ALBERTA

Understanding Video Games

by Leah Hackman, Sean Gouglas

UUG

UNDERSTANDING VIDEO GAMES

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Understanding Video Games: Week One

Greetings UVG students and welcome to the [University of Alberta's](#) first offering of this course.

As of this weekend we have well over 10,000 students registered and I am sure this number will increase in the coming weeks. Let your friends and fellow gaming enthusiasts know, as they can jump in at any time during the duration of this 11-week course. We have been talking for a while about running a MOOC about understanding video games given the breadth and depth of knowledge and expertise we have here at UAlberta, so we are excited to get underway. UAlberta already offers a [Certificate in Computer Game Development](#), which we are very proud of, so we believe the UVG MOOC is a great way to share more of our expertise with the world. We have an incredible range of topics and material to cover, and I hope that this course gives you a better understanding of video games in society today.

I will be sending out a weekly letter about the upcoming topic, as well as drawing attention to interesting things that may be happening on our campus in that area, or highlighting some of the amazing things that our students and faculty associated with video games are doing. Speaking of UAlberta students, I would like to take this opportunity to introduce you to our two teaching assistants who will be handling a lot of your work and managing the online discussion forums during this course.

Sandra Sawchuk and David Holmes are both UAlberta Master's students with particular interest and expertise in video games. Sandra is pursuing her Masters in Arts (Humanities Computing) as well as her Masters in Library and

We've just described some of *Colonization's* race-based game mechanics. These mechanics are used to...

A) Give the player a be  
sense of immersion

B) Give the player differ  
play style opportuni

C) Create moments fo  
emergent gamepla

D) Influence the game  
narrative setting

E) All of the above

MDA (21:55)

Help Center

Sex as Mechanic (24:52)

Help

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# Existing Expertise

RESEARCHARTICLES

Checkers Is Solved

Jonathan Schaeffer,\* Neil Burch, Yngvi Björnsson,† Akihiro Kishimoto,‡ Martin Müller, Robert Lake, Paul Lu, Steve Sutphen

The game of checkers has roughly 500 billion billion possible positions ( $5 \times 10^{20}$ ). The task of solving the game, determining the final result in a game with no mistakes made by either player, is daunting. Since 1989, almost continuously, dozens of computers have been working on solving checkers, applying state-of-the-art artificial intelligence techniques to the proving process. This paper announces that checkers is now solved: Perfect play by both sides leads to a draw. This is the most challenging popular game to be solved to date, roughly one million times as complex as Connect Four. Artificial intelligence technology has been used to generate strong heuristic-based game-playing programs, such as Deep Blue for chess. Solving a game takes this to the next level by replacing the heuristics with perfection.

Since Claude Shannon's seminal paper on the structure of a chess-playing program in 1950 (1), artificial intelligence researchers have developed programs capable of challenging and defeating the strongest human players in the world. Superhuman-strength programs exist for popular games such as chess [Deep Fritz (2)], checkers [Chinook (3)], Othello [Logistello (4)], and Scrabble [Maven (5)]. However strong these programs are, they are not perfect. Perfection implies solving a game—determining the final result (game-theoretic value) when neither player makes a mistake. There are three levels of solving a game (6). For the lowest level, ultraweakly solved, the perfect-play result, but not a strategy for achieving that value, is known [e.g., in Hex the first player wins, but for large board sizes the winning strategy is not known (7)]. For weakly solved games, both the result and a strategy for achieving it from the start of the game are known [e.g., in Go Moku the first player wins and a program can demonstrate the win (6)]. Strongly solved games have the result computed for all possible positions that can arise in the game [e.g., Awari (8)].

Checkers ( $8 \times 8$  draughts) is a popular game enjoyed by millions of people worldwide, with many annual tournaments and a series of competitions that determine the world champion. There are numerous variants of the game played around the world. The game that is popular in North America and the (former) British Commonwealth has pieces (checkers) moving forward one square diagonally, kings moving forward or backward one square diagonally, and a forced-capture rule [see supporting online material (SOM) text].

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‡Present address: Department of Media Architecture, Future University, Hakodate, 116-2 Kamedanukano-cho Hakodate Hokkaido, 041-8655, Japan.

best known is the four-color theorem (9). This deceptively simple conjecture—that given an arbitrary map with countries, you need at most four different colors to guarantee that no two adjoining countries have the same color—has been extremely difficult to prove analytically. In 1976, a computational proof was demonstrated. Despite the convincing result, some mathematicians were skeptical, distrusting proofs that had not been verified using human-derived theorems. Although important components of the checkers proof have been independently verified, there may be skeptics.

This article describes the background behind the effort to solve checkers, the methods used for achieving the result, an argument that the result is correct, and the implications of this research. The computer proof is online (10).

**Background.** The development of a strong checkers program began in the 1950s with Arthur Samuel's pioneering work in machine learning. In 1963, his program played a match against a capable player, winning a single game. This result was heralded as a triumph for the fledgling field of AI. Over time, the result was exaggerated, resulting in claims that checkers was now "solved" (3).

The Chinook project began in 1989 with the goal of building a program capable of challenging the world checkers champion. In 1990, Chinook earned the right to play for the World Championship. In 1992, World Champion Marion Tinsley narrowly defeated Chinook in the title match. In the 1994 rematch, Tinsley withdrew part way due to illness. He passed away eight months later. By 1996 Chinook was much

The effort to solve checkers began in 1989, and the computations needed to achieve that result have been running almost continuously since then. At the peak in 1992, more than 200 processors were devoted to the problem simultaneously. The end result is one of the longest running computations completed to date.

With this paper, we announce that checkers has been weakly solved. From the starting position (Fig. 1, top), we have a computational proof that checkers is a draw. The proof consists of an explicit strategy that never loses—the program can achieve at least a draw against any opponent, playing either the black or white pieces. That checkers is a draw is not a surprise; grandmaster players have conjectured this for decades.

The checkers result pushes the boundary of artificial intelligence (AI). In the early days of AI research, the easiest path to achieving high performance was believed to be emulating the human approach. This was fraught with difficulty, especially the problems of capturing and encoding human knowledge. Human-like strategies are not necessarily the best computational strategies. Perhaps the biggest contribution of applying AI technology to developing game-playing programs was the realization that a search-intensive ("brute-force") approach could produce high-quality performance using minimal application-dependent knowledge. Over the past two decades, powerful search techniques have been developed and successfully applied to problems such as optimization, planning, and bioinformatics. The checkers proof extends this approach by developing a program that has little need for application-dependent knowledge and is almost completely reliant on search. With advanced AI algorithms and improved hardware (faster processors, larger memories, and larger disks), it has become possible to push the limits on the type and size of problems that can be solved. Even so, the checkers search space ( $5 \times 10^{20}$ ) represents a daunting challenge for today's technology.

Computer proofs in areas other than games have been done numerous times. Perhaps the



**Fig. 1. Black to play and draw. (Top)** Standard starting board. **(Bottom)** Square numbers used for move notation.

RESEARCH

RESEARCH ARTICLE

COMPUTER SCIENCE

Heads-up limit hold'em poker is solved

Michael Bowling,<sup>1\*</sup> Neil Burch,<sup>1</sup> Michael Johanson,<sup>1</sup> Oskari Tammelin<sup>2</sup>

Poker is a family of games that exhibit imperfect information, where players do not have full knowledge of past events. Whereas many perfect-information games have been solved (e.g., Connect Four and checkers), no nontrivial imperfect-information game played competitively by humans has previously been solved. Here, we announce that heads-up limit Texas hold'em is now essentially weakly solved. Furthermore, this computation formally proves the common wisdom that the dealer in the game holds a substantial advantage. This result was enabled by a new algorithm, CFR<sup>+</sup>, which is capable of solving extensive-form games orders of magnitude larger than previously possible.

Games have been intertwined with the earliest developments in computation, game theory, and artificial intelligence (AI). At the very conception of computing, Babbage had detailed plans for an "automaton" capable of playing tic-tac-toe and dreamed of his Analytical Engine playing chess (1). Both Turing (2) and Shannon (3)—on paper and in hardware, respectively—developed programs to play chess as a means of validating early ideas in computation and AI. For more than a half century, games have continued to act as testbeds for new ideas, and the resulting successes have marked important milestones in the progress of AI. Examples include the checkers-playing computer program Chinook becoming the first to win a world championship title against humans (4), Deep Blue defeating Kasparov in chess (5), and Watson defeating Jennings and Rutter on *Jeopardy!* (6). However, defeating top human players is not the same as "solving" a game—that is, computing a game-theoretically optimal solution that is incapable of losing against any opponent in a fair game. Notable milestones in the advancement of AI have also involved solving games, for example, Connect Four (7) and checkers (8).

Every nontrivial game (9) played competitively by humans that has been solved to date is a perfect-information game. In perfect-information games, all players are informed of everything that has occurred in the game before making a decision. Chess, checkers, and backgammon are examples of perfect-information games. In imperfect-information games, players do not always have full knowledge of past events (e.g., cards dealt to other players in bridge and poker, or a seller's knowledge of the value of an item in an auction). These games are more challenging, with theory, computational algorithms, and instances of solved games lagging behind results in the perfect-information setting (10). And although

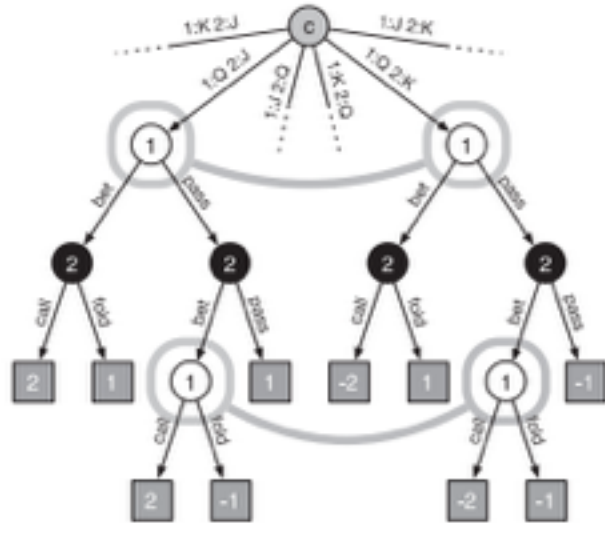
perfect information may be a common property of parlor games, it is far less common in real-world decision-making settings. In a conversation recounted by Bronowski, von Neumann, the founder of modern game theory, made the same observation: "Real life is not like that. Real life consists of bluffing, of little tactics of deception, of asking yourself what is the other man going to think I mean to do. And that is what games are about in my theory" (11).

Von Neumann's statement hints at the quintessential game of imperfect information: the game of poker. Poker involves each player being dealt private cards, with players taking structured turns making bets on having the strongest hand (possibly bluffing), calling opponents' bets, or folding to give up the hand. Poker played an important role in early developments in the field of game theory. Borel's (12) and von Neumann's

(13, 14) foundational works were motivated by developing a mathematical rationale for bluffing in poker, and small synthetic poker games (15) were commonplace in many early papers (12, 14, 16, 17). Poker is also arguably the most popular card game in the world, with more than 150 million players worldwide (18).

The most popular variant of poker today is Texas hold'em. When it is played with just two players (heads-up) and with fixed bet sizes and a fixed number of raises (limit), it is called heads-up limit hold'em or HULHE (19). HULHE was popularized by a series of high-stakes games chronicled in the book *The Professor, the Banker, and the Suicide King* (20). It is also the smallest variant of poker played competitively by humans. HULHE has  $3.16 \times 10^{17}$  possible states the game can reach, making it larger than Connect Four and smaller than checkers. However, because HULHE is an imperfect-information game, many of these states cannot be distinguished by the acting player, as they involve information about unseen past events (i.e., private cards dealt to the opponent). As a result, the game has  $3.19 \times 10^{14}$  decision points where a player is required to make a decision.

