

The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. They are located in the top-left, bottom-left, and bottom-right areas of the slide.

Learning Game Design Characteristics through the Study of Flow and the Elemental Tetrad in the World of Warcraft & Minecraft

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Reflecting on the Problem

- Educational games offer compelling opportunities for education, yet curriculum designers are not good at game design.
- Educational games are often not fun, yet commercial games are designed to enhance engagement, to involve the senses and to capture the imagination of players.
- Certain models exist that may contribute to addressing the problem.
- Can we learn new information about learning game design from the study of successful commercial games?

Prior Research by Game Design Experts

- James Paul Gee – Games, Learning and Society; video games and learning
- Constance Steinkuehler – World of Warcraft research
- Marc Prensky – Digital Natives, Digital Immigrants; Engage Me or Enrage Me (Educause, 2005), educational games
- Jane McGonigal – Alternate Reality Games and Games for Change
-
- This study interconnects with two models to contribute to the validation of Schell's research
 - Jesse Schell's Elemental Tetrad Model (Schell, 2008)
 - Mihalyi Csikszentmihalyi's Flow Model (Csikszentmihalyi, 2008)

Theoretical Gap

- There is no validated model seems to define the characteristics and requirements for designing engaging and successful educational games.
- The characteristics for learning game design may seem mysterious and uncertain to curriculum designers.
- While models exist, research is needed to validate them.

Addressing the Theoretical Gap

- This research focuses on contributing to the validation of the Jesse Schell's Elemental Tetrad Model (2008) and examines the mental states noted in the Flow Model by Mihalyi Csikszentmihalyi (2008)
- The research design features four phases that
 - analyzes the intersections between the two models
 - examines the construct validity of Schell's model and whether Flow matters to game and learning game design,
 - analyzes the quantitative ratings by experts and gamers, and
 - proposes additional characteristics of interest to learning game design

Study Approach

- Develop a table that examines the Elemental Tetrad Model's Four Elements by Jesse Schell, and
- Examine the Flow Model's mental states by Csikszentmihalyi and their influence in Schell's elements
- Define a strategy for evaluating their use in two commercial games
- Develop a survey, administer it to experts and gamers, analyze the construct validity via the quantitative data and identify the additional characteristics that are important to learning game design.

Games

- **World of Warcraft** (Massive Multiplayer Online Role-playing Game MMORPG) by Blizzard Entertainment). WoW play involves completion of quests that reward the player with a combination of experience points, items, loot and in-game money. Quests allow the players to gain access to new skills and abilities, and to explore the game's environment.
- **Minecraft** (a popular game that is available for online download) was developed by Markus Persson (Notch) and later acquired by Jens Bergensten (Jeb) in 2011. Minecraft has a creative mode (often used by educators) in which gamers can construct and build castles and an environment similar to the construction capabilities noted in The Sims (by Electronic Arts) and in Second Life. For normal gameplay, it has a survival mode in which players need to harvest resources and where they experience threats to their survival.

Research Questions

- 1 What are the characteristics in the Flow Model and the elements in Schell's Elemental Tetrad Model that make these two commercial games engaging?
- 2 How do experts perceive the experience of Flow in the World of Warcraft and Minecraft?
- 3 How important are mechanics to learning game design?
- 4 How important is the story in learning game design?
- 5 How important are aesthetics in learning game design?
- 6 Is the role of technology important in learning game design?

