Considering a Reboot:

Using Design-Thinking Strategies to Maintain a Dynamic, Industry-Relevant, Game Design Curriculum

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Abstract

The continuing growth and popularity of video games and the game design industry has fueled a comparable emergence of video game design programs at the university level in the 21st century, producing graduates specifically trained to enter the game design field. However, academic institutions have been challenged to maintain curriculums that can keep pace with the innovations of this dynamic and competitive industry. To date, very little research exists to guide administrators in methods to track and relevantly respond to these technological and market changes. Using Design-Thinking strategies, we explored ways in which academic programs can identify and adapt to the changing needs of game design companies and train their students in the necessary technological proficiencies and skillsets to successfully enter the industry. Opinions and perspectives were gathered from three groups of shareholders: game design students, professionals in the game design industry, and the game design faculty at a private university. An analysis of data drawn from Affinity Clustering, Visualize the Vote, Interviews, and Round Robin exercises resulted in two posters, one illustrating 10 categories of necessary skill sets and proficiencies, the extent to which the program fulfills each one, and a second poster profiling the ideal game design graduate. While the methods were successful in identifying areas of program strengths and weaknesses, further exploration using Design-Thinking strategies to address limitations is recommended.

Acknowledgments

To the Interactive Media faculty at Bradley University, thank you for your collegiality, time, and assistance in making those critical industry contacts and for letting me hang out with your game design students for a while. They're pretty cool. To my Radford family, including thesis committee members Dr. Joan Dickinson and Ms. Kathleen Sullivan, thank you for your inspiration, wonderful critiques, and dedication to teaching the innovative discipline of Design-Thinking. To Dr. Bruce Parsons, my thesis committee chair, thank you for your superhuman patience, guidance, good humor, and encouragement. And for helping me with those cool graphic things. Finally, to Elizabeth Bauer-Marsh, thank you for your love and support. No one ever had a better partner, best friend, sounding board, wordsmith, and constant cheerleader.

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Introduction

Fueled by competitive console gaming innovation, streaming services, smartphone technology, emerging fields such as E-Sports, and an estimated 2.5 billion gamers around the world, the video game industry is projected to grow to over $300 billion in revenues by 2025 (Lanier, 2019). Driven by this dynamic industry, colleges and universities have responded with commensurate growth in game design undergraduate and graduate programs. As the industry has enjoyed unchecked growth and expansion since the end of the 20th century, it is now experiencing through mergers and acquisitions as well as pressure to maximize profit margins a slight decline in the number of design studios, meaning greater competition for jobs in the industry, and a greater need for well-prepared graduates from college design programs.

University programs themselves are under pressure to produce graduates who meet the expectations of a continuously evolving industry and to demonstrate to potential student recruits the effectiveness of their curriculums to empower them with the knowledge and skillsets necessary for successful job placement after college. A program considered cutting edge one year may find itself stagnant in a very short time if it does not faithfully consider its responsiveness to the industry's ever-changing needs (Bourdreaux et al., 2011; Princeton Review, 2020).

A Design-Thinking approach to assessing the value of a college program to students—as well as the value of a program's graduates to game design studios—may provide unique and relevant insights for creating and maintaining competitive undergraduate game design programs. Such an approach may inform curricular formation and ongoing development by beginning with a simple question: What are the

qualities, knowledge, and skill sets perceived to be the most important to undergraduate game design students, game design faculty and administrators, and professional game creators in the game design industry?

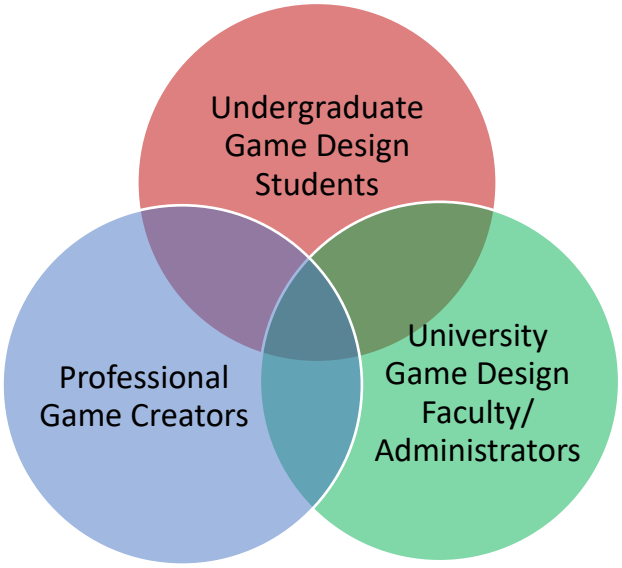


Figure 1. The converging perspectives and interests among game design stakeholders.

Employing Design-Thinking research strategies among these three primary stakeholders should identify areas of agreement as well as divergence and result in a Venn diagram "snapshot," which in turn could focus educators' curricular objectives to meet the needs of both their students and the game design industry.

Purpose

The purpose of this research study is to identify and articulate what qualities, knowledge, and skill sets are considered most valuable among three sets of stakeholders related to the game-design industry: university-level game design educators (faculty and administrators), professional game creators, and undergraduate game design students. Each group represents unique perspectives and interests with regards to the curricula and objectives of game design programs. Game design educators and administrators understand that the marketability of their own programs is linked to the ability of their graduates to be successful in the industry. Professional game creators are looking for potential employees who are prepared to add value to their own organizations and see greater value in top-ranked programs that consistently produce skilled graduates who can add immediate value to the organization. Students seeking game design degrees search for programs that demonstrate a strong connection to the industry as well as a strong track record of placing graduates in those coveted positions.

As each stakeholder group shares similar or closely related priorities for design programs and their graduates, the groups themselves are often siloed with little interaction or discussion around the topic of curriculum development. For this reason, it is essential for the groups to be concurrently engaged in this research. The values and viewpoints of each group will provide rich insights for collaborative exercises as well as acting as a check on each perspective set's interpretation of the other two groups' priorities.

While a great deal of research has focused on the dynamic and evolving nature of the game design industry (Frost, 2018; Koksal, 2019), relatively few have looked at the

more static process of curriculum development and skill prioritization to meet those evolving needs within the industry. Using the Design-Thinking strategies of Interviewing, Affinity Clustering, and Visualize the Vote, we discovered areas of agreement as well as divergence regarding the perceived importance of these skill sets among the stakeholder groups. Data gathered was synthesized for the purpose of facilitating ongoing conversations that could then produce curriculums responsive to the dynamically changing game design industry.

Definition of Terms

Advergame

A digital game specifically designed for the primary purpose of advertising and promotion of an organization's product, service, or brand played via the Internet or on a compatible medium via games disc or digital download (Smith et al., 2014).

Advertising

The (traditionally) nonpersonal communication of information usually paid for and usually persuasive in nature about products, services, or ideas by identified sponsors through the various media (Bovee & Arens, 1992). The development of digital media and content delivery has channels provided by advertisers with the ability to better tailor messages and more specifically target audiences based on their unique characteristics (e.g., demographics, media consumption, and consumer purchasing behaviors) (Katz, 2016).

Affinity Clustering

The Design-Thinking strategy that seeks to reveal patterns by grouping similar data points, for the purpose of identifying commonalities "inherent, but not necessarily obvious" (LUMA Institute, 2012, p. 40).

Around-Game Advertising

Advertising and promotion linked to video and computer games through non-intrusive around-game displays or licensing of game branding with associated third-party products (Smith et al., 2014).

Brand Integration

An extension of product placement sometimes referred to as content integration. A more holistic experience created with the brand that involves creation of unique content specifically for that brand.

Bull's-eye Diagramming

A technique for gathering data sets and assigning prioritization by plotting specific items or ideas on a bull's-eye consisting of three concentric circles. Each successive circle is larger than the bull's-eye, forcing consideration as to what items/ideas may be critical, important, or merely peripheral (LUMA Institute, 2012).

Convenience Sampling

Drawing from a sample of a population that is easily accessible (Fraenkel et al., 2012).

Engagement

An indication of game involvement by a player, often described on a continuation of psychological absorption (Brockmyer et al., 2009).

Frequency

How many times an audience is potentially exposed to a specific advertisement (Katz, 2016).

Game Advertising

The association of marketing communications messages with video and computer games to target consumers through Advergames, Around-game Advertising, or In-Game Advertising activities (Smith et al., 2014).

Heuristic Evaluation

Evaluative exercise in which a checklist of elements is employed to illuminate areas of strength or weakness in a design or process (Tomitsch & Borthwick, 2020).

In-Game Advertising

The integration of non-fictional products and brands within the playing environment of video and computer games through simulated real-life marketing communication mechanisms (Smith et al., 2014).

Interviewing

A technique for gathering information through direct dialogue (LUMA Institute, 2012).

Medium

A means of communicating messages; the means by which something is accomplished, conveyed, or transferred. **Media** (plural) fulfill the needs for entertainment, information, and/or social connectivity. In advertising, **medium** may refer to a class of carriers (TV, radio, newspaper) (Katz, 2016).

Monetization

In video games, revenue streams from game sales and in-game advertising, as well as revenue-generating strategies that incentivize players to make additional purchases, including microtransactions, loot boxes, and battle passes.

Product Placement

Advertisers pay program producers to put their brands into the storylines or content carried by a medium (TV shows, video games).

Reach

A measure of audience accumulation; the number or percentage of people in the target audience who will be exposed to the medium where an ad appears; concerned with vehicle exposure, or the *opportunity* to see the ad (Katz, 2016).

Survey Research

An attempt to obtain data from members of a population (or a sample) to determine the current status of that population with respect to one or more variables (LUMA Institute, 2012).

Vehicle

An individual carrier within a medium (Family Guy, Sports Illustrated, NY Times) (Katz, 2016).

Video Game

An electronic game that involves interaction with a user interface to generate visual feedback on a two- or three-dimensional display device such as a TV screen, virtual reality headset, computer monitor, or smartphone/tablet.

Visualize the Vote

A group activity in which participants individually evaluate and prioritize parts of a data set by awarding a limited number of tokens to those items (LUMA Institute, 2012).

Review of Literature

For nearly 60 years, perhaps the most remarkably consistent facet of the video game industry has been its ability to be underestimated, derided, and often dismissed entirely, even by those observing from within the field. In 1979, Arcade, Inc. executive Gus Bally declared, “People won’t want to play these electronic games for more than a week . . . not once we start selling pinball machines for the home” (Frost, 2018, para. 3). Since the premiere of the first mainframe game Spacewar! in 1962, video games have grown from a technological novelty designed in physics labs to being labeled an “art form for the digital age” (Jenkins, 2000, p. 29). Long-derided as low art or mistakenly pigeonholed as children’s entertainment, video games have begun receiving more attention for their cutting-edge graphics, engagement across nearly all demographics, cultural impact, and even literary merit.

> . . . it’s hard to imagine how you could opine on the future of literature without having played the brilliantly characterful and fourth-wall breaking *Portal*, the somber and engrossing *Papers, Please*, or the dazzlingly surreal exploration of the American subconscious, *Kentucky Route Zero*. Are you interested in discussing experimental “read it in any order” literature? Then for goodness’ sake, play the mystery narratives of *Her Story* and *Gone Home* and the hilarious and unsettling *The Stanley Parable*. If you want to talk about how writers can engage with politics, capitalism, or the environmental movement, you’ll be showing your ignorance if you haven’t played *Oiligarchy.* (Alderman, 2013, para. 7)

The above examples demonstrate the maturation of video games from science fiction and combat-inspired contests to interactive treatises on broader societal issues such as economic inequities, disenfranchisement, and ecological devastation highlighted in *Kentucky Route Zero* and *Oiligarchy* (Scaife, 2020). This discourse has been further elevated by long-form episodic arcs driven as much by the narrative choices made by the games' players as the game creators themselves. Cinematography-quality graphics surround players in "walking simulators" designed to be experienced more as immersive novels to be quietly savored and contemplated as in *Gone Home,* than a spectacular pulse-pounding firefight in *Halo* (Carpenter, 2019).