Although smaller than checkers, the imperfect-information nature of HULHE makes it a far more challenging game for computers to play or solve. It was 17 years after Chinook won its first game against world champion Tinsley in checkers that the computer program Polaris won the first meaningful match against professional poker players (21). Whereas Schaeffer et al. solved checkers in 2007 (8), heads-up limit Texas hold'em poker had remained unsolved. This slow progress is not for lack of effort. Poker has been a challenge problem for artificial intelligence, operations research, and psychology, with work going back more than 40 years (22); 17 years ago,



**Fig. 1. Portion of the extensive-form game representation of three-card Kuhn poker (16).** Player 1 is dealt a queen (Q), and the opponent is given either the jack (J) or king (K). Game states are circles labeled by the player acting at each state ("c" refers to chance, which randomly chooses the initial deal). The arrows show the events the acting player can choose from, labeled with their in-game meaning. The leaves are square vertices labeled with the associated utility for player 1 (player 2's utility is the negation of player 1's). The states connected by thick gray lines are part of the same information set; that is, player 1 cannot distinguish between the states in each pair because they each represent a different unobserved card being dealt to the opponent. Player 2's states are also in information sets, containing other states not pictured in this diagram.



Motivation

Engagement

Feedback

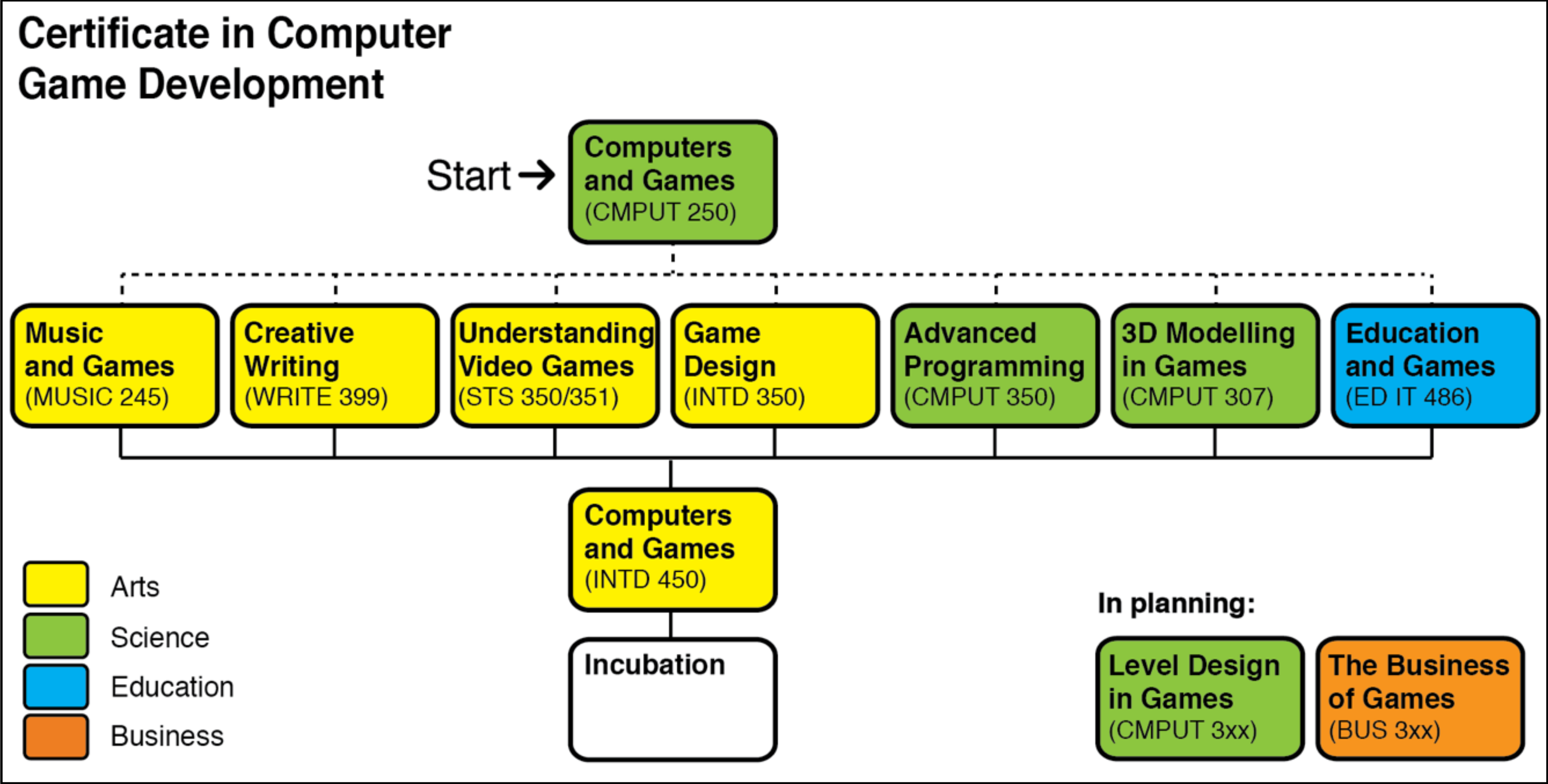
Results

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# Student Demand



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# Multiple Goals

Meet demand of  
UofA students for  
the course

Promote UofA and  
its programs to  
broader audiences

Promote research  
and new teaching  
technologies

**Motivation**

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# Multiple Audiences

In-class version of  
the course  
(STS 350)

Online version of  
the course  
(STS 351)

MOOC version of  
course  
(UVG)

**Motivation**

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# Multiple Audiences



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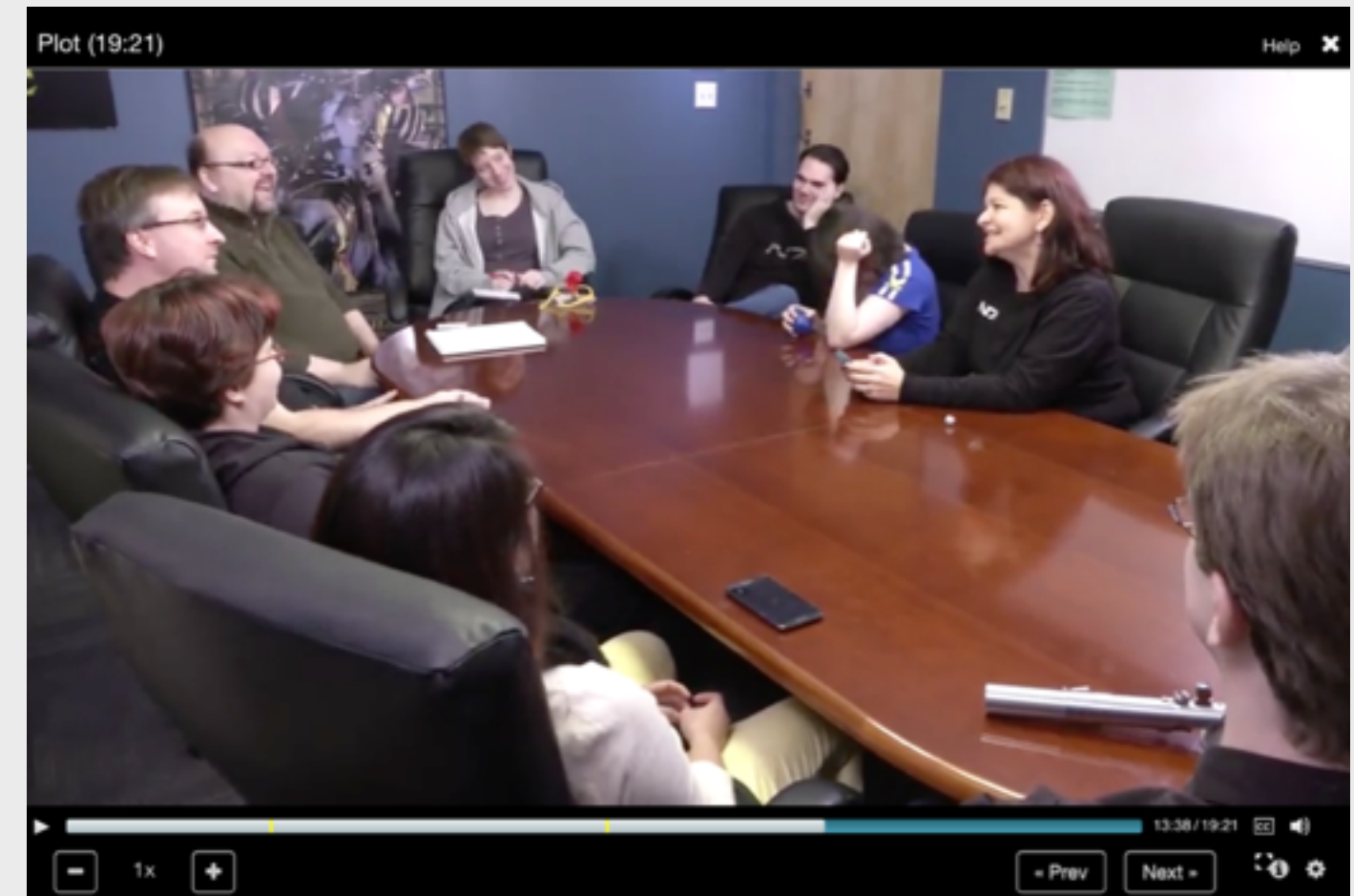
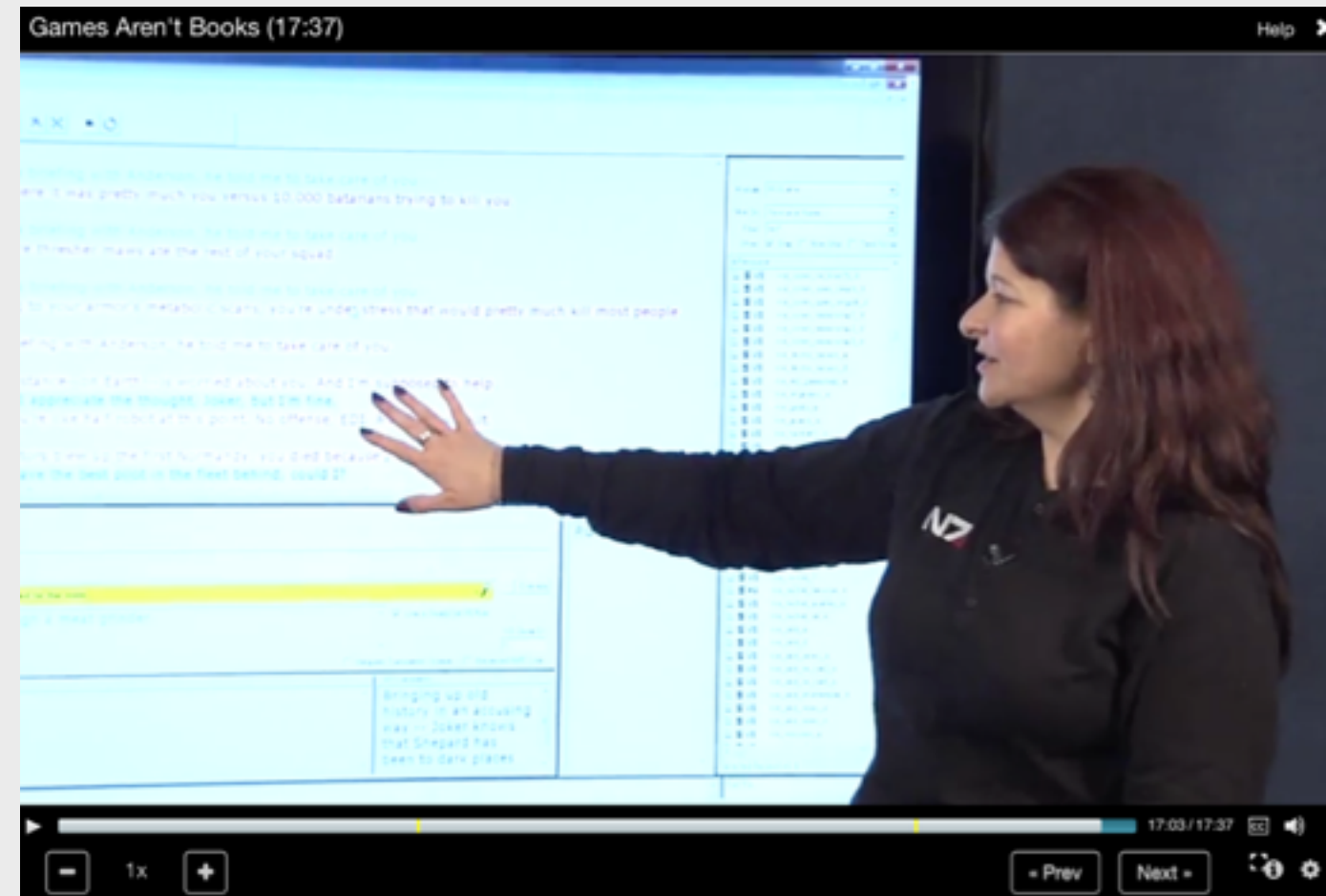
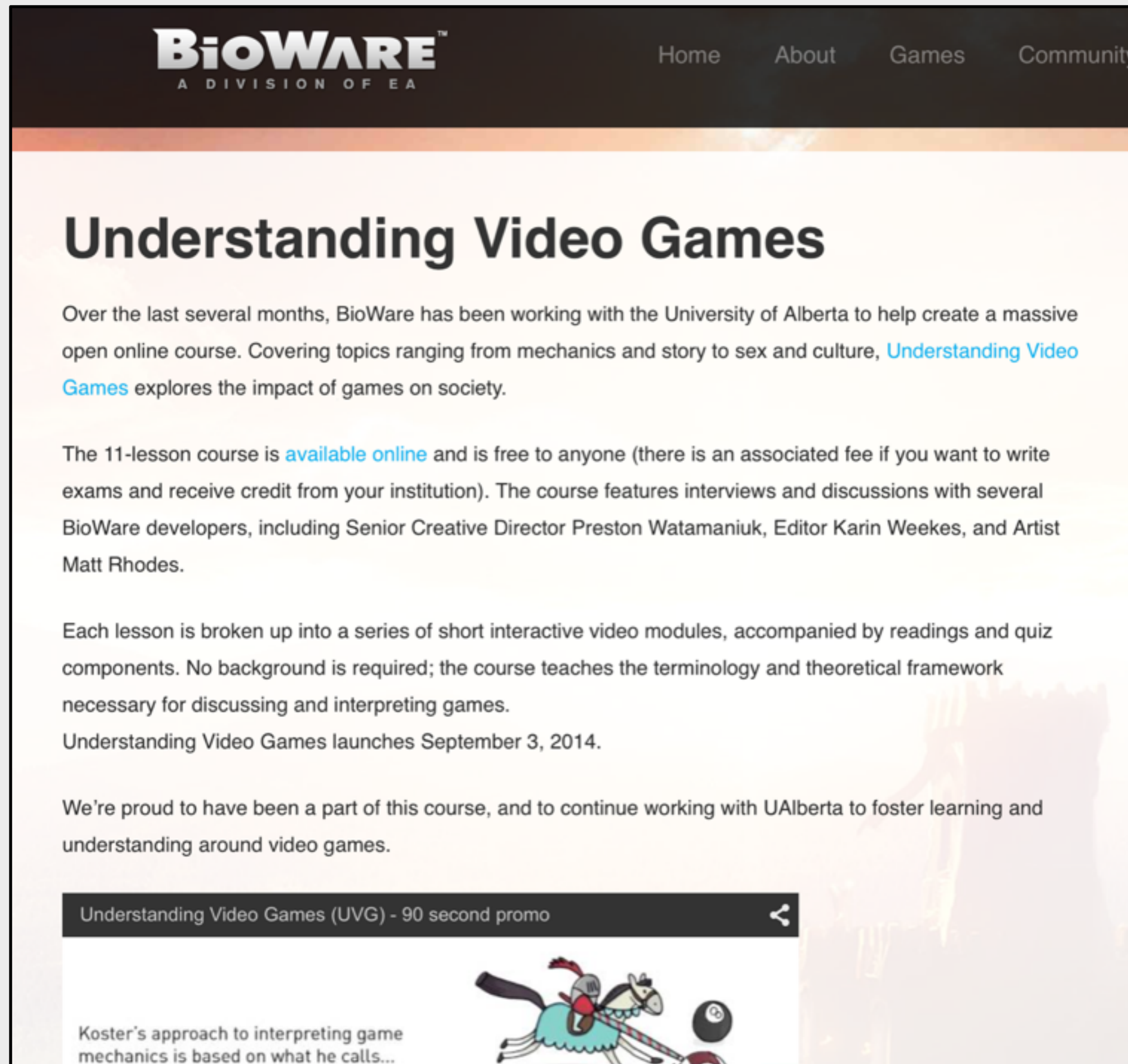
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# Industry Participation