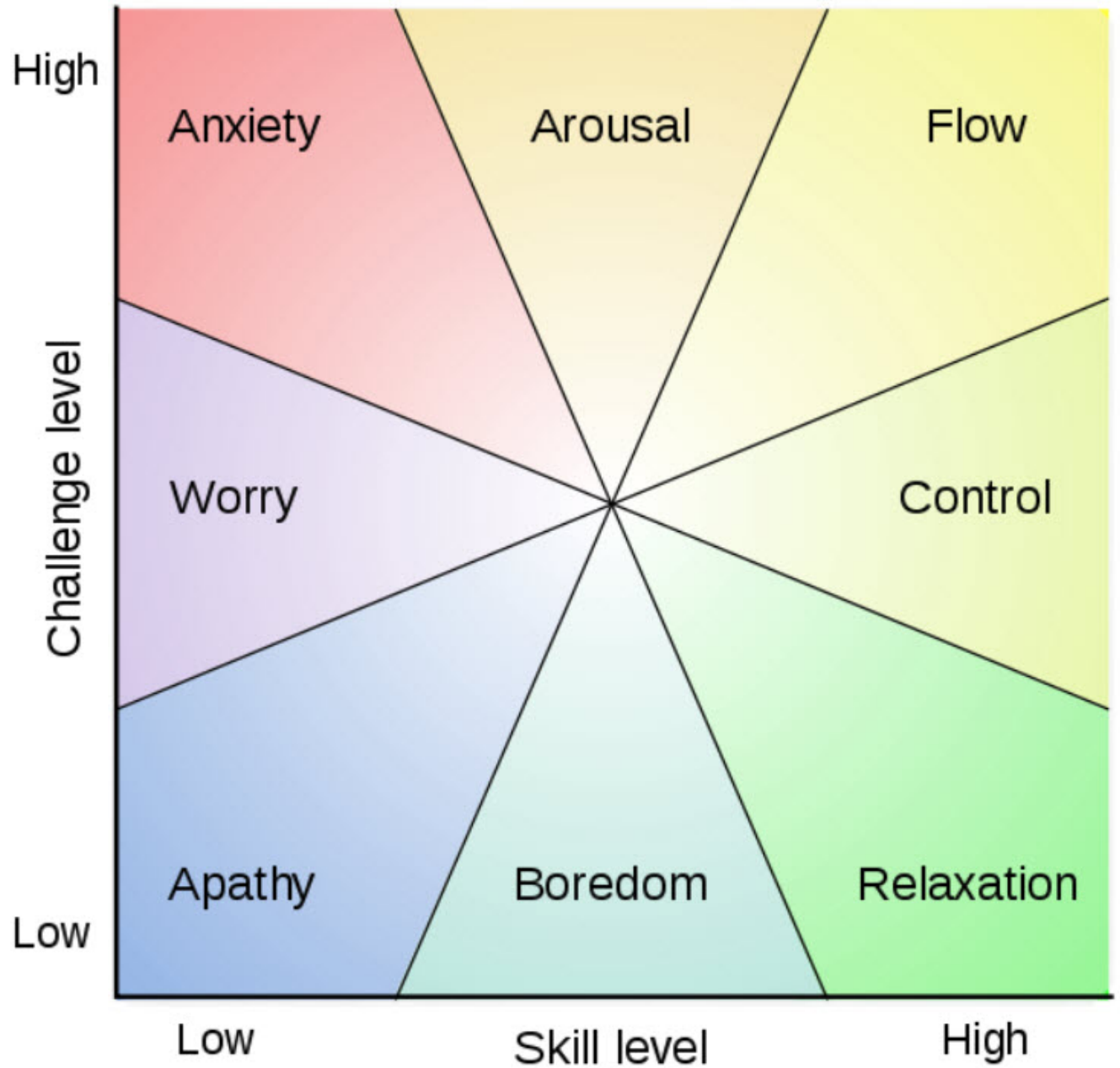
Research Methodology

- Uses mixed methods
- Examines the construct validity of the Elemental Tetrad Model in conjunction with Flow characteristics (mental states)
- Uses an embedded survey instrument that asks quantitative and qualitative questions to assess the construct validity
 - The experts had both expertise in curriculum design and expertise in either the World of Warcraft (WoW) or expertise with both WoW and Minecraft
 - The gamers had expertise in using WoW and in some instances, Minecraft
- Analyzes the qualitative data to identify the additional characteristics that are important to learning game design

Research Phases

Using a construct validity study in a mixed methods methodology

1. Explore the Elemental Tetrad Game Design Model & The Flow Model by Csikszentmihalyi to develop a table of their intersections
2. Develop the survey
3. Analyze the quantitative data collected during two waves of surveys from a) experts in curriculum design and expertise with WoW and/or Minecraft, and b) with gamers who play WoW and/or Minecraft
4. Analyze the qualitative data to identify additional characteristics