Figure 2. Portal is a spatial novel created for the computer.

Figure 3. The award-winning border simulation *Papers, Please*.

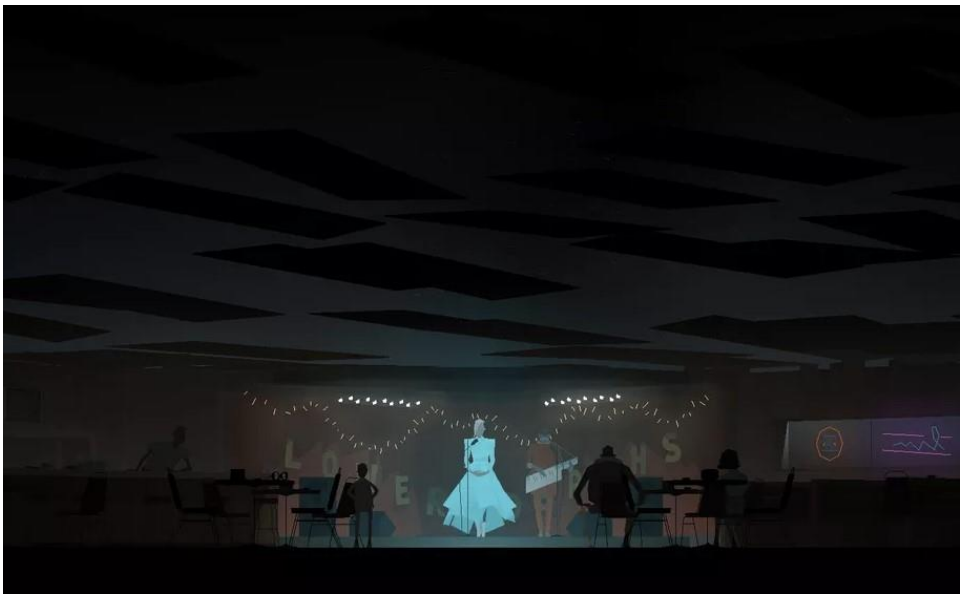


Figure 4. The quiet, dystopian outrage of *Kentucky Route Zero*.

Figure 5. War, politics, and energy in the sim world of *Oiligarchy*.

Indeed, the industry's growth and popularity support the argument that video games are the most dominant popular medium when compared to other entertainment platforms. In a 2000 survey, 35% of American adults reported video games as being the "most fun" entertainment activity (television was second with 18%) (Newman, 2013). Since the late 1990s, U.S. video game revenues have exceeded domestic film box office sales, and in 2016, the video games industry reported global revenues of $101 billion, eclipsing the combined revenues generated by the music and film industries ($16 billion and $49 billion, respectively) (Malim, 2018). By 2018 that figure had increased to $131 billion, with some forecasting the video game industry reaching $300 billion in revenues by 2025. Those estimates are driven by the increased prevalence of high-speed 5G data networks, innovations in Virtual- and Augmented-reality, the continued rise of mobile gaming, and cloud-based gaming not dependent on PC or console platforms (Lanier, 2019; Shah, 2019).

While video games have traditionally been, and remain, more popular among younger demographics, a 2018 Pew Research study found that 43% of U.S. adults (aged

18+) report they often or sometimes play video games on a computer, TV, game console, or portable device such as a cellphone. Of respondents aged 18-29, more men (72%) reported playing video games than women (49%) of the same ages (Pew Research Center, 2018). Audiences will continue to grow as game creators design content that can move seamlessly across multiple platforms, consoles, and devices. This will break down "walled gardens" and foster the formation of larger gaming communities. As Epic Games founder and CEO Tim Sweeney predicted, "Gaming will be as much a communication platform as an entertainment experience" (Graft, 2020, para. 4). This assertion is evidenced by Discord, a video-and-voice chat app that began in 2015 as a platform for gamers to communicate more easily while participating in video games. The app has now expanded its brand and utility beyond the gaming community, attracting over 300 million registered users to include non-gamer groups like book clubs, teachers, and Scouts who use the video-chat platform to communicate formally and informally during the COVID pandemic (Brown, 2020; Chalk, 2020). While Zoom became the more widely used platform for education and business during the COVID pandemic (300 million active daily users to Discord's 14 million active daily users), the platform created to meet the needs of the gaming community boasts significant advantages in user experience (Cardos, 2020). Interests outside of the game industry are also leveraging the ubiquitous appeal of gaming platforms as foundations for social marketing campaigns. The interactive nature of games has been found to provide a more efficient means of enacting attitudinal and behavioral change among teens regarding issues such as alcohol use (Russell-Bennett et al., 2016). Games have been valuable to underscore course curriculum development. Lee et al. (2020) examined the first high school curriculum

taught using esports as its cross-disciplinary platform. Researchers have illustrated the necessity for educational game designers to understand the larger gamer culture outside of the classroom when designing educational games for inside the classroom; students may be more motivated to learn how to advance through the game than learning about the content of the game (Chmiel, 2012).

Most Popular Video Game Genres

As technological advancements lower barriers to participation, widening audience size and diversity, the video game industry has seen the emergence of an equally diverse number of game genres. Jones (2019) broke down the most popular genres as:

Racing: players navigate tracks, streets, and other terrain to be the first to cross the finish line. Example: Mario Kart

Fighting: players exchange blows to harm or otherwise weaken opponents' health reserves. Example: Super Smash Bros Ultimate

Simulation: using tools available in each game, players create realistic characters and gamescape environments. Example: The Sims

Sandbox/Open World: players enjoy free-roaming ability in a non-linear gamescape featuring tasks and unrelated storylines. Example: Grand Theft Auto

Action/Adventure: established and elaborate gamescapes with fully developed characters and storylines. Example: The Legend of Zelda

Sports: Reality-based sports built around real teams and athletes in single- or multi-player games have led to the rise of the eSports industry. Example: NBA 2K19

eSports: International organized competitive gaming across a variety of genres (First Person Shooter, Multiplayer Online Games, etc.). Participants train mentally as well as physically for events facilitated through human-computer interfaces (Adams, 2019). Example: League of Legends World Championship

First-Person Shooter (FPS): Immersive genre in which the player operates from the character's first-person perspective. Games usually follow a linear storyline. Example: Call of Duty

Battle Royale: Several combatants fight until one player remains. Example: Fortnite

Role-Playing Games (RPGs): Detailed storylines and complex decision-making tasks create a multitude of developing stories. Example: The Elder Scrolls: Skyrim

Massively Multiplayer Online Games: Thousands of players playing simultaneously in the same game on the same server, competing against and sometimes collaborating with each other. Example: World of Warcraft (Jones, 2019).

Evolving Trends and Emerging Revenue Models

As rapidly as the industry's design trends develop and change, so do the revenue-generating models employed by game designers. There currently exist three predominant models: Free-To-Play with in-game purchases, Subscriptions, and In-game Advertising (Koksal, 2019).

The past decade has witnessed a shift from revenue derived from purchases of physical equipment (consoles, game disks, cartridges) to players buying digital downloads. Concurrently, more players are engaging on mobile devices than PCs or consoles, furthering this trend (JLou, 2018; Koksal, 2019).

Free-To-Play games have amassed tremendous popularity, as players sign up for free, and then make in-game purchases such as cars, weapons, character outfits, and "skins." These purchases are also referred to as "micro-transactions." In 2018, nearly half of Fortnite's $2.4 billion in earned revenue came from in-game purchases (Koksal, 2019). Gaming subscription services are available in two basic forms: single-game subscriptions and service subscriptions. Single-game subscribers have access to in-game purchases for a monthly or annually renewable fee. Service subscribers pay fees for access to a larger number of games owned or licensed by a larger organization such as Apple Arcade, Google Play Pass, Xbox Game Pass, and Nintendo Switch Online. The cost for these services may range from $4.99 to $14.99 monthly, and annual subscriptions of $29.99 for basic access to $179.99 for premium benefits (Rosenberg, 2020).

Game advertising has grown in popularity in recent years as a way to underwrite the cost of game development that would otherwise be passed on to players. There are three kinds of advertising models associated with video game design: Advergames, Around-Game Advertising, and In-Game Advertising. Game Advertising was defined by Smith et al. (2014) as the association of marketing communications messages with video and computer games to target consumers (p. 97). Advergames are games designed around a brand, product, or service for the purpose of generating a direct response lead or otherwise creating a positive brand experience for a player. In-Game Advertising may be either marketing displays (static or dynamic) or a form of Product Placement, in which a non-fictional brand is integrated into the game.

Around-Game Advertising takes the form of Banners, Cross-Promotion, Interstitials, or Sponsorships. This category of Game Advertising is distinct from the other two in that it does not interfere with or detract/enhance from the playing of the game itself (Smith et al., 2014).

Traditional mainstream marketers and corporate sponsors are finding the massive popularity of gaming and eSports to be impossible to ignore, with worldwide real-time audiences for the largest events exceeding 200 million (Ringsted, 2019). Additionally, gaming has distinguished itself from other social media platforms (Facebook, Twitter) as an engaging and even uplifting social platform, emerging as a more favorable and positive social *hobby*, bridging lifestyle, gender, geographic, and generational gaps (Nierenberg, 2020).

Training Modern Game Designers

As architects of a relatively young medium, early game developers migrated to the industry from a variety of backgrounds, including computer science, sociology, and media studies. Since the explosion of university courses and undergraduate degrees in game design in the early 21st century, graduates enter the field as video game specialists, trained in the study and critical analysis of interactive media and game design (Zagal & Bruckman, 2008). Today's graduates will have completed fully developed coursework in graphic design, animation, visual storytelling, storyboarding, and creative writing (The Princeton Review, 2020). Additionally, contemporary curricula have focused on and been driven by technological advancements in areas like 2- and 3-D graphics, virtual reality, and augmented reality. Potential employers would expect entry-level employees to be proficient in game analysis, programming, design, and development (Zagal & Bruckman, 2008), but also have an understanding of the organization's

challenges and opportunities, as well as being able to work collaboratively within diverse groups and possess effective communication skills (Benamati, 2010; Harrison, 2017). Additionally, as games have become significantly more social in nature, game developers must have sufficient skillsets in social media networking to remain competitive (JLou, 2018).

The Knowledge and Skills Gap

The dynamic nature of the video game design industry has presented university programs with the unique challenge to graduate a workforce immediately ready to meet the needs of employers. Evolving technology and changing business and revenue models have resulted in a perennial gap between the tools entry-level designers possess, and the tools employers need. Previous studies have found U.S. tech and information system firms articulating a number of skills perceived to be lacking in entry-level college graduates, including commercial knowledge, leadership and collaborative skills, and business domain knowledge (Benamati, 2010). Contemporary research results in similar findings, as employers reported dissatisfaction with recent graduates' commercial awareness, negotiating, and leadership skills. There also exists a mismatch in the importance placed on certain skill sets, with students ranking lower the qualities of data skills and resilience, while employers ranked those qualities much higher (Study International Staff, 2019).