# Motivation

## Engagement

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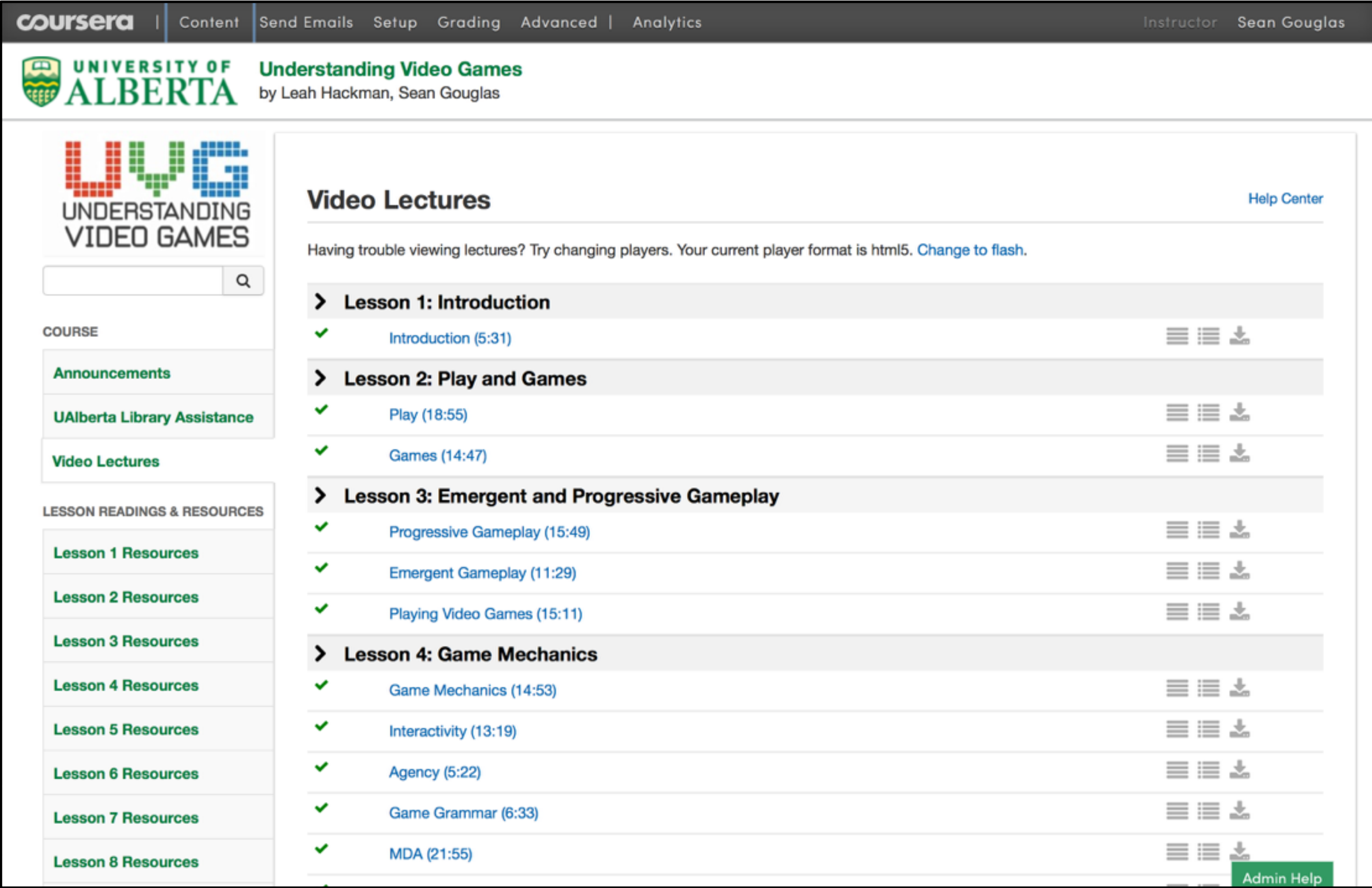
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# Game-like Aesthetic



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# Game-like Aesthetic

Coursera | Content | Send Emails | Setup | Grading | Advanced | Analytics

Instructor Sean Goulas

UNIVERSITY OF Understanding Video Games

Games (14:47) Help Center




A video player interface showing a woman with glasses and a patterned top speaking. The background is a futuristic, dark environment with glowing lights and structures. The video progress bar shows 05:07 / 14:47.

Lesson 7 Resources  
Lesson 8 Resources

MDA (21:55)

MDA (21:55) Help Center



A video player interface showing a man with glasses and a blue shirt speaking. The background is a rocky, desert-like landscape under a bright sky. The video progress bar shows 05:14 / 22:26.