The Flow Model

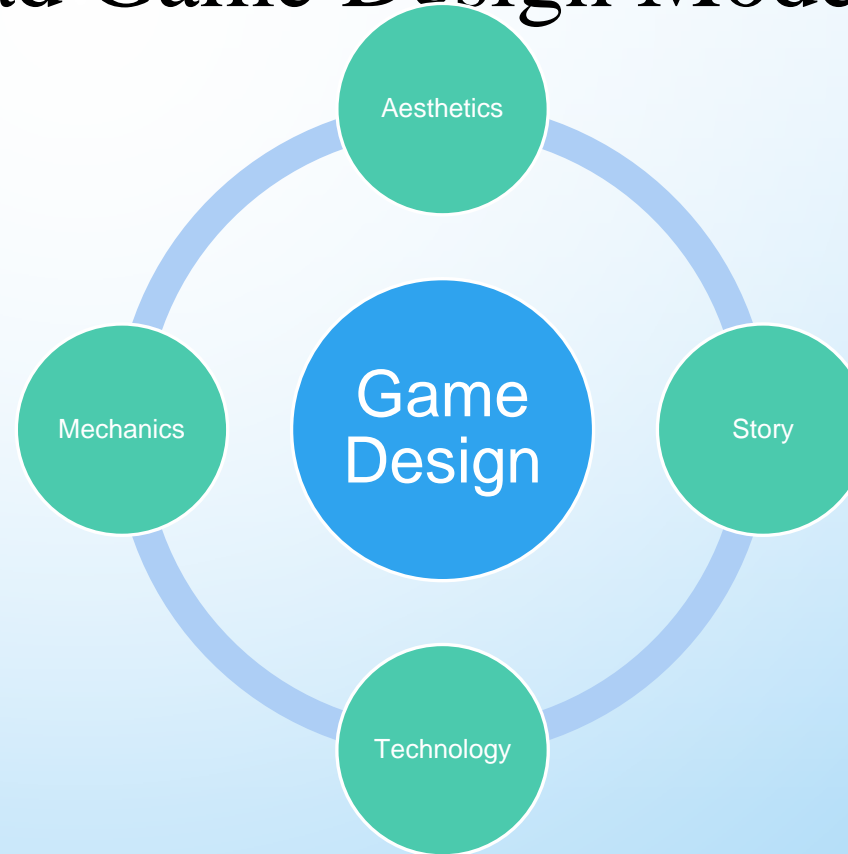
by

Mihalyi Csikszentmihalyi

Depicts the mental states

The Elemental Tetrad Game Design Model*

- Aesthetics
- Story
- Mechanics
- Technology



* The Elemental Tetrad game design model comes from Jesse Schell (*The Art of Game Design: A Book of Lenses*, 2008, Burlington, MA: Elsevier)

Applying Schell's Element Tetrad Game Design Model

- Use the events of the story and state the purpose of the game.
- Assess the features of game and how it correlates a relationship with the player's experience.
- Evaluate the human-computer interaction by using the game technologies.
- Make players feel immersed within the game-based environment
- Give extra points for level progression achievements

The next four slides illustrate facets of the Element Tetrad model

Mechanics

- Procedures and rules of the game
- Mechanics describe the goal of the game, how players can try to achieve it, and what happens when they try
- Main differentiator between games and linear entertainment experiences (books, movies, etc.)
- Technology is chosen that can support the mechanics, aesthetics that emphasize them clearly and a story that allows the mechanics to make sense.

(SCHELL, 2008)

Story

- Addresses the sequence of events in a game
- May be linear and pre-scripted or branching and emergent
- Mechanics are chosen to strengthen the story and allows the story to emerge
- Aesthetics are chosen to help reinforce ideas of the story and technology that is best suited to the story

(SCHELL, 2008)

Aesthetics

- How the game looks, sounds, smells, tastes and feels.
- Most direct relationship to the player's experience
- Technology is chosen that will amplify and reinforce aesthetics
- Mechanics are chosen that make players feel immersed in the world that the aesthetics have defined
- Story is chosen that allows aesthetics to emerge at the right pace and have the most impact

(SCHELL, 2008)

Technology

- Technology is any materials and interactions that make the game possible
- The choice of technology enables the game to do certain things and prohibits other things
- Technology is the medium in which the aesthetics take place, the mechanics will occur and through which the story is told

(SCHELL, 2008)

Flow Model	Mechanics	Story	Aesthetics	Technology
Excitement	Win conditions, conflict, tension, atmosphere	The levels that are reached and the journey of the character.	Constant level of immersion within a commercial game environment. Thus, making the player feel like they are apart of the virtual game world entirely. Having a single oneness with the game itself.	The characters can be enhanced with 2D or 3D graphics that can enhance the gamer's technological experience.
Arousal	Storyboards	The conflict situation or allusions within the characters of the game.	Direct -- sensory stimuli due to colors, images, sounds, feel of the game and its environment	The way the technology can be created or designed can create arousal with the gamer. Some of the video game characters are drawn from actual models and celebrities which can stir a stimulative arousal with a gamer.
Anxiety	Engagement	The many challenges levels or events can cause a player to be anxious. The player can also have a certain level of anxiety.	Defensiveness is a trait that can be developed by having to fight in fighting games a lot.	Technology can cause a gamer anxiety if they are obsessed with winning all the time. Being a sore loser will cause anxiety. The gamer may not be familiar with maneuvering the technology.

Flow Model Control	Mechanics Level achievements	Story When a gamer gets all the elements that has to be obtained. This is according to the story board to complete the entire game. The gamer feels a level of control,	Aesthetics Being a strong character in a game gives the game control within their minds.	Technology A gamer would have the feeling of control when they labeled as being tech savvy or an advanced gamer. This would help the gamer feel like they are in control of their game quest.
Relaxation	Board/level completion.	When a gamer gets to the final level of the game, the feeling of relaxation puts them more at ease.	When the level was accomplished, the gamer usually will feel relaxed and an ease of accomplishment.	Technology can seem relaxing during game play by the visual content. The 2D is a good multimedia graphic as well as the 3-D graphic. Some of the levels within the game according to design and scenery may cause relaxation to the gamer.

Flow Model
Boredom

Mechanics

Not mastering the events in the game level.

Story

The gamer can get a feeling of boredom when they do not master the game attainment goals. For instance, the story maybe too challenging for the gamer leaving them at a loss. As a result, the gamer continually lose a life or points.

Aesthetics

The gamer can feel this way if they keep losing numerous times within the same level or world.

Technology

Technology may very well cause boredom to the gamer. For instance, the gamer may have played the game numerous times before. Or the gamer may lose a lot because he/she may never have mastered the technology or the story of the game.

Apathy

Gamer just playing but not really feeling any emotion.

A game less interesting to the gamer may be selected to play just to have something to do. For example, a less interesting game opposed to the player's favorite game of interest will be selected when the gamer has time constraints. Playing this particular game would give the gamer something to do, causing them not to have any emotion about whether or not they lose levels within the game or not.