From the academic perspective, input from professional game creators and industry organizations was consistently reported as valuable in creating and maintaining design curriculums that produce employable game design graduates (McGill, 2012). That a collaborative relationship between industry and the academy is essential in addressing these gaps is clear; partnerships are more likely to be instigated by business interests than

by educators. Rybnicek and Königsgruber's (2019) systematic review of literature established the widespread use and impact of industry-university collaborations to advance the interests of business with regard to innovation and progress. Such collaborations are often sought more out of circumstantial necessity by business and entrepreneurial interests than proactively by either private interests or academia. This ad hoc approach may result in unsatisfactory interaction with educators, and a general disdain toward academic game design programs and the training they impart to students in game design programs (Bowtell, 2014). Willness and Bruni-Bossio (2017) prescribed a Design-Thinking approach to establish a practical standard for experiential academic and business collaborative engagement for the purpose of involving students with organizations and the surrounding community. The authors suggested that the iterative, human-based approach leveraging partnerships with external stakeholders will help guide academic business programs, and help students acquire and apply skills and knowledge necessary to be valuable to employers after graduation.

Each of these approaches recognizes the challenges academic programs face in creating programs reducing the knowledge and skills gap frustrating key stakeholders. However, the literature review reveals a dearth of research attempting to identify those best practices between academia and the industry of game design. Additionally, no research was found that also incorporated the perspective of game design students to supplement the collaboration between game industry professionals and game design faculty. This research aims to fill that gap.

Research Question

How might we use Design-Thinking strategies to develop and maintain a rigorous academic game design curriculum that serves the interests of key stakeholders in a creative and ever-changing industry?

Methodology

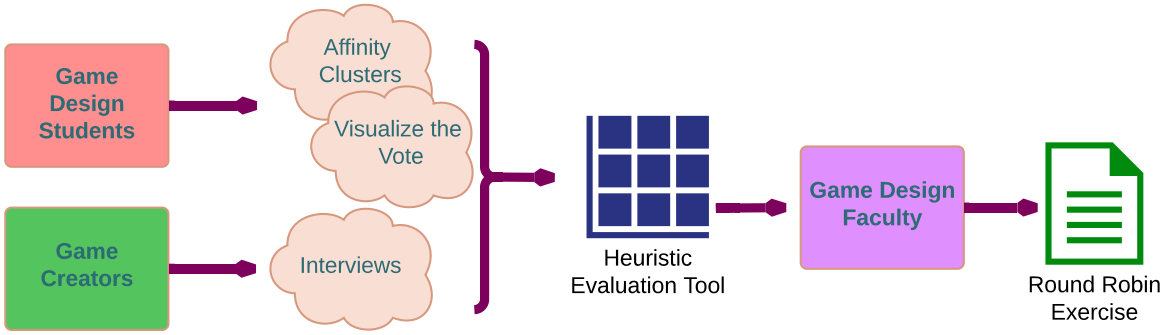
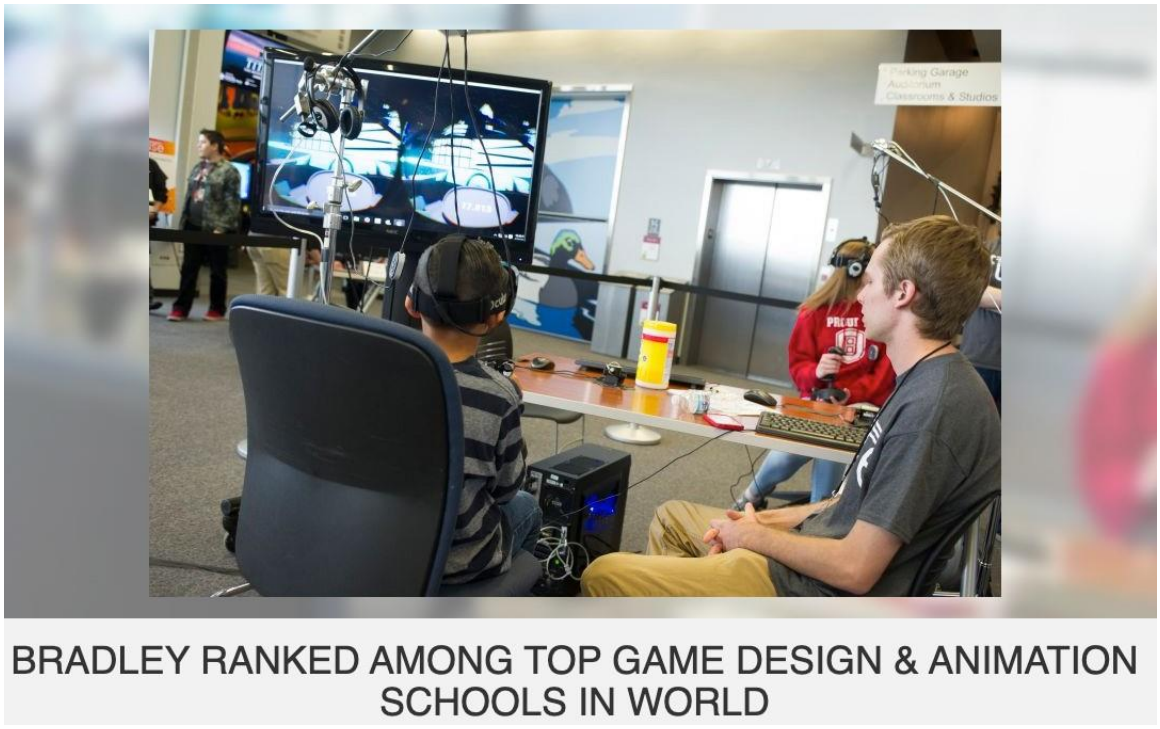


Figure 6. Progression of research methods.

COVID Protocol and Procedure

The Design-Thinking research was conducted in three phases. For the first and third phases, which were conducted in-person, all COVID protocols were observed. As of August 2021, Bradley University administration had lifted COVID restrictions on the number of persons permitted within a defined space, but masks remained required indoors on campus. The Affinity Clustering and Visualize the Vote exercises were conducted in a 25-seat classroom at Bradley University (see Figure 6). The Round Robin exercise in the third phase was conducted in an Interactive Media faculty conference room, which can accommodate up to 10 persons.



Phase I Procedures: Game Design Students

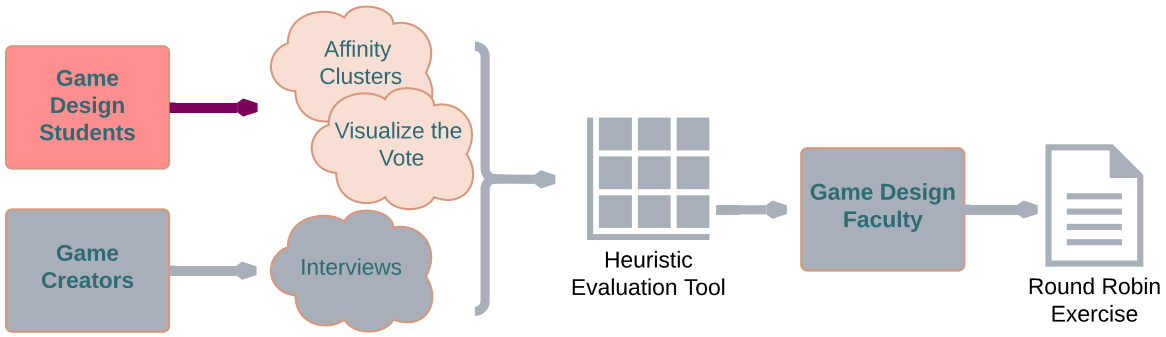


Figure 7. Phase I research procedures.

This first phase of data gathering consisted of two steps: Affinity Clustering followed by Visualize the Vote. These exercises were chosen to identify and prioritize those curricular learning outcomes perceived to be most important by senior-level game design students.

The first step of research utilized Affinity Clustering to identify those skill sets believed to be most prevalent within Bradley University's Game Design program from the perspective of senior-level students about to complete the program's plan of study. Senior-level students were chosen for their familiarity with the program and its courses, and for being in the strongest position to consider its strengths and challenges from a student perspective. As consumers of the academic "product," senior students would also be more aware of distinctions between projected learning outcomes and perceived learned outcomes, again from the student's perspective. As such, it was important to recruit into the exercise students who are most familiar with the program and its curriculum. The students were most likely to have higher GPAs, reflective of a high level of engagement and familiarity with the program, and also arguably represent the most accurate version of the program's "completed product." Based on this, students with a GPA of 3.5/4.0 were invited to participate in the research exercises. After being identified, students were contacted by e-mail with an invitation to participate in the research. The full purpose of the research and explanation of exercises were provided in the e-mail, as well as the projected time (1 hour) parameters for their voluntary participation.

The convenience sample of 11 senior-level students was assembled during an evening hour in which fewer courses would present a scheduling conflict. When all students had arrived at the research room, the research purpose and full consent forms were distributed and then read aloud to the group. The students were then given an additional few minutes to read through the document and ask any questions about the study or procedures, although nearly half of the students upon recognizing the directions

and consent form immediately signed the form and waited for the exercises to begin. As no questions were asked, the researcher then distributed to each participant sticky notes and pens, and then provided students with verbal instructions for the first exercise, Affinity Clustering.

The participants were initially informed there would be two exercises, but were not told what the second exercise would be until the first had concluded, so as to not affect the results of the first exercise. Students were asked to identify what learning outcomes they felt were most important from their experience with the program. Students generated these outcomes individually and without discussion in 5 minutes. As a memory aid, the students were provided with a hard copy list of the core required courses for the Game Design major as well as the instructors who taught those courses. Additionally, because the students were allotted 5 full minutes to write down all the outcomes they could think of, the following directions were projected onto a screen at the front of the room for their reference: *Please take 5 minutes to write down what you believe are the learning outcomes of the Bradley University Game Design Program? That is--what are the skill sets, proficiencies, and areas of knowledge do you feel you've been taught (to varying degrees) as you are nearing the completion of this program?*

The students were instructed to write each individual outcome on its own sticky note but to keep them at their desks until the 5-minute exercise was completed. Students were then asked to come up to the board individually with their notes and verbally identify each learning outcoming as they placed it on the whiteboard. The researcher then asked for a volunteer to be the first to place their notes on the board. The first volunteer placed her notes horizontally on the board. The second volunteer placed their

first unique idea in the same horizontal line, but then began placing outcome notes vertically to align with similar outcomes placed by the first student.

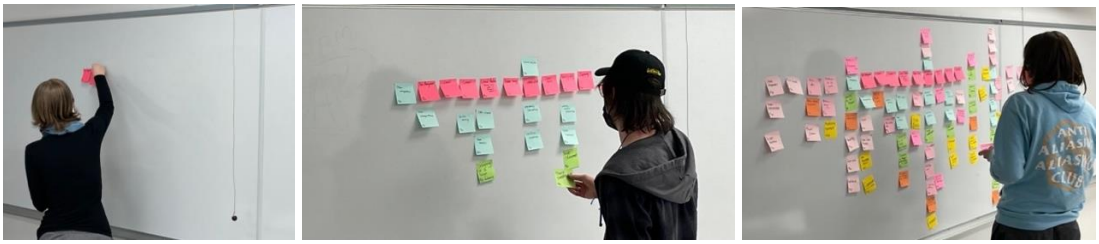


Figure 8. Senior Game Design majors participating in Affinity Clustering.

This trend continued, as subsequent students began placing their notes on the whiteboard. Topical clusters began to form organically by the placements, without direction from the research leader. The board soon began to resemble a loose Scrabble configuration.

Figure 9. The "Scrabble board" of game design program outcomes.