Admin Help

# Motivation

## Engagement

## Feedback

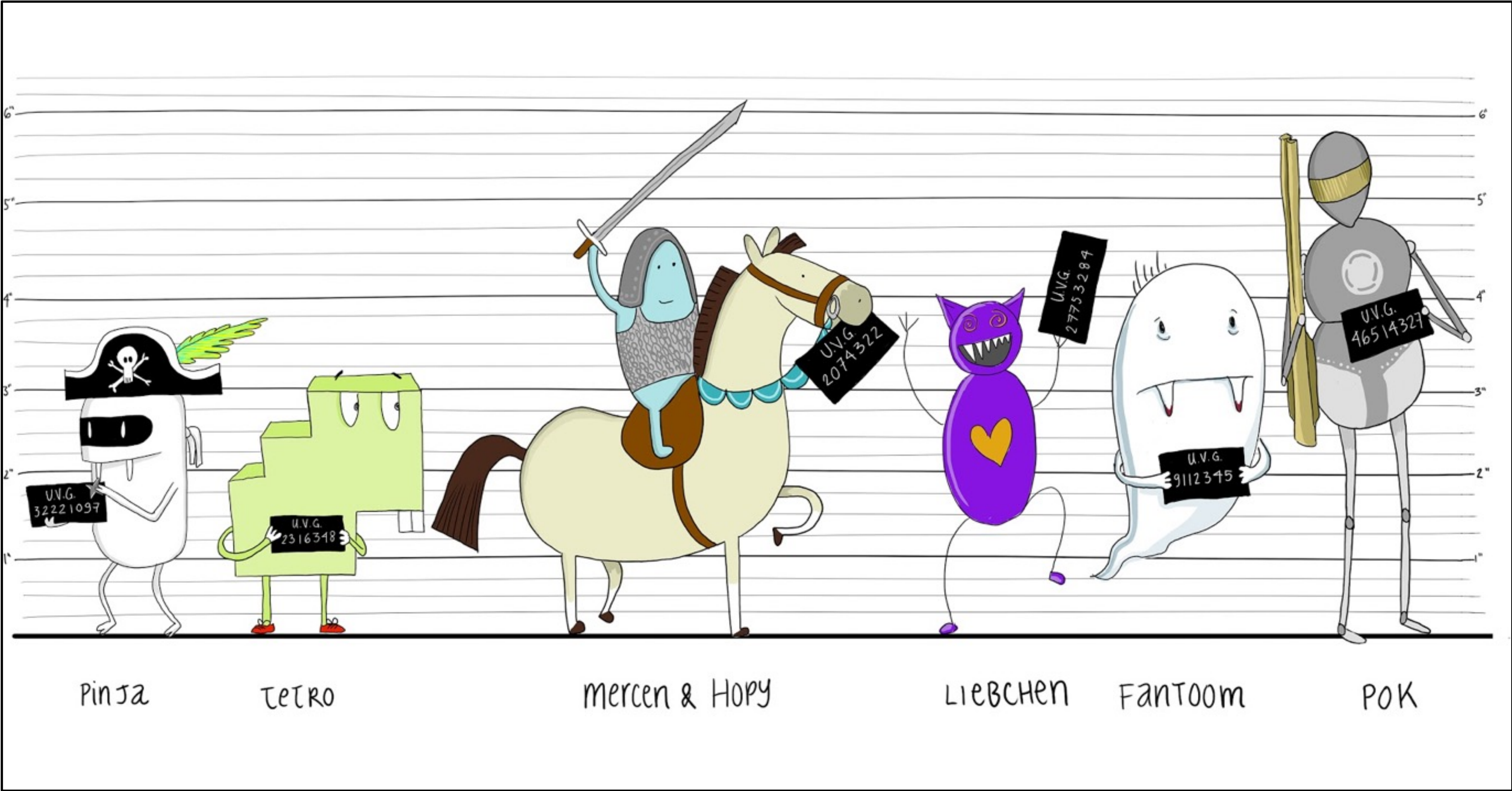
## Results

## Takeaways





# Game-like Aesthetic



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# Game-like Aesthetic



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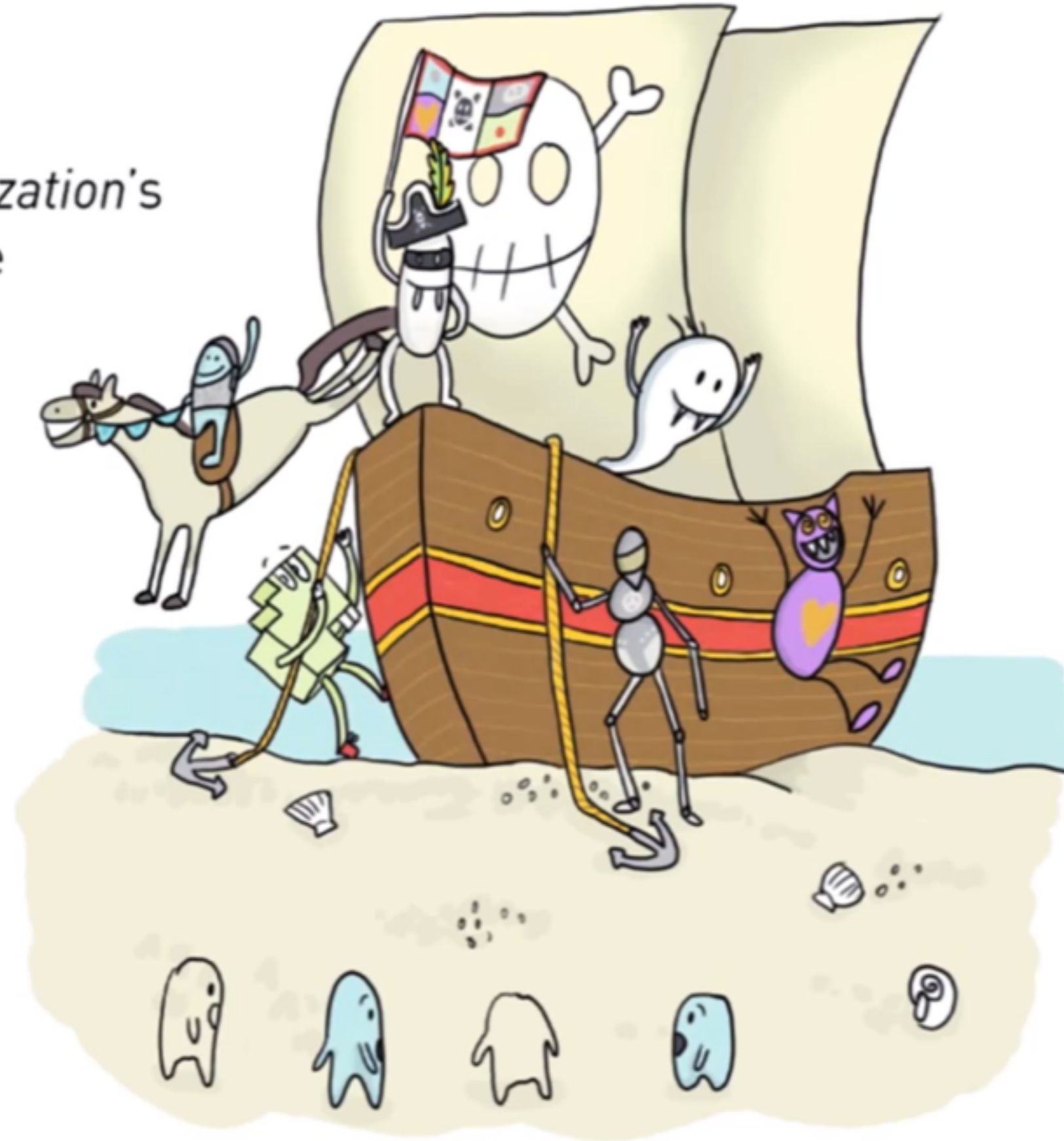




# Game-like Aesthetic

We've just described some of *Colonization's* race-based game mechanics. These mechanics are used to...

- A) Give the player a better sense of immersion
- B) Give the player different play style opportunities
- C) Create moments for emergent gameplay
- D) Influence the game's narrative setting
- E) All of the above



▶ 🔊 0:30 / 1:09

# Motivation

## Engagement

# Feedback

## Results

## Takeaways





# Feedback Design

Start a game-like activity not yet directly tied to course content



You're a  
Game  
Mechanic!

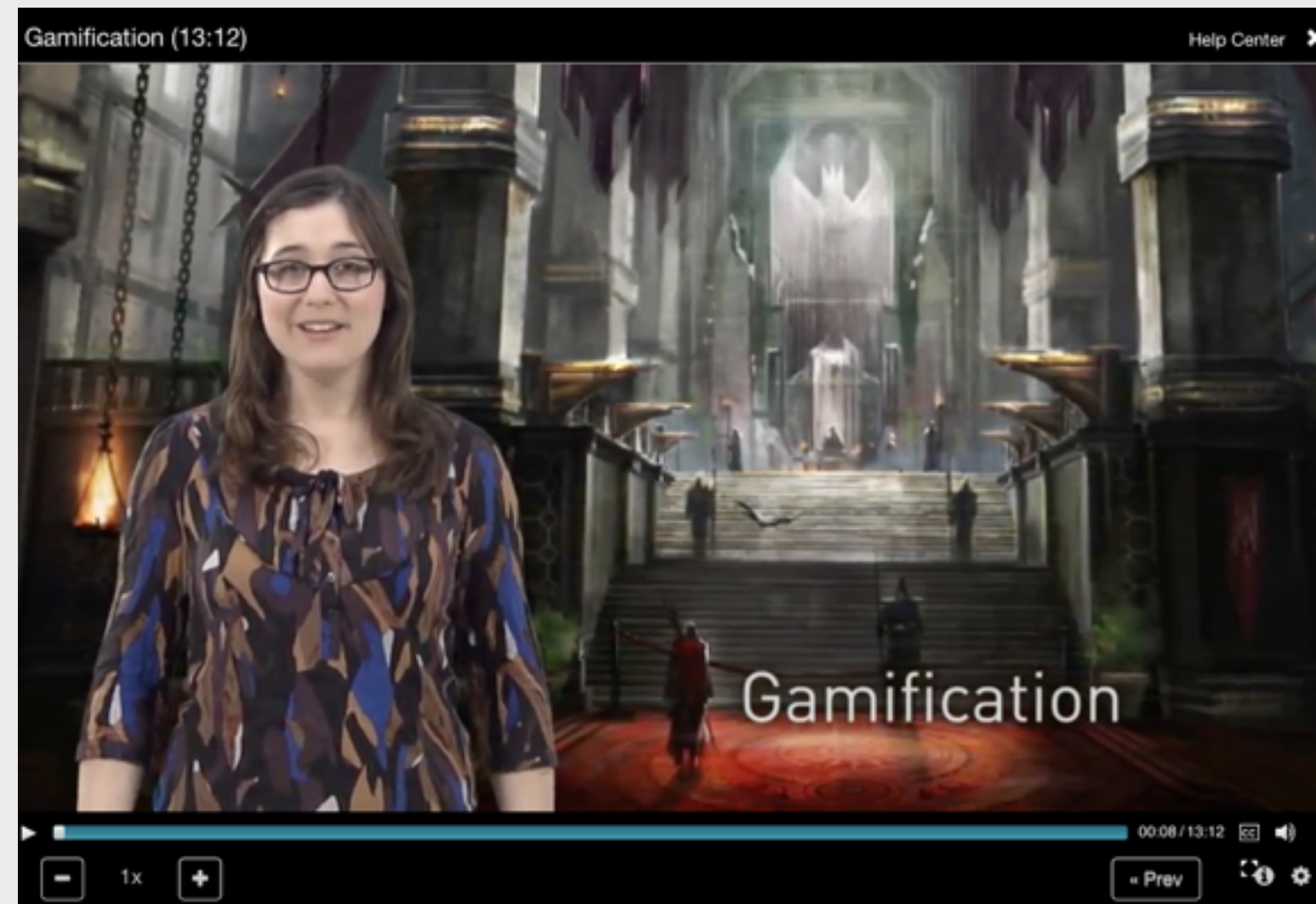


You've  
Inverted  
Hierarchies!

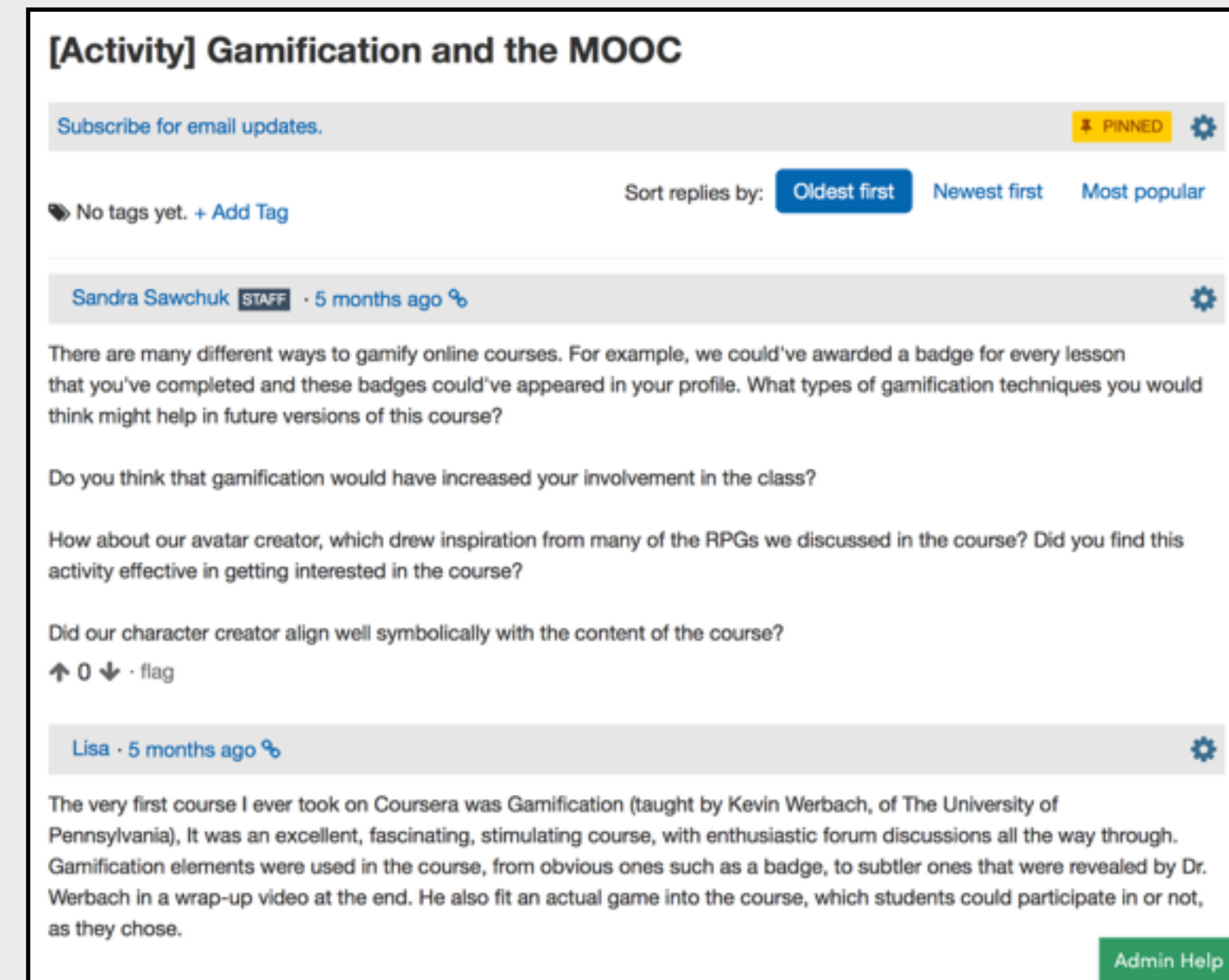


You've  
Eschewed  
Essentialism!