A gamer can feel this way when they may or may not have a huge interest in the game. They can be playing the game just to pass the time.

The gamer may feel less emotional about new emerging technologies. Some gamers feel like if you've played one game, you've played them all. This will make the gamer feel more apathetic and not having much emotion when interacting with the gaming technology. The gamer would feel apathy and have little interest in the game entirely.

Survey Questions - Demographics

Years of experience with

Experts: World of Warcraft ___6___

Minecraft ___5___

Gamers: World of Warcraft ___4___

Minecraft ___2___

Years of experience in teaching

K-8 ___3___ 6-8 7 ___ 9-12 ___1___ Higher Education ___10___

Years of experience in curriculum design

1-3 ___1___ 4-6 ___1___ 7-9 ___0___ 10-12 ___2___ 13+ ___1___

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Years of experience in curriculum design

1-3 ___1___ 4-6 ___1___ 7-9 ___0___ 10-12 ___2___ 13+ ___1___

Game Mechanics: Questions 5-7

Game Mechanics: Statistical Mean in the World of Warcraft

How important are the game's rules to support the learning activities?

Experts 3 Gamers 3

Is the same feedback that learners receive from a game quest useful when repurposing the game for learning?

WoW Experts 2.83 Gamers 3

Are the learning outcomes measurable within the game?

WoW Experts 2.5 Gamers 2.5

Story: Questions 8-11

- How important is conflict in the game for the learner to feel excited? Experts 3 Gamers 3.75
- Does the use of game violence contribute to the learning experience? Experts 2.16 Gamers 1.75
- Is the feeling of game immersion that is experienced during quests within the game contributing to the learning experience? Experts 3.83 Gamers 4
- Does the story in the World of Warcraft offer opportunities for learning activities? Experts 3.5 Gamers 4

Aesthetics: Questions 12-16

- Are the quality of the game's visuals required for the game to be engaging as a learning environment? Experts 3.16 Gamers 3.25
- How important is it that the graphics foster an immersive game experience? Experts 3.33 Gamers 3.25
- How important is sound feedback, (such as beeps, alerts, spell effects and game sounds), to an engaging learning game? Experts 3.16 Gamers 3.25
- How important is the music soundtrack in generating an engaging play experience? Experts 3.16 Gamers 3.00
- Is the learning experience enhanced by the game's music soundtrack? Experts 2.83 Gamers 2.25

Technology: Questions 17-19

- How important is the quality of the visuals within the game (2D vs. 3D) to the quality of the learning experience? Experts 3.33 Gamers 3.00
- How important is faster equipment processing speeds to learning? Experts 3.166 Gamers 3.5
- Does the mobile version of Minecraft offer the same learning opportunities as the desktop versions? For Minecraft -- Experts 2.33 Gamers 4

Correlation Coefficient for the Construct Validity Study

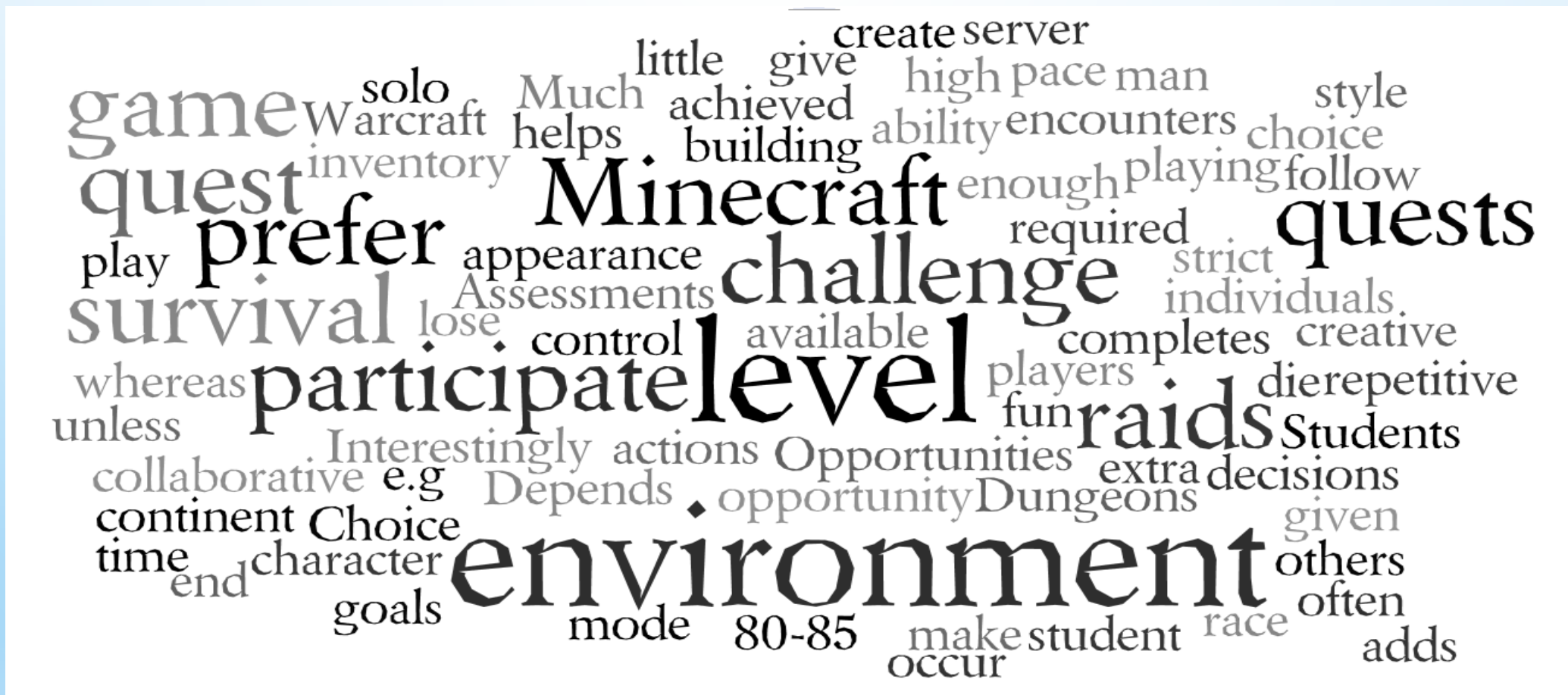
The correlation analysis of the two commercial games is based on the perception of Schell's Model in the design of representative categories of games for commercial non-education use & designed for education use.