It is worth noting how the collective demeanor of the students changed during this part of the exercise. At first, most students were reticent to volunteer in the early

stages of placing their notes on the board. However, after the third participant had done so, the students became more actively engaged in the activity and appeared eager to share their perspectives. This could be due to a sense of agency conferred by someone actively soliciting their opinions, with the knowledge such opinions would be recorded and reported anonymously. Their enthusiasm for sharing their opinions seemed to compound as the Affinity Clustering exercise progressed, perhaps as an affirmation of their shared experience in the game design program. Before this stage of the exercise concluded, the researcher had to request students go one at a time to the board. One participant asked if they could continue to write additional outcomes as they came to mind. The researcher responded they would be permitted to do so after all of the students had placed their initial outcome notes on the board. In the second "round" of notes, approximately half of the students had additional notes and outcomes, inspired by the first wave of posted notes and group commentary.

After each participant had placed their notes on the board, they were then asked to (as a collaborative body) spend the next 5 minutes arranging the items into clusters of replicated or similar outcomes. Items were then verbally discussed and arranged (and rearranged) into groups and subgroups. After each individual item had found its "home," the researcher then asked the group for assistance in naming each cluster. The cluster titles were then written with dry erase marker above each grouping. Where a smaller outcome grouping was related to a larger outcome, arrows were drawn between the two groups to reflect the closer association. During this part of Affinity Clustering, the students were permitted to act together in determining the clusters, and all did so very enthusiastically, as though assembling a puzzle in which all pieces had the inherent

ability to fit together, and there was no “wrong” answer to the image that would materialize from the finished clusters. A collective “buzz” of activity marked this part of the research, as students searched for the emerging “homes” for their notes and seemed to feel a sense of accomplishment when an idea found its place among similar ones.

Figure 10. Developing categories of curricular outcomes.

After the groupings had been set and the Affinity Clustering exercise concluded, students were then instructed to begin the Visualize the Vote exercise. Each participant was given three gold-colored sticky notes to be used as “votes” and placed on each group or subgroup item according to its importance to the participant. Two of the sticky note ballots would feature a large dot; these votes would be applied to a specific skill set or proficiency outcome of the program the student believed was the most important according to their experience with the game design program. The third sticky note (unmarked) would serve as a vote for the most important overall cluster/category. This step was designed to illuminate which learning outcomes from the game design curriculum are considered most relevant among student stakeholders.

Figure 11. Game Design students Visualizing the Vote.

As with the structuring of the Affinity Clusters, the voting part of the exercise generated a great deal of energy and enthusiasm, but also significantly more consideration before the votes were cast. Whereas the ideation and clustering exercise were restricted only by time, the Visualize the Vote exercise hinged on the allocation of the very finite resource of their three votes. Students were also permitted to place their votes concurrently with others, returning students to an introspective, individual mindset, different from the collective effort in forming and naming the clusters. This part of the process was valuable in that one student's votes did not seem to influence the votes of others, or be influenced by the votes of others. This result created a dynamic tapestry (both figurative and literal) reflecting the aggregate of the group's perceptions as well as illuminating each individual's experience in the program.

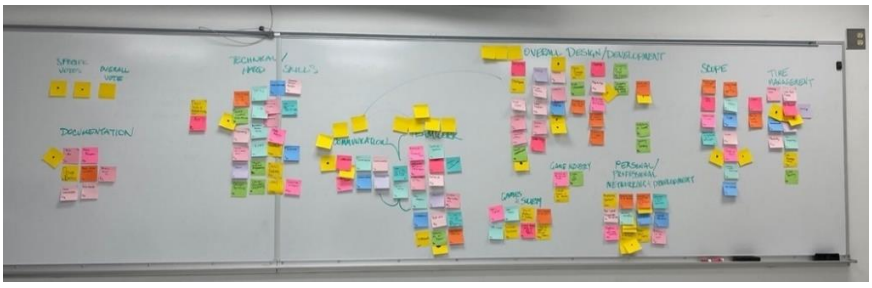


Figure 12. Completed Affinity Clusters and Visualize the Vote results.

Figure 13. Interactive video game designed by Bradley University students.

Phase II Procedures: Game Creators

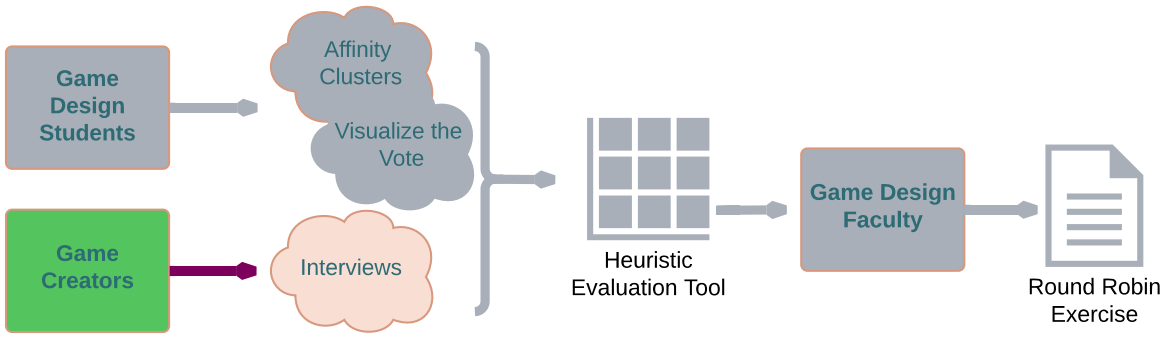


Figure 14. Phase II in research procedures.

A qualitative, inductive approach allows the researcher to collect specific perspectives and opinions among stakeholders, which may then be analyzed to discover emerging trends, categories, and interrelationships (Patton, 2008). In the second phase of research, interviews were conducted with a purposive sample of 17 professional game

creators currently working in the industry (Fraenkel et al., 2012). With participant consent, video chat sessions were recorded, allowing the researcher to focus on the conversation and interviewing process. Participants were informed in advance that the recorded media files would be used solely for accuracy and would not be published or shared.

Game designers were identified for interview participation through personal network contacts, university alumni, and by industry affiliation/position description on the networking business platform LinkedIn. Participants were recruited by e-mail invitation explaining the research project, the research questions, and how their participation would be used in the project. Once a contacted designer had accepted the invitation to participate, a Zoom video call was scheduled at a time convenient for both the participant and researcher.

Saban (2016) developed a questionnaire for academic administrators to conceptualize curricular decision-making processes for design programs. This second phase of research attempted to gauge the value of students produced by such programs. The objective of the interviews was to determine what skill sets and knowledge are most valued by those immersed in the business of game design and if those skills are perceived to be held by graduates of academic game design programs. Gathering information from a variety of game designers articulated perceptions of knowledge and skillset gaps seen in younger, newly graduated designers. Questions focused on recent and emerging trends in the game design industry and solicited opinions as to how well recent game design graduates were prepared to enter the field and meet the needs of their organizations. Additional questions polled information about the designer’s professional

and academic backgrounds, the type of design organization they work for, and their depth and breadth of experience in the industry. This provided a more useful lens through which to consider the effectiveness of game design programs in higher education.

The interviews consisted of open- and closed-ended questions to understand what game design organizations most value in college graduates seeking employment in the industry and ranged in duration from 20-45 minutes (Appendix A). Using the Zoom video platform for interviews allowed the research to draw a sample from a larger geographically diverse population, as well as communicate more effectively through video than an audio-only channel.

The scripted questionnaire was divided into three subparts: trends and necessary skill sets, business trends in the industry, and lastly demographic questions about the interviewer's academic background and professional career.

The first section attempted to direct the respondent to consider the current state of a rapidly developing industry: "Could you comment on what you perceive to be the major trends in the game design industry over the past 3-5 years?" Having the respondent now thinking of the present-day, dynamic industry environment would better focus their answer to the next question: "What knowledge or skill sets do you think are most necessary for recent graduates hoping to find work in the industry?" Additional questions in this section attempted to gather opinions on what skill sets the respondent believed *were* and *were not* being taught well in game design programs.

A verbal prompt introducing the second subpart redirected to the current trends in the business of the game design industry. Questions were re-framed to consider the

importance of understanding of the economics of the industry: “Could you comment on what you perceive to be the major business trends in the game design industry, relating to revenue generation and profit?”

The demographic section gathered information about the participant’s academic background: where they went to college and what they studied. Additional questions centered on how long they had worked in the industry, job titles, involvement in business and hiring decisions, and specialized areas of design.

A final question, “Is there anything else you would like to share regarding the value of academic game design programs?” provided the participant to freely share any additional opinions relevant to the research topic.

The interviews were conducted over a period of 3 weeks. The respondents covered a diverse field of positions and experience in the game design industry, from Quality Assurance technicians who are 6 months into their first position, to Senior Creative Recruiters with over 30 years of experience. While the perspectives were varied, consistent opinions regarding important such as soft and technical skills, networking, and creative production began to emerge.

After each interview, the researcher replayed the saved media file to check notes for accuracy and inclusion. Once all interviews had been checked for accuracy, the responses were then compiled according to each question. From this process emerged a number of consistent themes or data points that were then used to construct a Heuristic Evaluation Tool. This tool served as an elemental checklist of topics used in evaluating an undergraduate game design curriculum.

Game Design Program Curriculum Heuristic Evaluation

Heuristic	Student Perceptions of Heuristic Present within the Curriculum	Comments
1. Students learn critical soft skills: communication, self-presentation, negotiation skills.		
2. Students learn to work in a variety of roles within a team.		
3. Students produce their own games		
4. Students can create and develop skills and ideas within a game design club.		
5. Helping students explore various job descriptions and find their "niche" in the game design industry		
6. Students acquire a variety of skills to make them more adaptable and flexible in their first position.		
7. Students learn critical thinking skills to provide and receive usable feedback on game projects.		
8. Keeping up with evolving technical trends: engines, platforms, end user-control and content creation		
9. Keeping up with evolving business trends in revenue generation and profit		
10. Students supplement their game design curriculum with courses in psychology, creative writing, art, cinematogrophy, accounting, narrative storytelling, etc.		

Figure 15. Heuristics generated from industry interviews.

The Heuristics were then compared to the perceptions of the senior game design students to determine if those elements were fully present, partially present, or

minimally/not present in the game design curriculum. This Heuristic tool was then taken into the next phase to inform game design faculty as they consider their own program's desired learning outcomes (Appendix D).

Phase III Procedures: Game Design Faculty

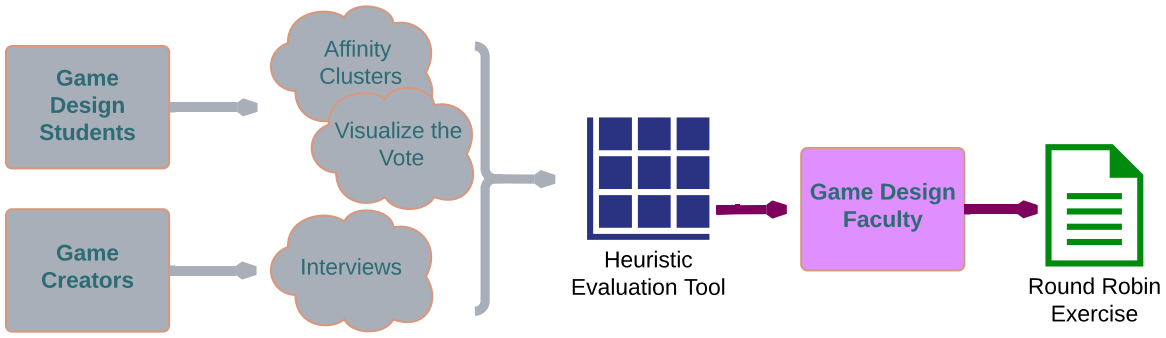


Figure 16. Phase III in research procedures.