Use that activity as object of study when lesson arises later



Present amalgamated results of activity in forum discussion



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Game Studies

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computer game research

volume 11 issue 2  
May 2011  
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**Geoffrey M. Rockwell**

Dr. Geoffrey Martin Rockwell is a Professor of Philosophy and Humanities Computing at the University of Alberta, Canada. He received a Ph.D. in Philosophy from the University of Toronto and worked at the University of Toronto as a Senior Instructional Technology Specialist. From 1994 to 2008 he was at McMaster University where he was the Director of the Humanities Media and Computing Centre (1994 - 2004) and he led the development of an undergraduate Multimedia program. He has published and presented papers in the area of philosophical dialogue, textual visualization and analysis, humanities computing, instructional technology, computer games and multimedia including a book, *Defining Dialogue: From Socrates to the Internet* with Humanity Books. He is the Director of the Canadian Institute for Research in Computing and the Arts at the University of Alberta.

**The Leisure of Serious Games: A Dialogue**

by Geoffrey M. Rockwell, Kevin Kee

**Abstract**

This dialogue was performed by Dr. Geoffrey Rockwell and Dr. Kevin Kee<sup>1</sup> as a plenary presentation to the 2009 Interacting with Immersive Worlds Conference at Brock University in St. Catharines, Canada. Kevin introduced Geoffrey as a keynote speaker prepared to present on serious games. Instead of following convention, Geoffrey invited Kevin to engage in a dialogue testing the claim that "games can be educational". Animated by a spirit of Socratic play, they examined serious gaming in the light of the insights of ancient philosophers including Socrates, Plato and Aesop, twentieth-century theorists such as Ludwig Wittgenstein, Bernard Suits, Johan Huizinga, and Roger Callois, and contemporaries such as Espen Aarseth, Bernard Suits and Mihaly Csikszentmihalyi. Their dialogue touched on topics ranging from definitions of play and games, to existing examples of "serious games", to divisions between games and simulations, and the historical trajectories of comparable media. Their goal was to provide an introduction to these topics, and provoke discussion among their listeners during the conference that followed. In the end, they agreed that the lines of separation between "games" and "learning" may not be as clear as sometimes assumed, and that in game design we may find the seeds of serious play.

**Keywords:** serious games, play, education, Socratic dialogues, theory.

"Anyone who tries to make a distinction between education and entertainment doesn't know the first thing about either."  
- Marshal McLuhan

**GEOFFREY ROCKWELL:** Dear Kevin, I'm sorry to have to disappoint you. You invited me here today to talk to you about serious games, but I don't really know the first thing about them, because I don't believe that games can be serious.

Present amalgamated results of activity in forum discussion

Education and the MOOC

PINNED

Sort replies by: Oldest first Newest first Most popular

months ago

to gamify online courses. For example, we could've awarded a badge for every lesson these badges could've appeared in your profile. What types of gamification techniques you would use in this course?

would have increased your involvement in the class?

which drew inspiration from many of the RPGs we discussed in the course? Did you find this interesting in the course?

well symbolically with the content of the course?

Admin Help



You're a Game Mechanic!



You've Inverted Hierarchies!



You've Eschewed Essentials

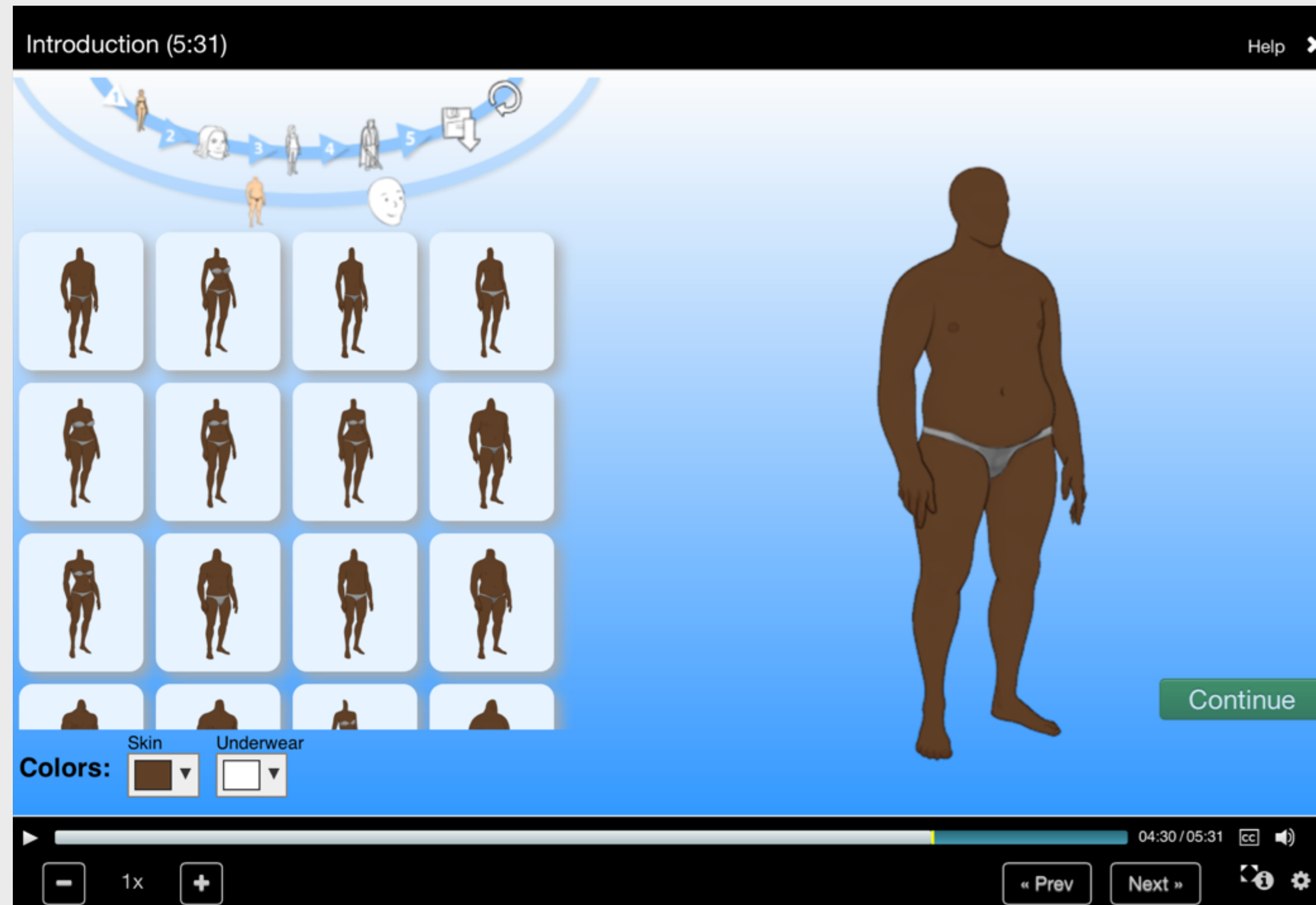
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# Avatar Creator



Motivation

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# Avatar Creator



Motivation

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# Avatar Creator



Motivation

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# Avatar Creator



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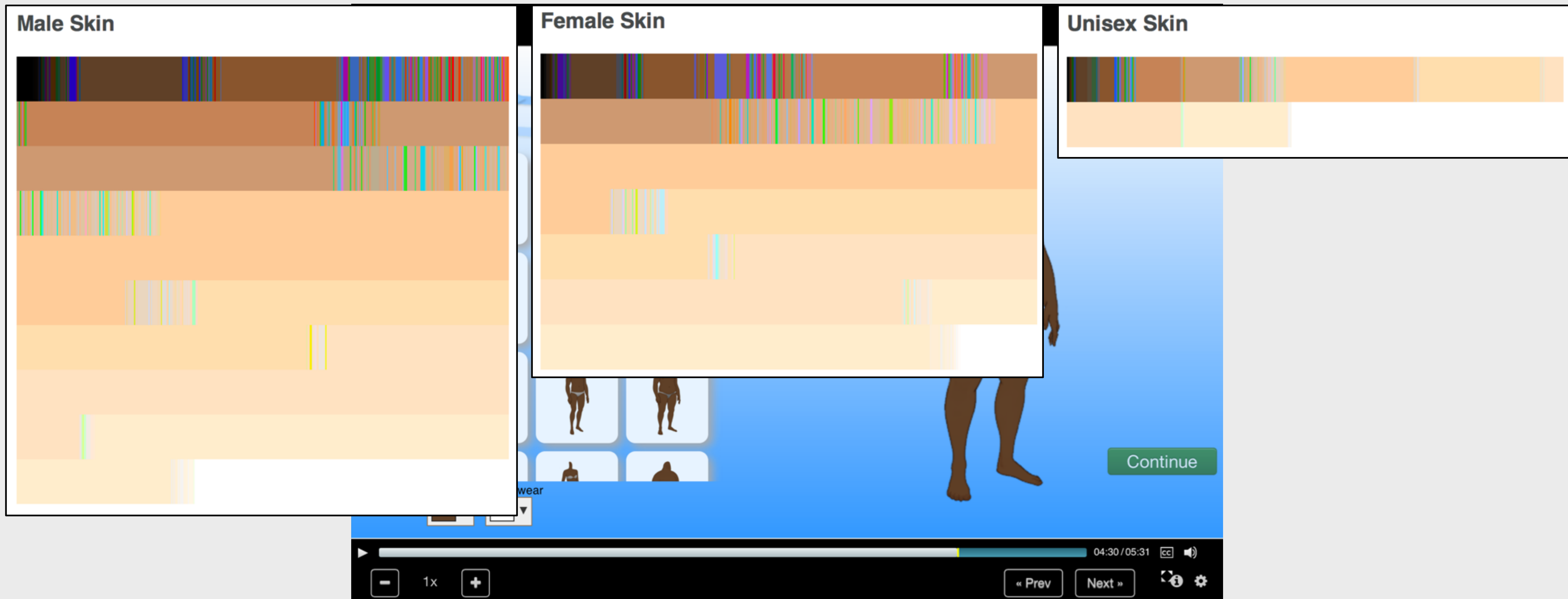
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# Avatar Creator



Motivation

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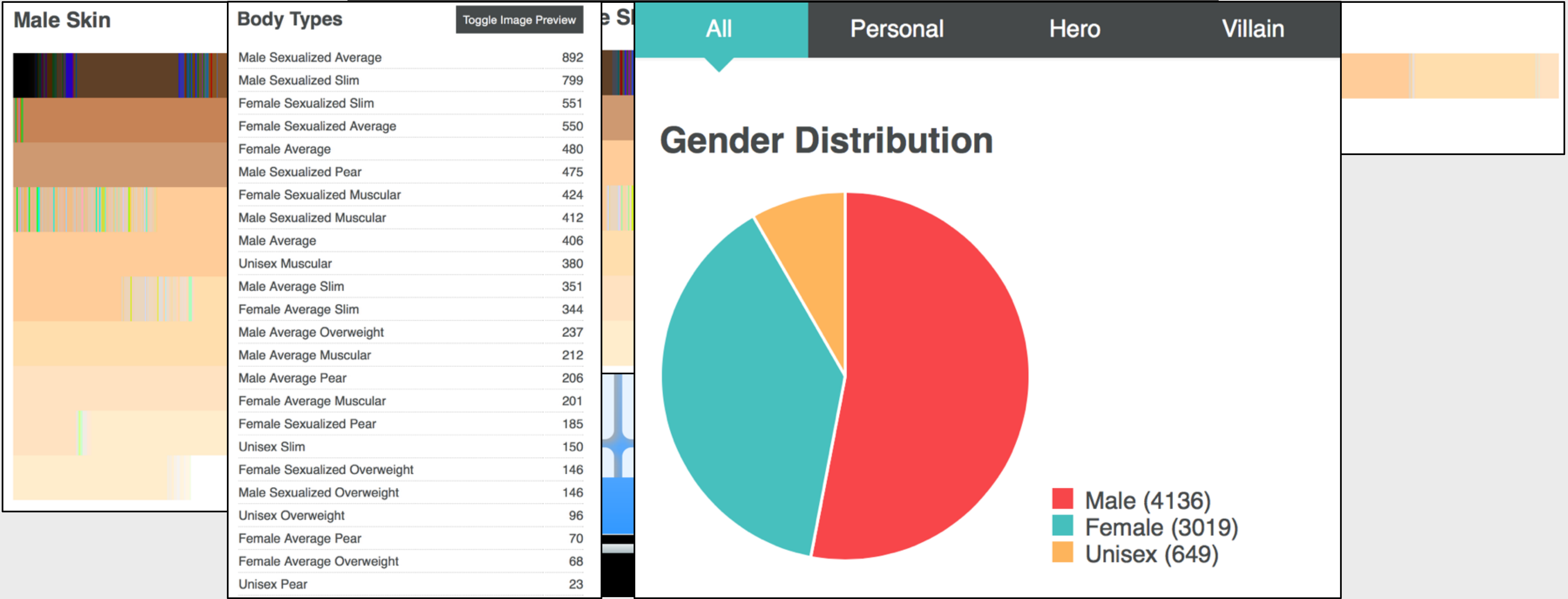
Results