Experts and Gamers	Mechanics	Aesthetics	Story
Correlation Coefficient	0.94	0.92	0.96
Strength in Agreement	High	High	High

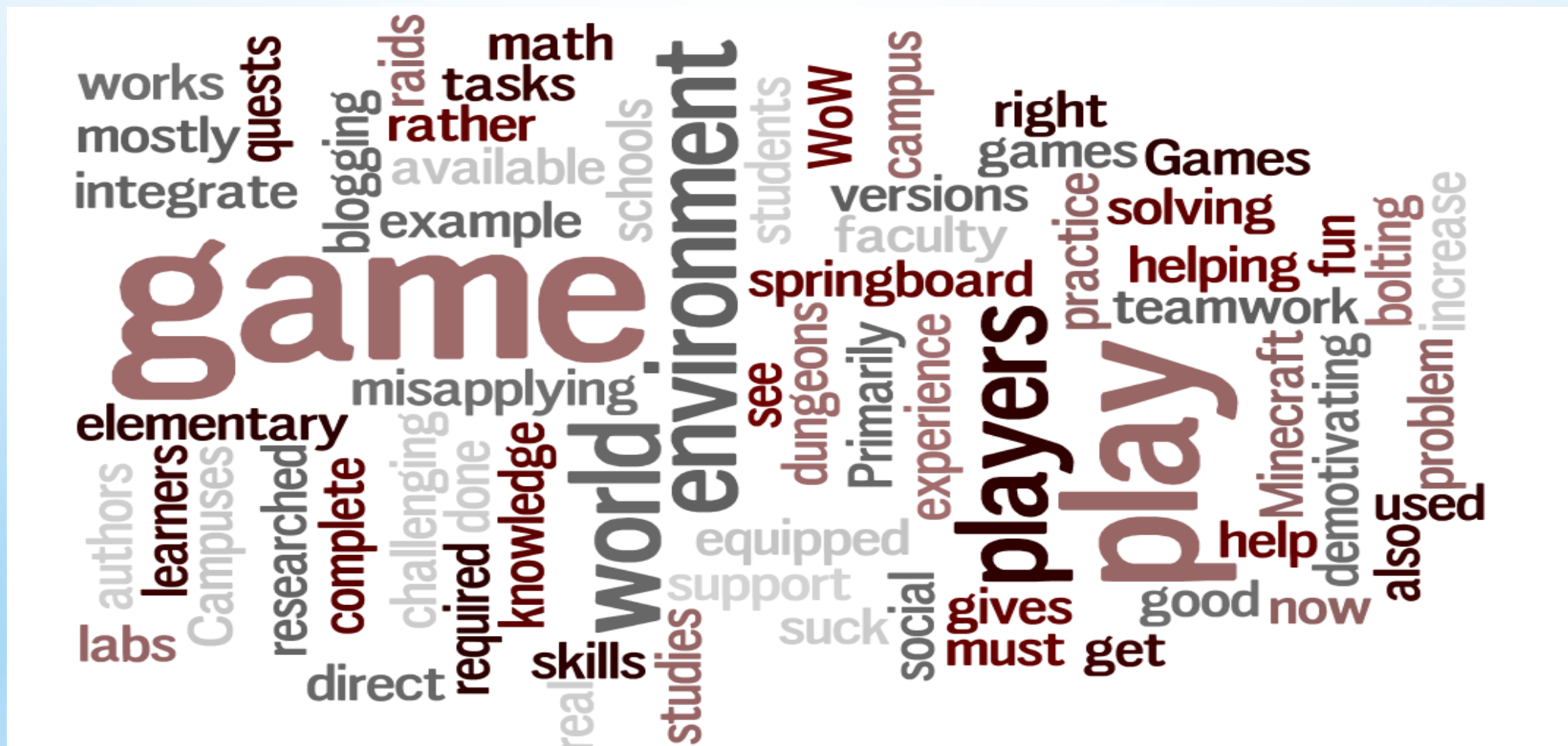
Survey of Game Technologies Used

- PC
- Mac
- iPad
- iPhone
- Droid
- Tablet
- Linux

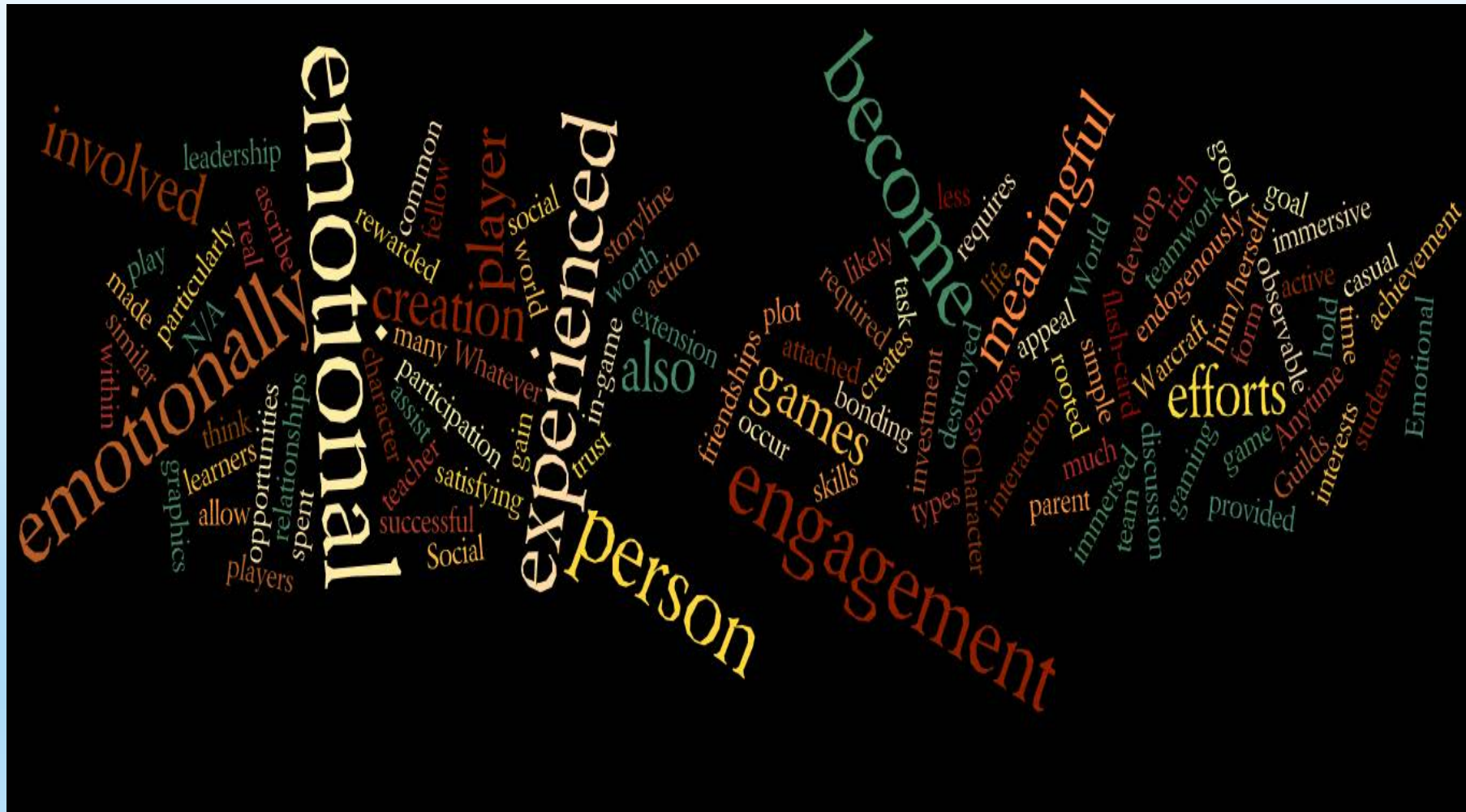
Q19: How does game-based learning through the use of the World of Warcraft and or Minecraft give the student control over their learning experience? Gamer responses



Q21: How does game-based learning through the use of the World of Warcraft and/or Minecraft give the student control over their learning experience? Gamer responses