In the third and final phase of this research, findings of the first two research phases were presented to the five game design instructors for further examination and response. Participants in this phase were drawn from a convenience sample of faculty in the Interactive Media Department at Bradley University. The game design program at

Bradley University was ranked among the top 10 in the world by The Princeton Review in 2019 (The Princeton Review, 2020). The Interactive Media Department currently has five full-time game design instructors, all of whom have expressed interest in this type of study. The conference room space necessary to conduct this research was made available by the Interactive Media Department. The room (pictured below) is large enough to comfortably accommodate the instructors and conduct the Round Robin exercise.

The assembled faculty, after further discussing the results of the Heuristic Evaluation Tool (HEV), were then guided through a Round Robin exercise in which a nominal number of "challenges" to the program were presented. The Round Robin technique is designed to encourage non-traditional ideation in a collaborative and freethinking environment (LUMA Institute, 2012). In the Round Robin, each participant was given a worksheet with one of the program challenges included in this statement: "How might we solve _____?" Participants were then instructed to write one unconventional solution, including as much detail as possible, and to then pass the paper to their left. In the next step, the participants read through the initial idea and write a detailed reason why the proposed solution will fail. The worksheets were then passed once again to the left, and a new concept was proposed to solve for the initial idea's critique. For each step, participants were given 3 minutes. After three iterations of proposal/critique/solution, potentially viable solutions emerged that the faculty then further discussed and even ranked by collective agreement.

The faculty members were all very engaged with the Round Robin process, and their collegial attitudes further enhanced the creativity needed for a fruitful exercise. The three heuristic categories (keeping pace with business trends, keeping pace with

technological trends, and creating purposeful supplemental minors for game design students) were acknowledged to be valuable areas of inquiry for improving the curriculum for graduate success. The entire process concluded after one hour.

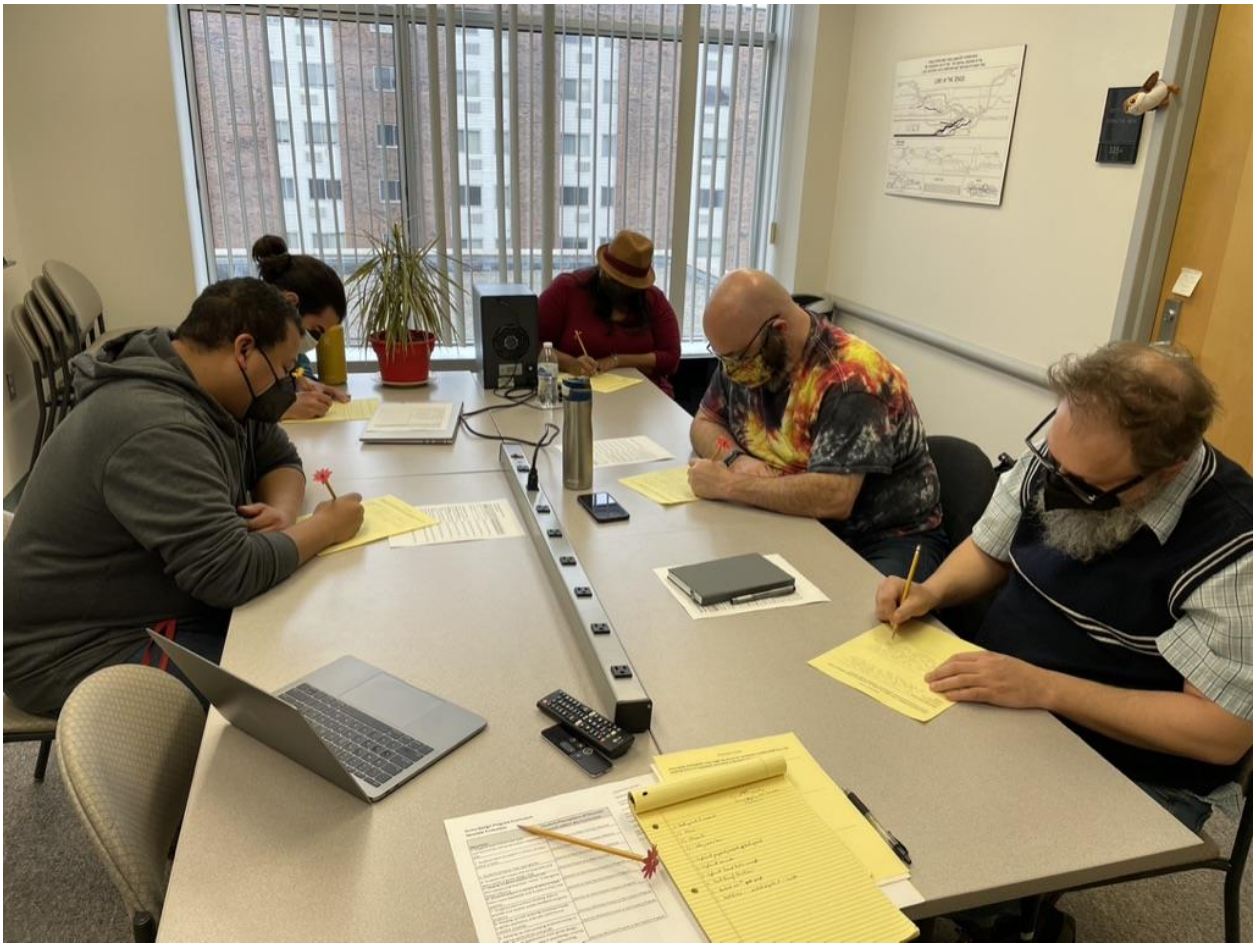


Figure 17. Game Design Faculty participate in Round Robin exercise.

The final output from this research were two concept posters: the first summarized the findings of each research phase, incorporating visually the perspectives of each group of stakeholders regarding the strengths, challenges, and proposed solutions to keeping a game design program in step with the changing demands of the game design industry. The second poster presented a profile of the "ideal game design program graduate," according to the research findings. Key considerations and recommendations

were packaged as a “pitch” for the best practices a game design program may adopt to remain a competitive brand among its student recruitment targets as well as maintain a positive reputation for organizations hiring their graduates into the industry. These posters were part of a presentation given to the chair of the Bradley University Interactive Media Department upon completion of the research and successful thesis defense.

Research Limitations

Affinity Clustering can be a very fruitful method for drawing qualitative insights from a larger group. However, it is also dependent upon students’ ability to summon through unaided recall the most relevant aspects of the program they have been entrenched in for the previous 3 years. Group discussion and sharing of observations may mitigate this potential liability to a degree, although ideas and memories triggered by the responses of other participants may still not capture the totality of a program. For the purpose of garnering the most relevant top-of-mind learning objectives, this “limitation” may provide insights by what is not reported during the exercise.

Another potential limitation to Affinity Clustering and Visualize the Vote exercises is the time constraints placed on the participants. By requiring both exercises to be completed within one hour, students had to articulate their responses and votes in a very short time period, limiting their ability to more deeply consider and articulate the major curricular outcomes of the program.

Additionally, evaluations of the heuristics’ presence in the program were determined solely through the research conducted with the game design students. Separate interviews with faculty regarding the most important learning outcomes of the

program and a curricular course review would provide a validity check on the students' perceptions, as well as creating an additional layer of data to the study.

For the Interviews phase of the research, a number of research limitations should be considered. A smaller sample size—while more manageable—restricts the ability of the researcher to generalize the findings beyond the limited scope of the inquiry. The questions within the interviews may also affect the validity of the findings due to the lack of experience and expertise in game design of the researcher. A variety of subjects may also provide inconsistent responses relative to the participants' experience and work within the industry. Additionally, having only one researcher analyze and code the response data into heuristic categories could produce biased interpretation. Having at least one additional researcher to independently review the data would increase the reliability of the research results.

Heuristics generated from the first two phases of the research are also limited in their generalizability beyond this moment in time, dependent on the perceptions of game design students midway through their final year in the program, and what interview respondents report at this time to be the most important knowledge and skill sets valuable to organizations in the game design industry. The corresponding categorization as to what degree the heuristic has been met are the researcher's interpretation of the students' responses.

Round Robin exercises may be subject to group dynamics, which may negatively influence idea generation. By its design, the strategy is not anonymous, so participants may be inhibited from a fully open critique of an idea or proposed solution concept because of existing interpersonal relationships. Participants also bring to the exercise

personal histories with (in this case) the game design program, and so ideas and critiques may be tempered by past work on the curriculum.

Finally, the research techniques were chosen to illustrate and address the curricular challenges unique to the game design program at Bradley University. Utilizing a convenience sample of Bradley game design students and faculty prohibits the generalizability of the specific findings to other university game design programs.

Results

To answer the research question "How might we use Design-Thinking strategies to develop and maintain a rigorous academic game design curriculum that serves the interests of key stakeholders in a creative and ever-changing industry?" required a multi-stage methodology of data collection from the three groups of stakeholders. The first two stages (game design students and game industry professionals) were collected independently, and then the data sets from each were compared to create the Heuristic Tool that became the catalyst for the third stage of data collection utilizing the Round Robin technique.

Phase I Results: Game Design Students

The first phase of data collection from the Affinity Cluster technique generated nearly 100 individual learning outcomes, from which emerged a useful taxonomy of cluster categories, listed below.

Communication and Teamwork: Communication within teams, with clients, game critiques and feedback, conflict resolution, and collaboration

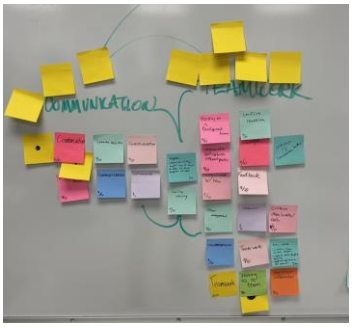


Figure 18. Communication and Teamwork Cluster

Personal/Professional Networking and Development: Marketing themselves, networking, managing expectations for the industry, understanding their own strengths and limitations, and preparing résumés

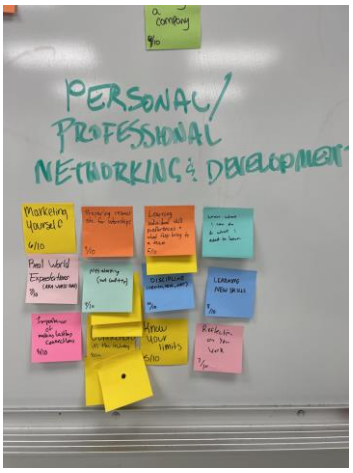


Figure 19. Personal/Professional Networking and Development

Overall Design and Development: Prototyping, iteration, player choice, state diagrams, playtesting, design sketches, designing games with the end user in mind, responding to dynamic workflow changes, UX research and playtest feedback, and the game development process

Project Scope and Time Management: Balancing players versus client needs and expectations, managing client work, goal setting, handling crunch, time management, work delegation, issue tracking, flexibility, and overworking

Technical (Hard) Skills: Unity, coding and scripting, programmatic problem solving, source control Github, Adobe products, programming design patterns, math, C#, and programming

Games and Society: What is a game?, game analysis, social impact of games, surveillance capitalism, video versus tabletop games, art in games, art as games

Documentation: Construction design documents, basic design principles, design philosophies, rule books, game information, designing around fun

The Games Industry: Intricacies of the game industry, indies vs. AAA game companies, current events in the games industry

In terms of perceived importance, the highest general vote-getting cluster was *Communication and Teamwork*, although specific ideas under that umbrella only garnered three specific votes. *Overall Design & Development* received three general votes, but led all clusters in specific votes with six.