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# Avatar Creator



Motivation

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# Avatar Creator

Male Skin



Body Types

- Male Sexualized Average
- Male Sexualized Slim
- Female Sexualized Slim
- Female Sexualized Average
- Female Average
- Male Sexualized Pear
- Female Sexualized Muscular
- Male Sexualized Muscular
- Male Average
- Unisex Muscular
- Male Average Slim
- Female Average Slim
- Male Average Overweight
- Male Average Muscular
- Male Average Pear
- Female Average Muscular
- Female Sexualized Pear
- Unisex Slim
- Female Sexualized Overweight
- Male Sexualized Overweight
- Unisex Overweight
- Female Average Pear
- Female Average Overweight
- Unisex Pear

Feedback: Wish List for the Avatar Creator

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Sort replies by: Oldest first Newest first Most popular

Lisa · 6 months ago

am having far too much fun creating avatars! So first, thank you for providing it for us. It made for a great way to start the course and is a great icebreaker in the forums.

Many people wanted to create gameplay avatars, but in trying to do that, I'm finding the options, at least for female avatars, to be somewhat limited. (See my attempts below. They are supposed to be elves, a witch, fighters and a princess, but I couldn't make some of them recognizable as those things.)



Besides game avatar features, there are other things I'd like to see, so I'm sharing my wish list here, in case you decide to expand or upgrade the avatar creator. (These are for the female avatar.)

The choices for any given item appear in a random order. If you leave that item and return, they're in a completely different order. This is like Coursera quiz questions, where the multiple choice answers appear randomly by default – but they can be set to always appear in the same order. Please do this. It would be easier if we could remember, for example, that we

Admin Help

Villain



e (4136)  
ale (3019)  
ex (649)

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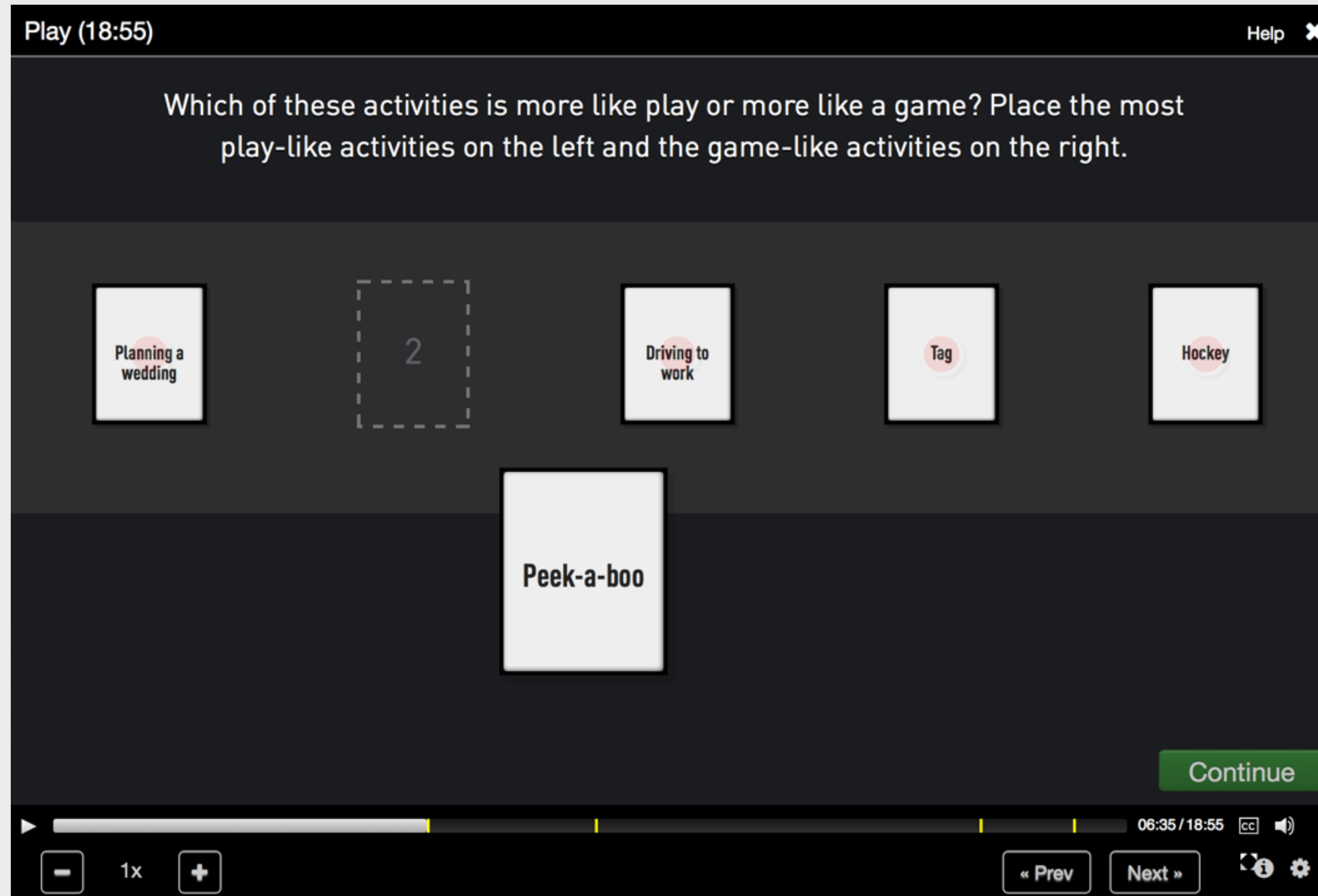
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# Sorters



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# Sorters

Play (18:55) Help ✕

Which of these activities is more like play or more like a game? Place the most play-like activities on the left and the game-like activities on the right.

**Your Answer**

Planning a wedding 1	Peek-a-boo 2	Driving to work 3	Tag 4	Hockey 5
-------------------------	-----------------	----------------------	----------	-------------

**Class Average (3219 Answers)**

Peek-a-boo 2.3	Driving to work 2.56	Planning a wedding 2.84	Tag 2.9	Hockey 4.4
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Continue

06:35 / 18:55 CC 🔊

⏮ 1x ⏭ « Prev Next » ⓘ ⚙

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# Sorters

Play ([exercise])

[exercise] Play/Game spectrum

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VideoLectures x exercise x + Add Tag

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Gabriel [redacted] · 6 months ago

My answer was equal as the average:  
peek-a-boo / driving home / planing a mariage / tag / hockey

But I would like to hear about why you guys think is this correct or even if you disagree with the average.

1 up · flag

Alastair [redacted] · 6 months ago

I disagreed with "Driving to Work" being play-like, which I mentioned at [https://class.coursera.org/uvg-001/forum/thread?thread\\_id=38](https://class.coursera.org/uvg-001/forum/thread?thread_id=38) , but otherwise agreed with the ordering.

0 up · flag

+ Comment

Suzanne [redacted] · 6 months ago

My answer was planning a wedding / peek-a-boo / tag / driving to work / hockey.  
Looking at this now I would actually place peek-a-boo before planning a wedding.  
I placed planning a wedding closer to the play side because I feel that games often have defined rules and a defin

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# Game Design Challenge



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## *Children's Games,* Bruegel (1560)



ts

Takeaways





*Landscape with  
Morra Players,  
van Laer (1640s)*



ts

Takeaways





*A Game of Morra,  
Sorbi (1920s)*



ults

Takeaways





# Game Design Challenge

## [Activity] New Morra Rules

You are subscribed. [Unsubscribe](#)

[morra](#) × [Lesson3](#) × [rules](#) × + Add Tag

Sort replies by: Oldest first

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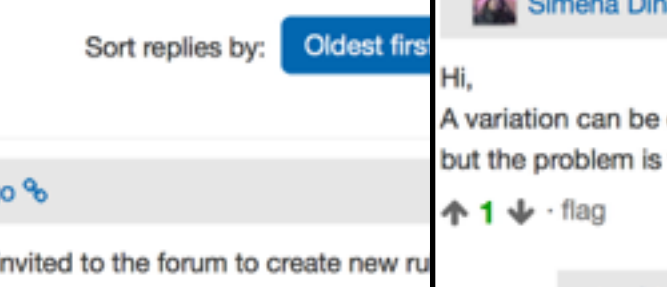
José [Signature Track] · 5 months ago 🔄

Hi all, according to the video lecture of week 3, we are invited to the forum to create new rules for Morra game. The idea is to make it more difficult than the original one, but the problem is that it is very difficult to be right, then it cannot be more difficult than the original one.

**Blind Morra**

*the idea with this rule is to use the sense of touch*

- Players put one hand horizontally in front of the eyes of his opponent to block his view, the other hand must be located on the shoulder of his opponent (**fig. 1**).



**fig. 1 side and top view of the position of the players**

- Each player say to the same time one number of 1 to 10 (**fig 2**).
- both players extends and touch with fingers of the Hand that located on the shoulder of the opponent. Each one will know that the quantity of finger are extended. When the zero is Assigned punishment is assigned.

A variation can be done by changing the sum operation, it can be a rest or a multiplication. I believe that we can change the game.

↑ 1 ↓ · flag

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José [Signature Track] · 5 months ago 🔄

Hi, I thought that type of rule too, another easy rule is only guess the amount fingers need to add or make another mathematical operation.

↑ 0 ↓ · flag

---

David Lawrence · 5 months ago 🔄

Hi Simena, that would work for multiplication if you limit the number of fingers the player can show. Some numbers would be left out.

0, 1, 2, 3, 4, 6, 8, 9, 12, 16 would be possible if you the number of fingers was zero to ten. If a player calls out a number that is "impossible" they could lose a point.

Good idea!

↑ 0 ↓ · flag

---

Mei [Signature Track] · 5 months ago 🔄

Another way to play the game is instead of adding the numbers, you can do subtraction. The player whose answer gets a point. You can even use this math game to teach addition, subtraction, multiplication, and division to students.

↑ 0 ↓ · flag

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Sean Gouglas INSTRUCTOR · 5 months ago 🔄

These are interesting ideas. Thanks. It is always fun to add rules to a simply (and beautiful) game. I hope to break it :-)

---

Daniel [Signature Track] · 5 months ago 🔄

I thought about using a paper to play, with that we can make more changes and avoid cheating.

- First the players write a number in the paper, then they throw out a single hand, showing zero to five fingers.
- Now they show the paper. If the number guessed is the same as the sum this player wins.

Nest step:

- Every player can write a new number, but it can't be one that was wrote before by any one.
- They throw the hand again. Then they show the paper. If the sum is the same as any of the guesses (included the first one) the player that wrote that number wins. So they will compete with the new and the old numbers.

And the game goes on.  
The only other rule is going to be: "if the players wrote the same number then they have to erase that number and play again".

↑ 2 ↓ · flag

+ Comment

---

Barbara [Signature Track] · 5 months ago 🔄

Another variation could be to create a simple algebraic equation like  $x + y = z$ . One player is set up as x and the other as y. Each player writes down their guess at z then tries to put up a number of fingers to maximize the probability of getting their z to show up. The person with the most correct z answers wins. This could be a good way of teaching the concepts of variables and probability.