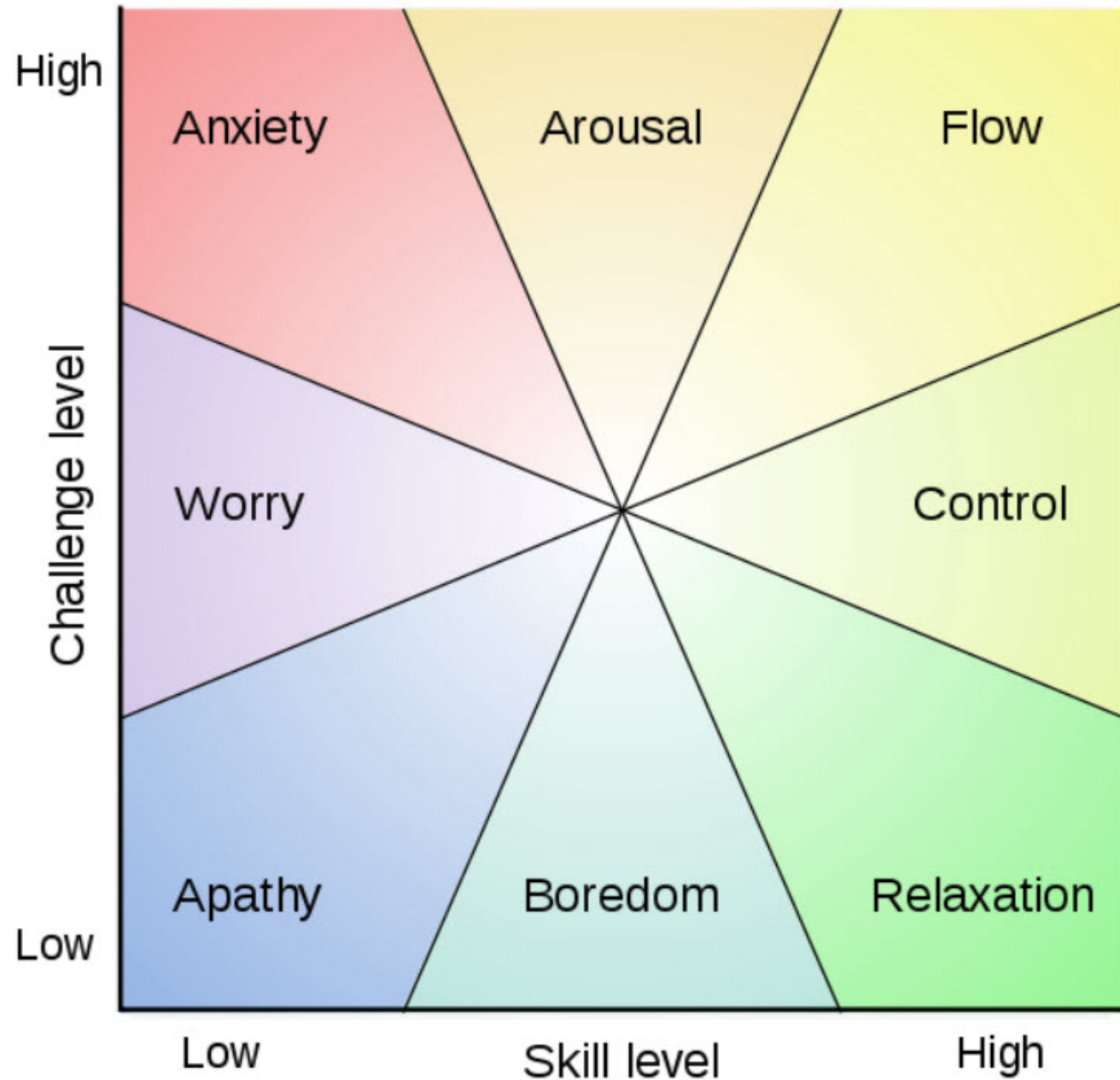


Q24: Are there any features in the World of Warcraft and/or Minecraft that will enhance the emotional engagement for learners.



Q25: What are the features that are needed in learning games that are not available in either the World of Warcraft and/or Minecraft? Expert responses





Not all of the mental states were noted as important in the study

In particular, boredom and relaxation were not noted by the experts and gamers in the qualitative data

Csikszentmihalyi, 2008

New Contributions

- Support the validation of the Elemental Tetrad Game Design Model and how it intersects with the mental states in the Flow Model
- Study the use of the Elemental Tetrad Model within WoW, and to a lesser extent, Minecraft
- Identify the additional characteristics that are important to learning game design

Areas for Future Investigation/Research

- Extend the learning game design characteristics and apply them to the design and assessment of educational games
- Assess the importance of Flow and these additional learning game design characteristics to identify specific features and styles within learning games
- Increased use of learning game design in education for both campus and online learning.
- The design of learning games that include a sandbox or creative mode as well as collaborative and constructive play styles.

Conclusion

- Thanks for attending, Are there any questions?