The developed clusters and corresponding votes provided a useful catalogue of skills and knowledge to compare and contrast with the responses of games creators gathered during the second phase of research.

Phase II Results: Game Creators

"**It's the Wild West; the *Weird* Wild West, even**." **–Game design producer, company owner, 25 years industry experience**

The next phase of research relied on ethnographic interviews with professionals working in the game design industry. Whereas the Affinity Clustering and Visualize the Votes exercises intentionally directed the student participants toward an articulation of program priorities, it would not be until after all of Phase II research was complete

before an analysis of the data would potentially yield consistent responses about university game design programs. With that in mind, the interviews were less rigidly structured than the exercises in Phase I. While each dialogue began with the same scripted explanation of the interview's purpose, it was important for the researcher to establish and maintain a rapport with each subject through casual conversation before, during, and after the interview. As the results would be of more qualitative value due to its low number of completions, the interviewer had broader latitude to consider additional questions while conducting the interviews if it was felt that richer, more insightful commentary on the state of game design graduates was available to be mined. In nearly every case, the tone at the beginning of each interview was "collegially professional," as opposed to the exercises with the students, who responded during the Phase I research more with what might be expected of the instructor/student dyad, even though the exercise was not conducted as part of a formal class. As the interview would progress, the casual nature of the conversation, nonverbal warmth (smiling, nodding) provided by the video calls produced what is believed to be more candid, authentic, and creative responses from the sample. The interviewer could also use additional probing or thought-provoking questions to draw information out of a less talkative participant. Questions could also be adapted or, if appropriate, removed if during the course of the conversation it was determined they would be either redundant or not relevant to the person's experience or position. The last question, "Is there anything else you would like to share regarding the value of academic game design programs?" was intentionally broad to allow for unanticipated ideas or opinions not captured by the scripted questions.

"**Adaptability is the biggest thing; how are game design programs preparing students for the next big thing? Are they teaching sustainable skills?" –QA Tester with 6 months industry experience**

The interviews with professionals from the game design industry generated a checklist of proficiencies and skill sets most valuable to companies, which was then compared to the experiential reports of the game design students. A significant portion of the student perspectives were validated by the interviews, particularly in the areas of communication, teamwork, and collaboration. Additionally, the creative production of games and importance of having creative incubators like game clubs, both recurring themes from the industry professionals, were confirmed as being major pieces of Bradley's game design program. Creative thinking skills, the understanding of the wide variety of roles and positions within design projects, and the ability to be flexible in fulfilling those roles were also needs articulated by the industry respondents, and reported by students as being at least partially present in the program.

Three significant areas emerged from the interviews that were not recognized by students as outcomes of the program: keeping up with evolving technical and business trends, as well as a purposeful supplementation of the game design curriculum with courses of study focusing on the psychology, creative writing, art, cinematography, accounting, and narrative storytelling.

"It's not what you think it's going to be." –Sr. Game Producer, 16 years industry experience

The reflections of the game design students represented what they believe are the most important areas of proficiency and knowledge and created a list of attributes they

might be most likely to list on their résumés upon graduation. The interviews provided a checklist of industry priorities by which to consider to what degree the "product" of a game design program meets those needs; where the graduate will be best prepared, somewhat prepared, or perhaps minimally prepared for that first job out of college. Just as those same graduates will peruse job descriptions to determine if their skill sets match the needs of the position, the interviews served to help inform a "living" job requirement document in the form of a Heuristic Evaluation Tool. From a variety of respondents, one would expect a comparably wide variety of opinions on important skill sets, yet even from this assortment emerged consistent themes focusing on technical and soft skills, creative production, critical thinking skills, and a broader knowledge of the industry.

The majority of the heuristics were generated from the first section of interview questions regarding necessary skill sets and those the respondents felt were not being given as high a priority by academic game design programs. Additional areas developed from the second section concerning an understanding of the industry from an economic perspective, as well as the final catch-all question. Similar to the clusters generated by the student participants, similar responses from five or more industry professionals were considered relevant enough to shape a stand-alone class of heuristic evaluation. Emergent categories, with the number of times noted parenthetically, focused on communication and networking (12 times), teamwork (8), game production (6), participation in game clubs (6), finding areas of specialization (5), flexibility in roles (5), critical thinking/feedback (5), understanding technical trends (5), business trends (6), and having a field of study including art, writing, economics, psychology, storytelling, etc. (7). From this allotment of skill sets was finalized as a Heuristic Evaluation Tool, and

when combined with the Affinity Cluster results from the game design students, was then utilized in the third phase of research with the Bradley University game design faculty (Appendix C).

What knowledge or skill sets do you think are most necessary for recent graduates hoping to find work in the industry?	*They should know what part they are most interested in—art, narrative, engineering, coding, etc. A sense of what the business is like as well. Knowing what kinds of games are out there, and how the business of those games is changing. Understand all of the entertainment industry—watch, tv, film, play games; Be immersed in that space. Play more games, and explore. Being able to evaluate new games, new content. Understanding all the roles in a team. Be more hands-on. Have a writing sample.* –Creative Executive, 4 years industry experience *Networking. And having something you're interested in and good at outside of game design. Have some background in business, accounting, economic intelligence, the humanities, cultural/race/societal issues.* --Freelance Game Writer/Designer, 7 years industry experience *Core design skills. Teamwork. Soft skills. Leadership, communication. Being able to write technical specs.* –Systems Designer, 22 years industry experience
How important is an understanding of the business of game design to graduates hoping to work in the industry?	*Critical. The budget impacts use of certain tools.*—Sr. Dir. of Recruiting, 32 years industry experience *Absolutely critical. Understanding the AAA space and games as commercial art. Organizational business models.* – Games Design Manager, 15 years industry experience *We need economic designers—how to price different aspects, what are the KPIs we are balancing.* –Systems Designer, 22 years industry experience *Important—at least for perspective, to provide clarity for decisions being made.* --Sr. Designer, 18 years industry experience

Is there anything else you would like to share regarding the value of academic game design programs as they relate to the needs of the game design industry?	*It's a very competitive field. You need to look at the companies you'll apply to. Get internships—game companies really value professional experience. Figure out what you want to do—learn what that discipline is doing (level designer, narrative designer, systems designer, etc.) so you're prepared to step into the role.* –Assoc. Systems Designer, 5 years industry experience *We need stronger relationships with game professionals, Advisory committees. Get that creative spark.* –Sr. Director of Recruiting for Creative, 32 years industry experience

Figure 20. Sample of interview questions and responses

Phase III Results: Game Design Faculty

"It was an exciting moment when people read and reacted to my idea." – Professor of Game Design, Bradley University

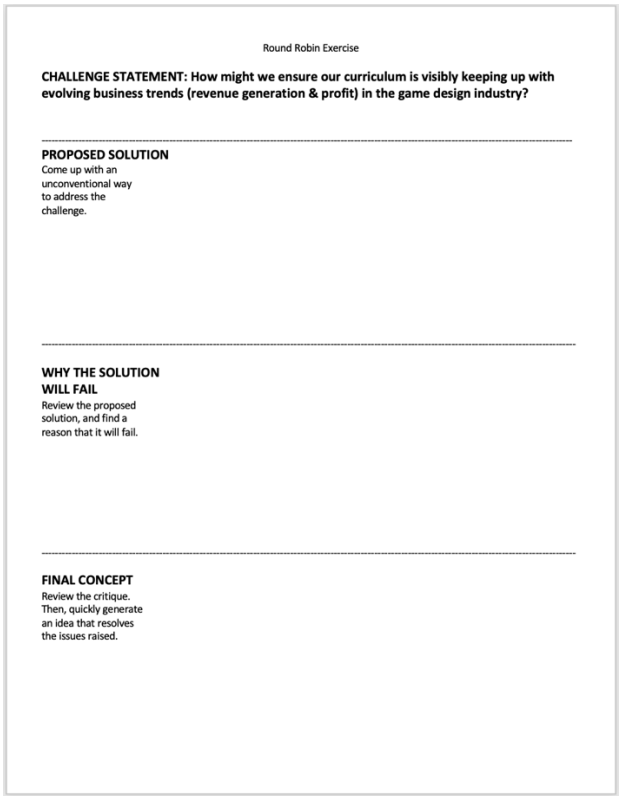
The five Bradley University game design faculty members had all immediately accepted the invitation to participate in the third phase of research and approached the session with great interest. They were very interested in the results of the first two phases, and the initial briefing and introduction to the Heuristic Evaluation Tool generated additional enthusiasm. Presenting the heuristics as a checklist of industry "needs" against the perceptions of game design students brought responses of welcomed affirmation where the heuristics were met, mixed with a resigned acceptance of the three elements (tech trends, business trends, and an expanded curriculum). This was positive for the research to this point, as the data points on the heuristic were generally confirmed. This also indicated the problem of the three violated heuristics was not an unfamiliar challenge to the program, further articulating the need for innovative approaches to the long-standing issue. The three elements identified in the Heuristic

Evaluation Tool as being minimally present or not present in the program (according to the students' perspectives) were then considered in the Round Robin exercises. Each issue served as a standalone "How Might We" topic for analysis among the five faculty members, as incorporated into the following Challenge Statements:

1. How might we ensure our curriculum is visibly keeping up with evolving technical innovations and trends in the game design industry?

2. How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

3. How might we ensure our students purposefully supplement their game design curriculum with courses/minors in psychology, creative writing, art, cinematography, accounting, narrative storytelling, etc.?



Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

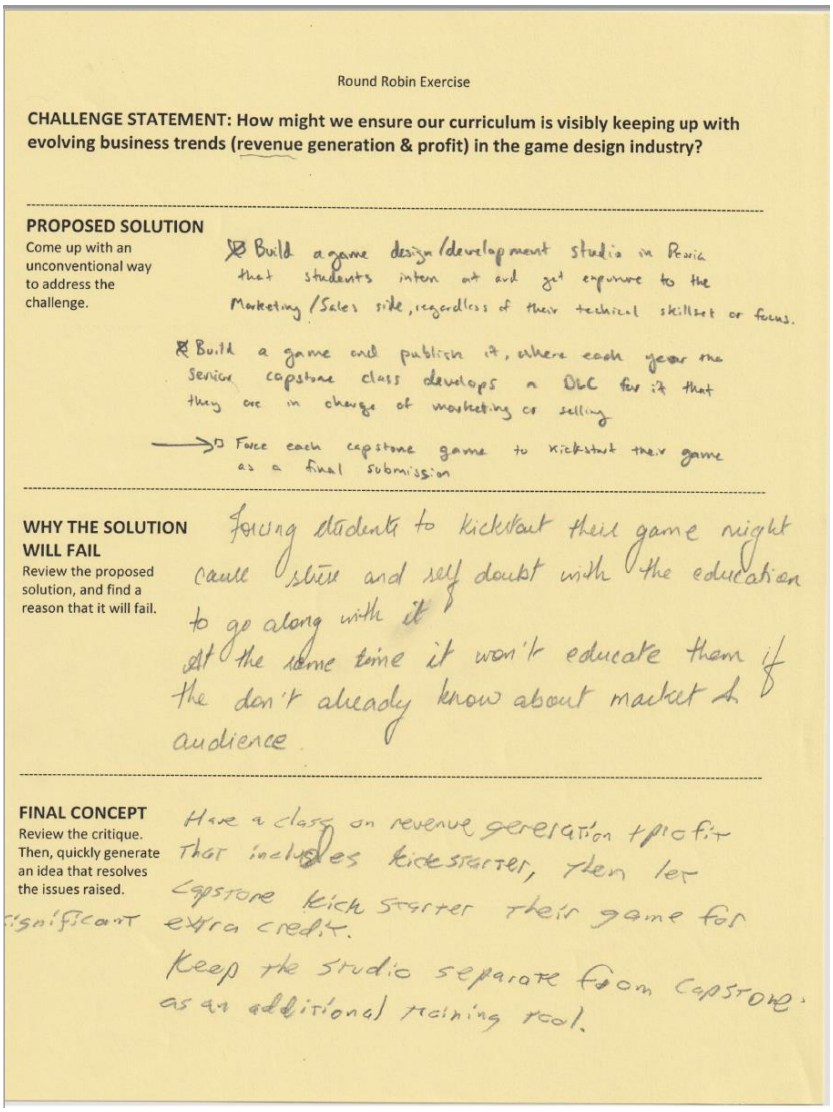
FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

Figure 21. Round Robin template.