↑ 1 ↓ · flag

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José [Signature Track] · 5 months ago 🔄

but the game not change much with that rule, because you making sums too. the difference is you dont put restriction with the result, I think.

greetings

edit

ok i read a lot of times after I responce, for some reapon I avoid the details xD, but is a intersting how you use the game with a educational purpouse. I have a question, you handle the values of Z 0 to 10? or the numrs of results dont have limit?.

maybe a suggestion for put a indefinity numrs of results is each player can use two papers, in one paper put the value for z,

# Motivation

## Engagement

# Feedback

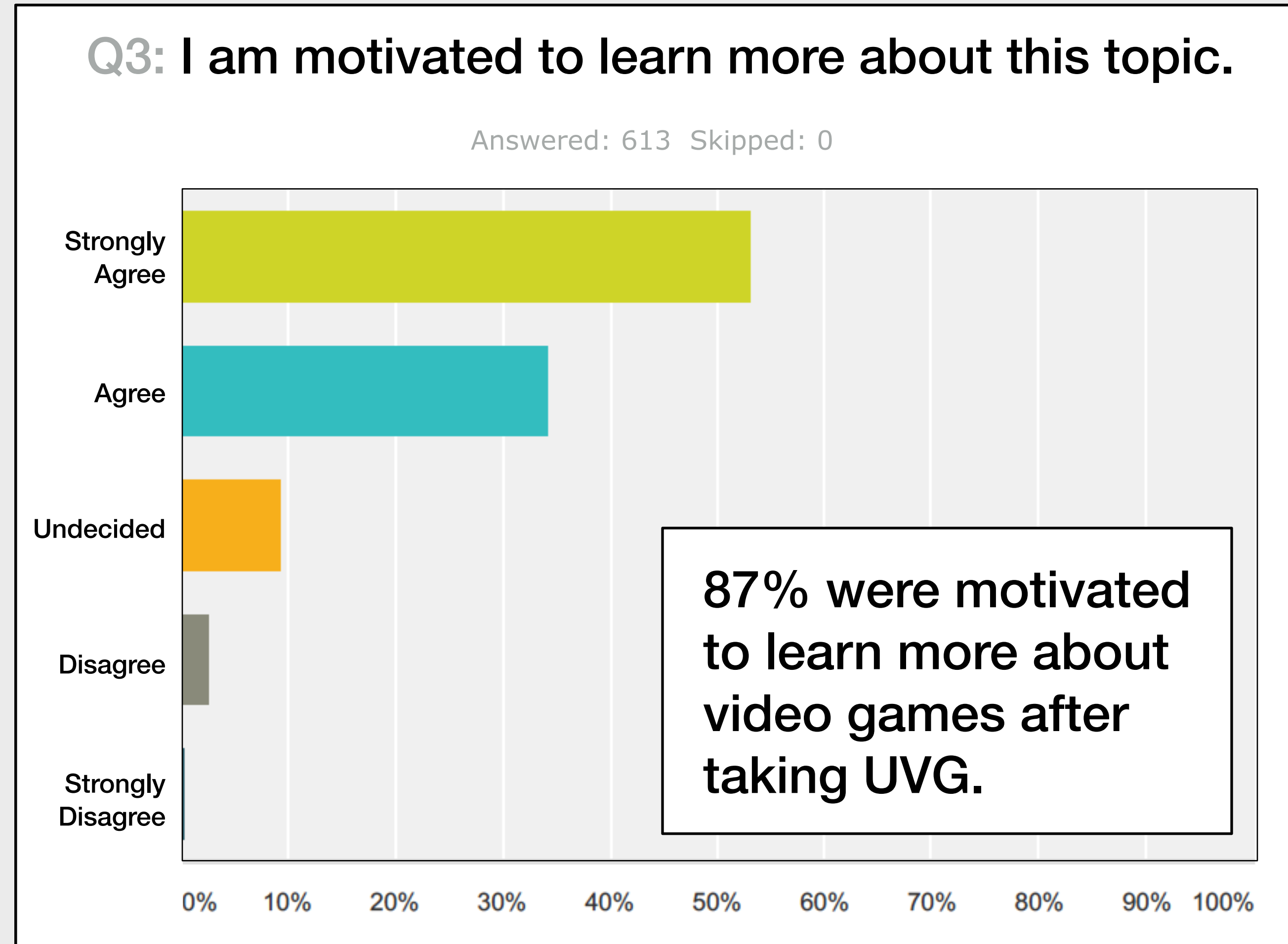
## Results

## Takeaways





# Student Surveys



Motivation

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Feedback

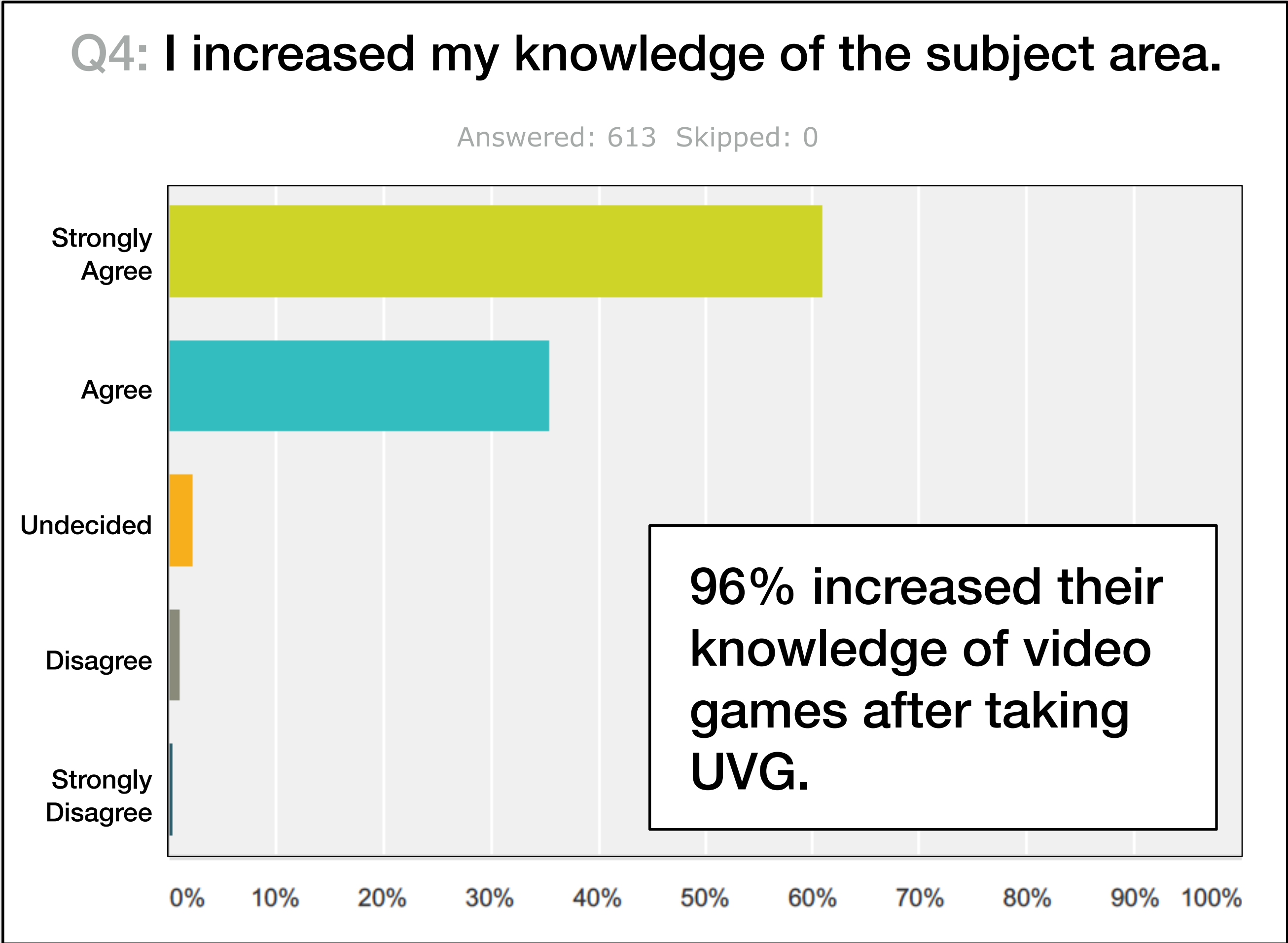
**Results**

Takeaways





# Student Surveys



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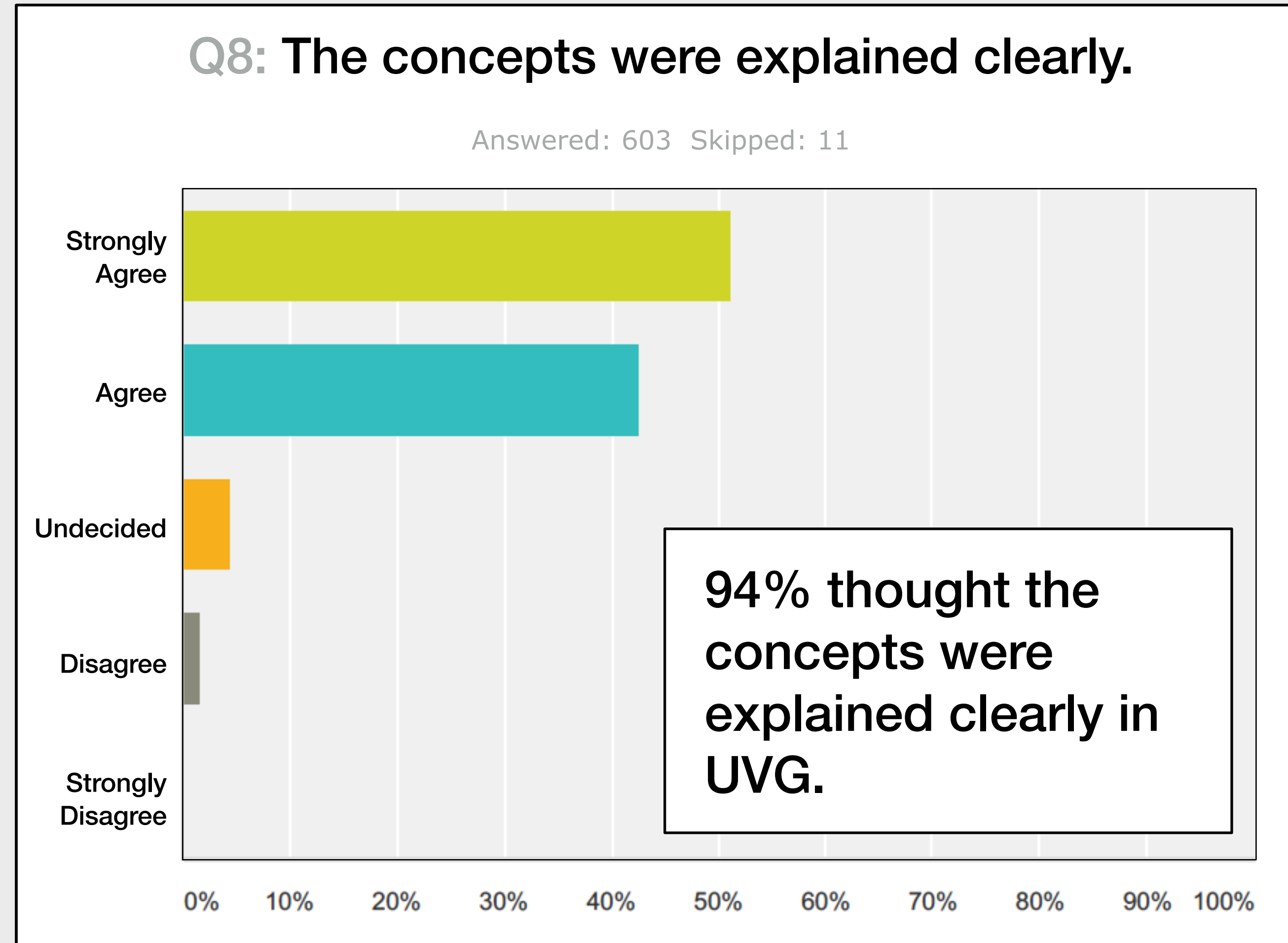
Results