References

- Csikszentmihalyi, M. (2008) *Flow: The psychology of optimal experience*. New York, New York: Harper-Collins Publishers, Inc.
- Gee, J. P. (2013). Publications. Retrieved April 6, 2017 from <http://www.jamespaulgee.com/publications>
- Gee, J.P. (n.d.). James Paul Gee Bio. Retrieved April 6, 2017 from <http://jamespaulgee.cgpublisher.com/>
- McGonigal, J. (2013) Bio. Retrieved April 6, 2017 from <http://janemcgonigal.com/meet-me/>
- Prensky, M Website (2012). <http://www.marcprensky.com/>
- Reeves, T. C. (n.d.). Professor Thomas C. Reeves. Retrieved April 6, 2017 from <http://treeves.coe.uga.edu/>
- Schell, J. (2013) Author Bio. Retrieved April 6, 2017 from <http://artofgamedesign.com/bio/>
- Schell, J. (2008) *The Art of Game Design: A Book of Lenses*, Burlington, MA: Elsevier
- Worldle Website (2013) Visual Word maps. Retrieved April 6, 2017 from <http://www.wordle.net>



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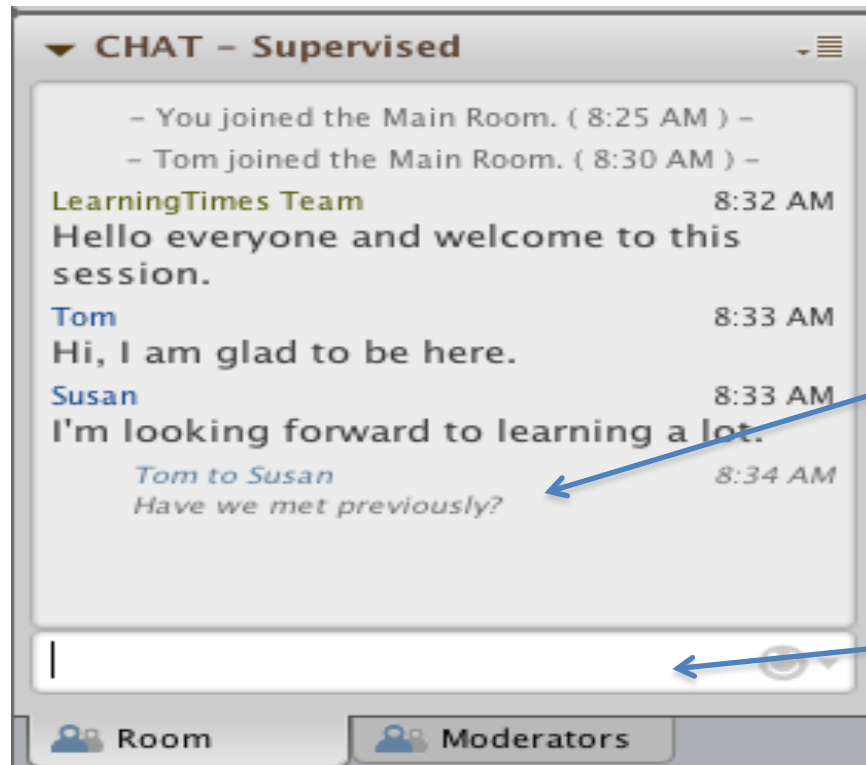
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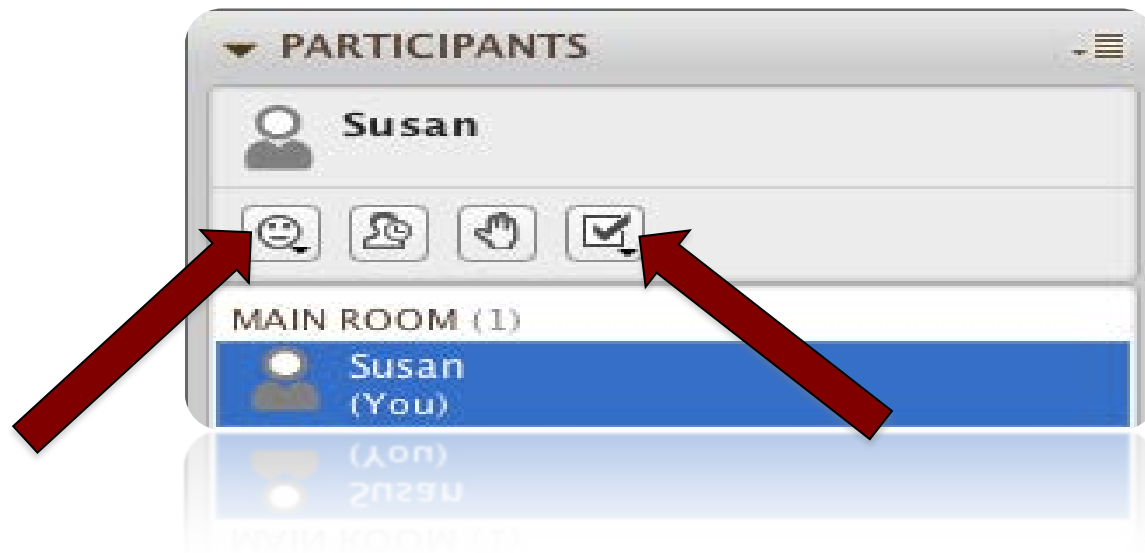
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Type your message here and press Enter to send.

Polls, smiles and handraising





You have a voice!

Audio Setup Wizard



Click on the Talk button. We won't be using Video.