By providing a forum to ideate without restrictions and then refine those ideas without rejection created an energetic and positive atmosphere for the faculty participants. Faculty members reported in post-exercise discussion the thrill of having one's concept reacted to, or considered the best by group consensus. The empowerment of having an equal voice in the deliberation of larger challenges further fueled the creative engine.

The Round Robin exercises were conducted according to pre-set time constraints of 3 minutes per "round." This constraint proved challenging to the enthusiasm generated by the ideation technique. While the instructions precluded discussion or collaboration

during the exercise, ideas, critiques, and solutions were still read with joyfully positive verbal and physical responses and good humor, in a figurative and literal chain reaction.



Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

- ~~Build~~ a game design/development studio in Peoria that students intern at and get exposure to the Marketing/Sales side, regardless of their technical skillset or focus.
- Build a game and publish it, where each year the senior capstone class develops a DLC for it that they are in charge of marketing or selling
- Force each capstone game to kickstart their game as a final submission

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

Forcing students to kickstart their game might cause stress and self doubt with the education to go along with it
At the same time it won't educate them if the don't already know about market & audience

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

Have a class on revenue generation & profit that includes kickstarter, then let Capstone kick starter their game for significant extra credit.
Keep the studio separate from Capstone, as an additional training tool.

Figure 22. Completed Round Robin exercise.

The initial research proposal included one concept poster that would visually illustrate the areas of agreement or divergence between the perspectives and opinions held by the three stakeholder groups (Appendix E). It became apparent, however, that the research could yield a second poster of value to visualize the *end result* of using Design-Thinking strategies to identify and adapt curriculums to the changing market needs of the

game design industry: the ideal game design graduate (Appendix F). This profile may serve as a standard for the faculty and administrators to reference when considering their program's development, as well as serving as a recruiting tool for prospective program participants, to visualize the graduate and—most importantly—successful job applicant, and where they should be at the culmination of their training.

Figure 23. Concept posters for stakeholder interests, program heuristics, and the ideal graduate.

Discussion

"This is not a solved field." –Software architect, 18 years industry experience

This research was formed by a number of points that emerged from the literature review relevant to the key stakeholders of game design students, industry professionals, and game design faculty. These considerations related to the areas of knowledge and

skill sets historically found to be most important to game industry organizations, the incorporation of students in accessing the cogent elements of university game design curriculums, and the best practices for game programs to respond to the changing needs of the industry.

For academic game design programs to keep pace with the innovations and commensurate requirements of the game design industry necessitates a vigilant surveillance of the industry, as well as ongoing evaluations of those programs. The pedagogical appraisals should also include assessments of the experiences and perceptions of the students in those programs. As noted in the review of literature, little research has focused on incorporating all three sets of stakeholders to narrow the knowledge and skills gap between industry needs and academic production.

A Design-Thinking approach allowed for a creative response to this challenge; a mix of participatory, evaluative, and idea-generating research techniques has the advantages of engaging with multiple and diverse sets of stakeholders.

How might we use Design-Thinking strategies to develop and maintain a rigorous academic game design curriculum that serves the interests of key stakeholders in a creative and ever-changing industry?

Phase I Discussion: Game Design Students

This research attempted in part to address the scarcity of utilizing student perspectives in assessing the curricular elements of a game design program. In this case, data gathered from the student sample was used as a check against the heuristics generated by the industry interviews. Student reports independent of influence by the other sets of stakeholders were useful tests to determine the degree of heuristic present in

the program, per their experience. The three heuristics indicated by the students as not met were also confirmed by the game design faculty as being not present in the program. This agreement could argue for student perspectives being considered a valid and valued tool for reflecting the timeliness and relevancy of a curriculum.

The areas of agreement can also be validating for the program, as in this case. The desired skill set most often mentioned in the industry interviews—communication—was also the cluster independently generated and considered most important by the student group. It is interesting to note the term *communication* is often considered a "soft skill," and not usually taught as a standalone course or quantifiable learning outcome. It also points to communication as a skill set not dynamically linked to the next technological or business trend, and therefore to be perennially considered a critical and consistent curricular learning outcome.

Affinity Clustering and Visualize the Vote were both engaging and rich data-gathering strategies to assess the perspectives of game design majors about to leave their programs and enter the industry work force. The introspective but also collaborative nature of the techniques produced relevant insights that affirmed several of the Bradley University game design learning outcomes, as well as illuminating some of those knowledge and skills gaps when held up to the data derived from industry interviews.

For a group of students trained to think creatively, the Affinity Clustering exercise was a very effective catalyst for understanding what they believe are the most important tools and proficiencies valuable to the game industry. The open and enthusiastic response of the students would also suggest consideration of additional or alternative Design-Thinking techniques. In the place of Visualize the Vote, Buy a

Feature could be a viable exercise to elicit from students the perceived importance of the learned outcomes of a program generated by the Affinity Clusters. Buy a Feature is a Design-Thinking strategy in which participants have a finite budget with which to buy the features of a product or service, in this case, the game design curriculum. This could potentially result in a broader spectrum of valued program attributes (LUMA Institute, 2012).

Phase II Discussion: Game Creators

The interview findings were consistent with the literature in confirming the most desired skills for new hires into the industry to include commercial knowledge, leadership and collaboration skills, and business domain knowledge (Benamati, 2010). As previously discussed, the emphasis on soft skills and business knowledge outside of game design courses have remained sought after by game organizations. As the student group's perspectives were validated by the Round Robin exercise and discussion with the faculty, in the same manner the faculty were in agreement with the importance of each heuristic generated by the interviews.

Given the difficulty of assembling a geographically and demographically diverse set of stakeholders as game design professionals, interviews were a manageable and productive method for drawing out the desired qualities in a new hire into a game design company. That the interview topic—how well are programs providing what you need?—is central to the ongoing success of an organization motivated participants to freely share their opinions. Those varied perspectives were then transferred to a heuristic that could be held up to the reflections of the students. The questions from the interviews could be used to create a more quantifiable survey, which could be distributed to a larger body of industry professionals, generating more results with greater validity. A higher response yield would then allow a researcher to drill deeper into

the unique requirements by specialty; how are the requirements for a game level producer different from those of a game designer? A larger response pool would also allow the researcher to investigate differences in perspectives based on a professional's academic background. Those interviewed for this research who had more than 10 years' experience in the industry were significantly more likely to not have a degree from a formal game design program. Respondents who came out of an academic game design program may have a confirmation bias to report important skill sets and proficiencies based on their own academic training. Additionally, the interviews could be used to create a kind of forward-looking Persona Profile, in which the "ideal" job candidate for each kind of role is created, and held against the reported student experiences.

Phase III Discussion: Game Design Faculty

The literature established the importance of industry input in maintaining relevant academic game design programs (McGill, 2012). However, such relationships between business and the academy are more likely the result of a business need, and therefore not designed to benefit an academic program, nor be sustainable. For universities to establish and maintain interactive relationships with game design companies may be complicated by any number of logistical barriers, including geographic availability of resources. The Affinity Clustering and Visualize the Vote student exercises and interviews with industry professionals generated a heuristic evaluation tool that delivered to the game design faculty the necessary elements to overcome those challenges.

The Round Robin exercise showed a great deal of promise, with some suggested adjustments. The assembled faculty members were all, by nature, creative and artistic individuals who would well understand how to work with the Round Robin exercise.

However, even professionals could use a warm-up. An unrelated topical practice round would address the problem articulated by one participant, post-exercise: “I know we were supposed to come up with unconventional ideas, but looking back I wish I could have been more unconventional.”

The faculty reported wanting additional time to consider critiques and final concepts. It was suggested that the first proposed solution remain at a 3-minute time limit, but subsequent steps be expanded to 5 minutes each to allow time to reflect and understand the previous idea/critique. Additionally, the researcher would add one more additional set of critiques and concept/solutions for a group of five participants. This would ensure an even deeper consideration of each challenge with all members of the group involved in each developing thread.

For all of these critiques of the exercise itself, the concept solutions generated in less than one hour generated several potentially viable ways to strengthen the game design program. As a strategy requiring very little preparation time, the Round Robin research technique can be a valuable and flexible tool for articulating future program offerings.

Conclusion

Nearly every field evolves in knowledge and practices, but the technological advancements and the industry-changing market forces they precipitate occur not at a steady linear pace, but at an exponentially faster one. A considered Design-Thinking approach can leverage a variety of equally flexible data-gathering techniques to better understand the multi-dimensional needs of multiple stakeholders. A successful game design program must be nimble enough to recognize and respond to the changing trends

to produce graduates meeting the needs of the ever-expanding but increasingly competitive market, and to remain relevant to prospective students. Those students will also benefit from a timely academic approach that maximizes their value in an increasingly competitive market. The participation of game design professionals and their organizations pays dividends in contributing to a pool of well-trained and adaptable game design applicants. Employing Design-Thinking strategies like Affinity Clustering, Visualize the Vote, Interviews, and Round Robin exercises can engage and draw insights from those stakeholder groups at regular intervals. The resulting concept posters can serve as benchmarks for learning outcomes, as well as keeping the interests and needs of those stakeholder connections top of mind when updating academic curriculums. Where change is the one constant, the adaptive discipline of Design-Thinking can help programs see those changes coming.

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Appendix A: Game Creator Interview Script and Questions

I am conducting research designed to determine how well undergraduate game design programs are preparing their students for positions in the game design industry. The information gathered in this and other interviews will be compared to the opinions and perceptions of game design instructors and senior-level students in the Interactive Media department at Bradley University.

I'd like to begin by asking you about your opinions regarding some aspects of the game design industry.

1. Could you comment on what you perceive to be the major trends in the game design industry over the past 3-5 years?
2. What knowledge or skill sets do you think are most necessary for recent graduates hoping to find work in the industry?
3. In your experience, are there areas of knowledge or skill sets university design programs *aren't* teaching students that would help increase their value to game design companies?
4. Is there any area of the game design industry you wish you had been better prepared for when you began your career in game design?

Now I'd like to ask you a couple of questions relating to the business of the game design industry.

5. Could you comment of what you perceive to be the major business trends in the game design industry, relating to revenue generation and profit?
6. Do you see these trends continuing, or might there be new or emerging revenue trends in the near future?

7. How important is an understanding of the business of game design to graduates hoping to work in the industry?

Now I would like to ask you a few questions about your academic background and professional responsibilities.

8. How long have you worked in the game design industry?
9. Are you an independent game designer, or do you work for a larger organization?
10. What is your job title?
11. What is your niche, or specialized area of design?
12. To what degree are you responsible for the business decisions (revenue generation, profit) within your organization?
13. Are you at all involved in the hiring processes for your organization, and if so to what degree?
14. What is your academic background?
15. Finally, is there anything else you would like to share regarding the value of academic game design programs as they relate to the needs of the game design industry?