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# Student Surveys



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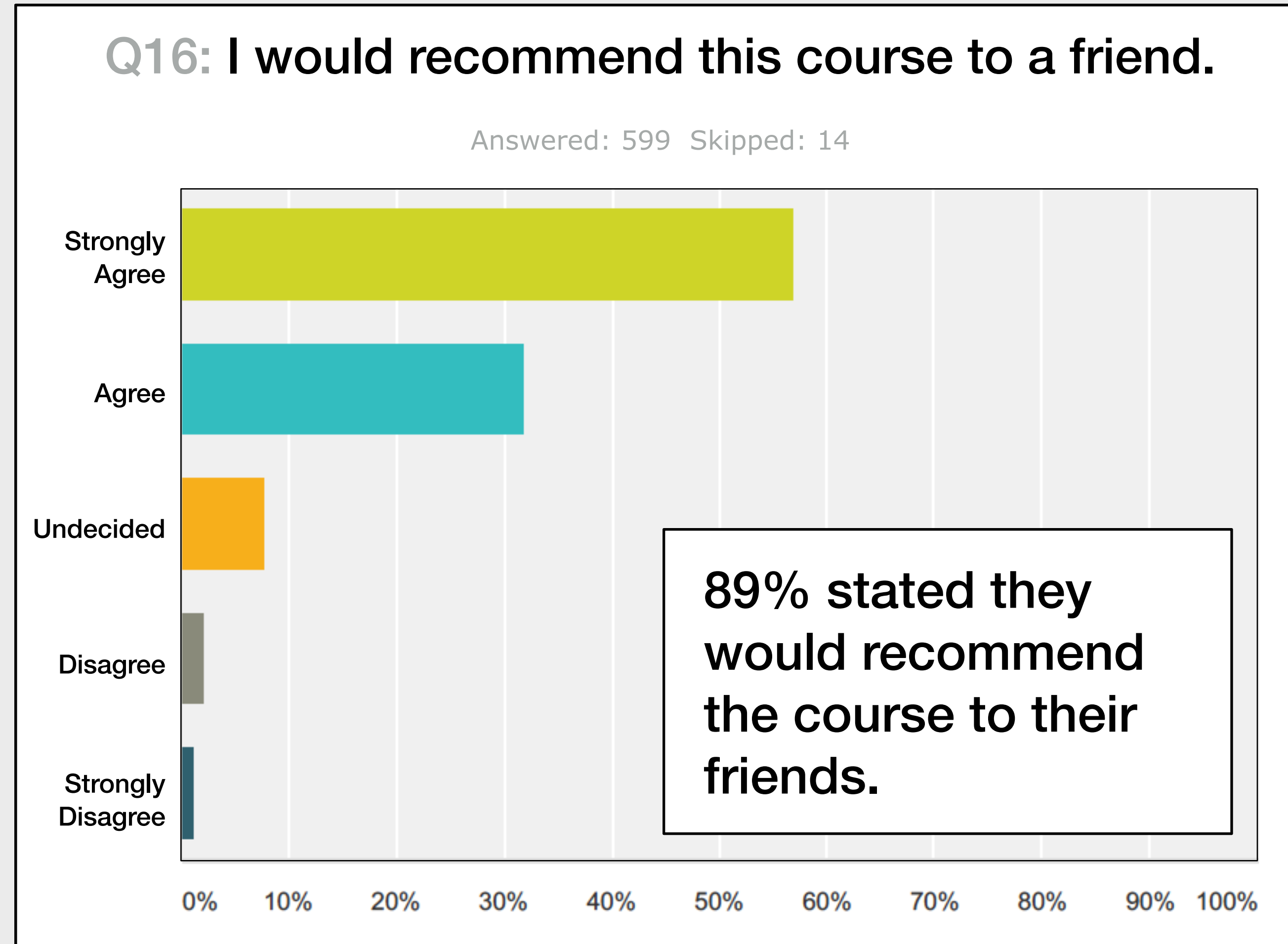
**Results**

Takeaways





# Student Surveys



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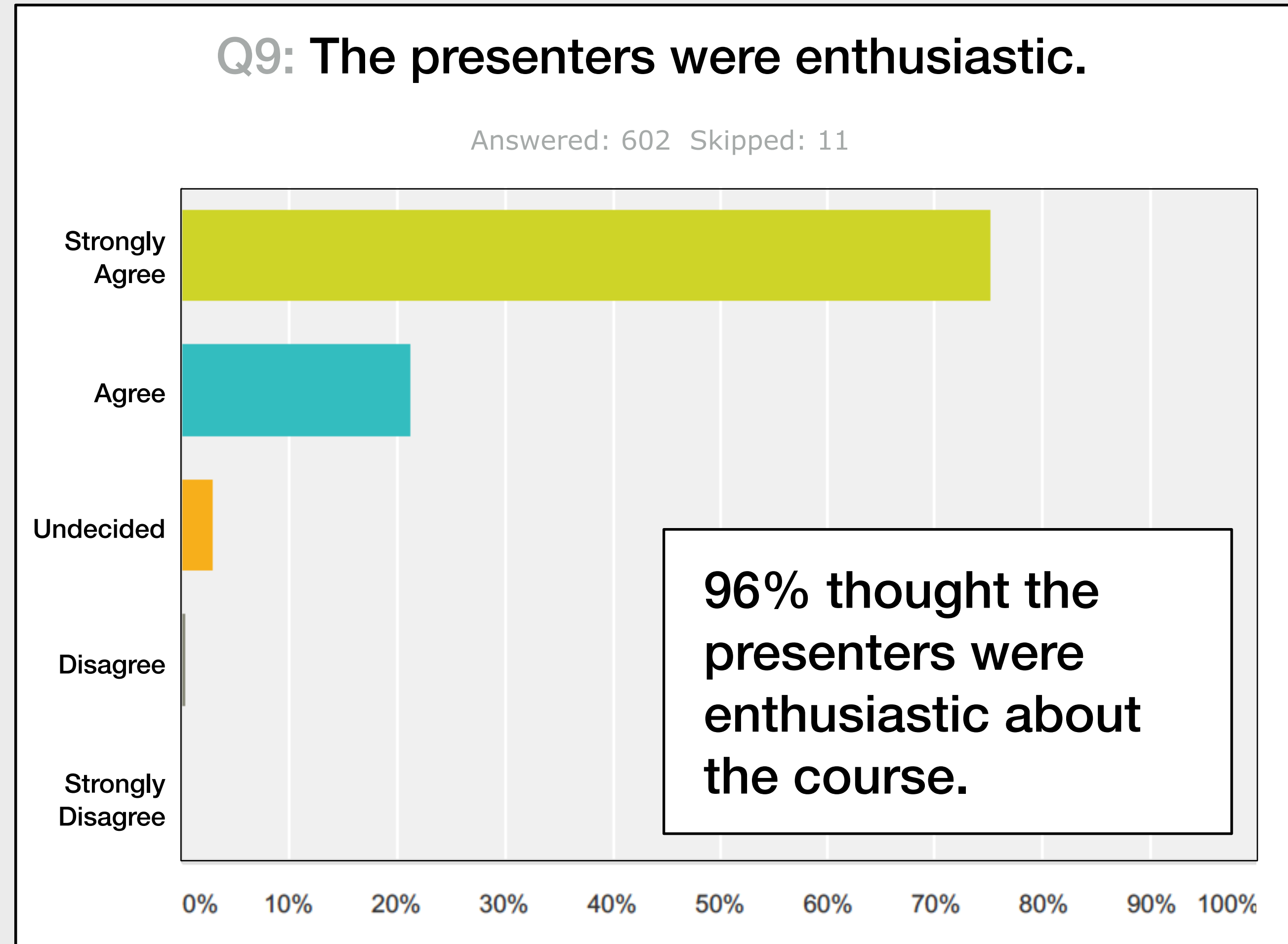
**Results**

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# Student Surveys



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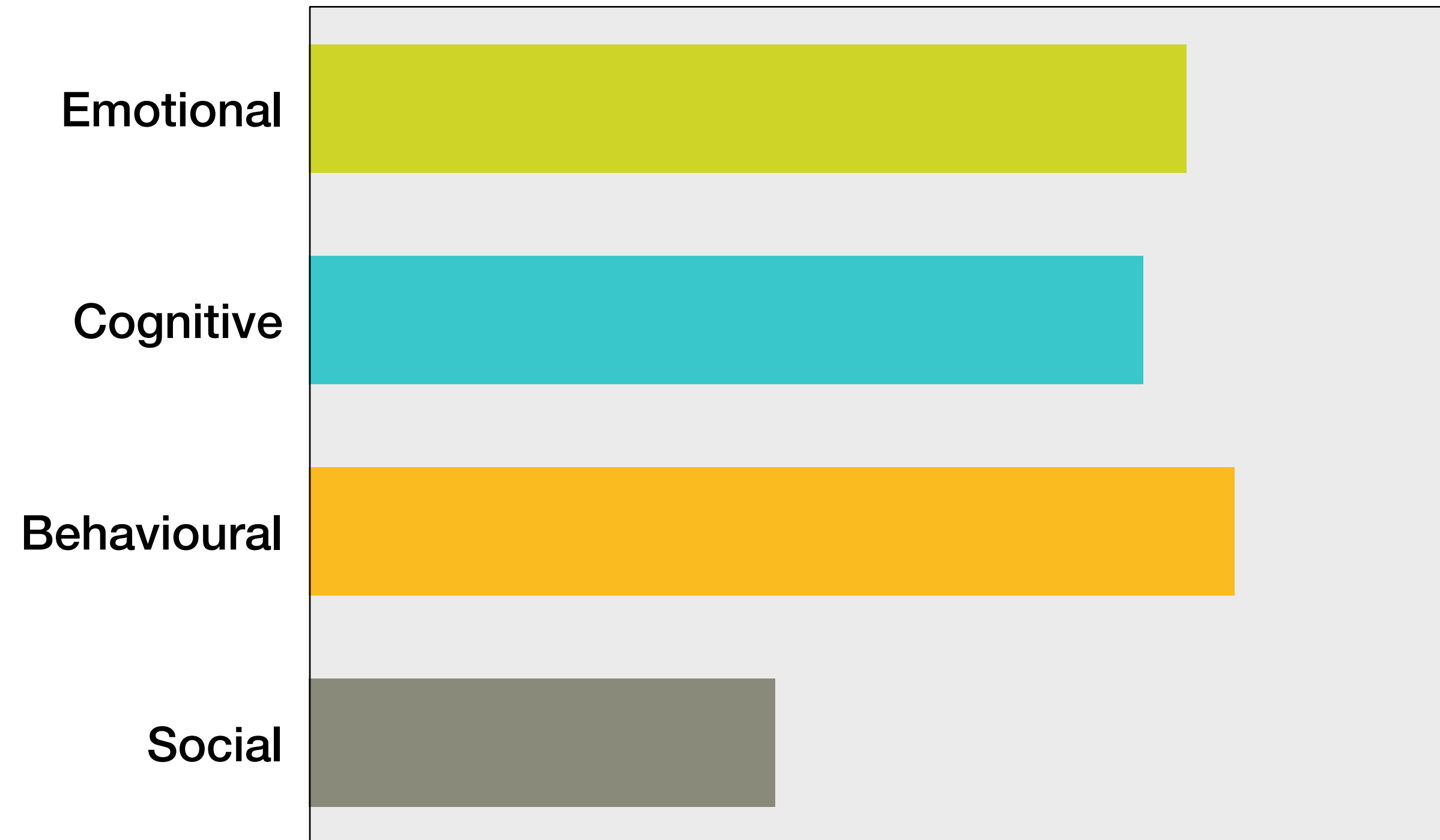
Takeaways





# Measuring Engagement (Avatar)

## Preliminary engagement results.



Working with the avatar ...

... was an exciting part of my learning.

... allowed me to learn more about the material.

... prompted me to check in regularly.

... helped me to connect with other students.

Motivation

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# Feedback Loop

**The feedback loops proved effective in promoting student engagement especially cognitive, emotional, and behavioural engagement.**

**Social engagement was not as strong. Feedback loops did not prompt students to create additional interactions, like study groups.**

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# Course Release Schedule

***A House of Cards* release model seem to improve completion rates for the MOOC version of the course, and likely improved cognitive engagement amongst students.**

**A weekly release (or cohort model) will likely improve social, emotional, and behavioural engagement amongst students.**

Motivation

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# Forum Decorum

**Have strategies and prepared text in place to address controversial topics and behaviours prior to the course starting.**

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