Appendix B: Heuristic Evaluation Tool

Game Design Program Curriculum Heuristic Evaluation

Heuristic	Student Perceptions of Heuristic Present within the Curriculum	Comments
1. Students learn critical soft skills: communication, self-presentation, negotiation skills.	Heuristic Present as a Major Curricular Objective	Both students and interview particpants listed heuristic as major component of the program and necessary skill set for graduates.
2. Students learn to work in a variety of roles within a team.	Heuristic Present as a Major Curricular Objective	Teamwork was reported as a major part of the curriculum and frequently mentioned as an important skill set by professionals.
3. Students produce their own games	Heuristic Present as a Major Curricular Objective	A significant portfolio requirement.
4. Students can create and develop skills and ideas within a game design club.	Heuristic Present as a Major Curricular Objective	Games clubs were mentioned as a great place for independent development and creativity. BU has several game design clubs.
5. Helping students explore various job descriptions and find their "niche" in the game design industry.	Heuristic at Least Partially Present in Program	Exposure to a variety of positions frequently cited.
6. Students acquire a variety of skills to make them more adaptable and flexible in their first position.	Heuristic at Least Partially Present in Program	The ability to be flexible was an oft-repeated strength.
7. Students learn critical thinking skills to provide and receive usable feedback on game projects.	Heuristic at Least Partially Present in Program	Critically evaluating a game's design and attributes were considered important by both students and interview respondents.

8. Keeping up with evolving technical trends: engines, platforms, end user-control and content creation	Heuristic Minimally Present or Not Found in Program	Tech trends/development was not cited by students, but given considerable weight by interview respondents.
9. Keeping up with evolving business trends in revenue generation and profit	Heuristic Minimally Present or Not Found in Program	NFTs, Pay2Play, Skins, Lootboxes, etc. were frequently mentioned in interviews, but not by students.
10. Students supplement their game design curriculum with courses in psychology, creative writing, art, cinematography, accounting, narrative storytelling, etc.	Heuristic Minimally Present or Not Found in Program	Often mentioned in interviews, but not currently an articulated part of the Bradley Game Design curriculum.

Based on the '10 Usability Heuristics for User Interface Design' by Jakob Nielsen
useit.com/papers/heuristic/heuristic_list.html

Appendix C: Round Robin Directions and Worksheets

Directions for the 3 Round Robin exercises:

Please read the challenge prompt.

Everyone will have 3 minutes to come up with an unconventional idea to address the challenge. Include as many details as possible so the idea can be easily understood.

After the 3 minutes time limit please pass your papers to the person to your right.

Please take the new sheet of paper you have been given, and read the proposed solution thoroughly. Please then take the next three minutes to write down specific detailed reasons the proposed solution idea will not work.

Remember, kind constructive feedback is a good thing.

After 3 minutes, please pass your papers again to the right.

Please read through the initial proposed solution on this sheet, the critique. Then, take another 3 minutes to refine the original idea to address the critique.

After 3 minutes are concluded, we will share and review each other's ideas.

Appendix C (continued): Round Robin Directions and Worksheets

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving technical innovations and trends in the game design industry?

PROPOSED SOLUTION

Come up with an unconventional way to address the challenge.

WHY THE SOLUTION WILL FAIL

Review the proposed solution, and find a reason that it will fail.

FINAL CONCEPT

Review the critique. Then, quickly generate an idea that resolves the issues raised.

Appendix C (continued): Round Robin Directions and Worksheets

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

PROPOSED SOLUTION

Come up with an unconventional way to address the challenge.

WHY THE SOLUTION WILL FAIL

Review the proposed solution, and find a reason that it will fail.

FINAL CONCEPT

Review the critique. Then, quickly generate an idea that resolves the issues raised.

Appendix C (continued): Round Robin Directions and Worksheets

CHALLENGE STATEMENT: How might we ensure our students purposefully supplement their game design curriculum with courses/minors in psychology, creative writing, art, cinematography, accounting, narrative storytelling, etc.?

PROPOSED SOLUTION

Come up with an unconventional way to address the challenge.

WHY THE SOLUTION WILL FAIL

Review the proposed solution, and find a reason that it will fail.

FINAL CONCEPT

Review the critique. Then, quickly generate an idea that resolves the issues raised.

Appendix D: Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving technical innovations and trends in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

General Thoughts:
- Get students certified in software skills or programs, then market the number of graduates that leave with that certification
- Attend industry events, learn from them about what the trends are, then incorporate those trends into curriculum by having guest speakers, getting faculty trained up on that topic(s), then holding symposiums with students about what was learned

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WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

getting certified in software may shift focus on specific tech skills but not tech students to be adaptable to the chang in tech innovations. Might Be alot of $ to pay for All the Cert's.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

BRADLEY CAN CREATE A PALETTE OF "MINORS" THAT ARE COMPETENCIES IN SOFTWARE PACKAGES. THEY CAN BE MARKETED AS IF THEY ARE CERTIFICATES AND ARE GAINED THROUGH EXTRA-BRADLEY PROGRAMS FREES STUDENTS UP FOR GAME DESIGN OVER PROGRAMMING.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving technical innovations and trends in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

1. Every Student in Game Des has to take a course in Rapid Prototyping. Rather than specifying something like Game type or 30/2D we instead specify platform for each prototype (4 prototypes per semester), 2 on platform X and 2 on platform Y. Then every year we purchase 1 new platform for the class maybe let them choose. From a selection of unconventional platforms

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

1. This only satisfies game design learning & won't guarantee our curriculum is up to date
2. Buying new technology can get out of control quickly.
3. No ~~relati~~ specific correlation with the industry itself we need to get them more involved.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

- Student lab fees will cover 1 devkit of a console per year.
- Get students in contact with studios that are developing on these platforms and learn how they use it or problem solve when they encounter issues with them.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving technical innovations and trends in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

Have A Semester where Students work on a project within A Studio/Company that is Mangaged By Pros in that Studio/Company. We Would Want to Make Sure that these Studio's are on the cutting edge of tech innovation.

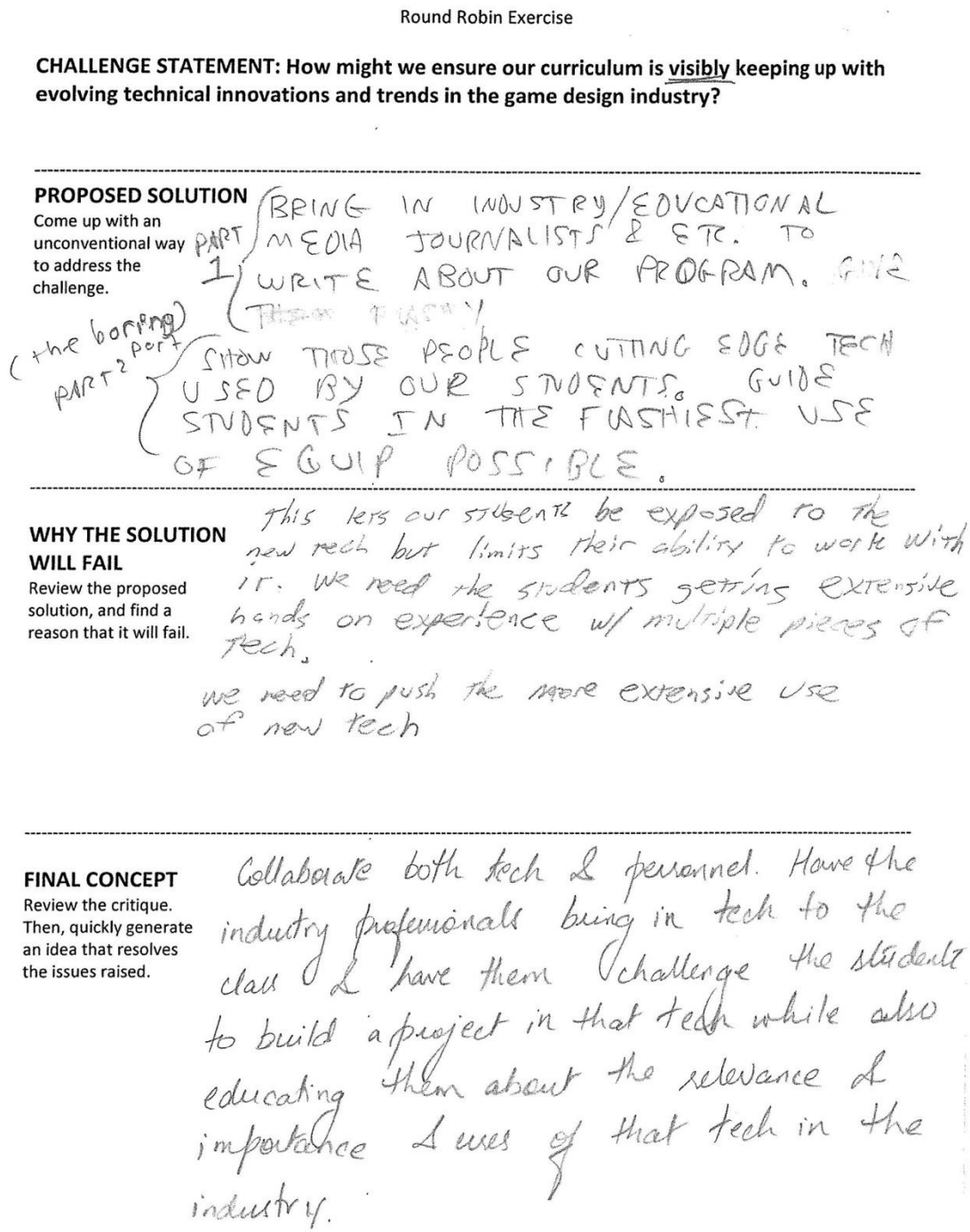
WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

It's A GLORIFIED INTERNSHIP PROGRAM AND ANY COMPANY THAT WOULD PARTICIPATE ISN't WORTH WORKING WITH. THE MORE WE PUT THAT SEMESTER TOWARD COMPANY WORK THE LESS THE STUDENTS LEARN IN ~~THAT~~ A PROPER PEDAGOGICAL SETTING.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

Instead, partner with the studios. They provide hardware and critique of work. Bradley teaches the students How to incorporate the tech into their own work.

Appendix D (continued): Completed Round Robin Forms



Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving technical innovations and trends in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

PART 1 (the boring part): BRING IN INDUSTRY/EDUCATIONAL MEDIA JOURNALISTS & ETC. TO WRITE ABOUT OUR PROGRAM. GIVE [illegible]

PART 2: SHOW THOSE PEOPLE CUTTING EDGE TECH USED BY OUR STUDENTS. GUIDE STUDENTS IN THE FLASHIEST USE OF EQUIP POSSIBLE.

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

This lets our students be exposed to the new tech but limits their ability to work with it. We need the students getting extensive hands on experience w/ multiple pieces of tech.

we need to push the more extensive use of new tech

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

Collaborate both tech & personnel. Have the industry professionals bring in tech to the class & have them challenge the students to build a project in that tech while also educating them about the relevance & importance & uses of that tech in the industry.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving technical innovations and trends in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

More transparency between academic institutions & professional institutions – actually have our curriculum reviewed by industry professionals & constantly update our curriculum.
Share our curriculum with other academic institutions learn what they do right, always keep up to date.

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

- Other academic institutions may not be willing to share their "golden" ideas that lead to success because it would make their program less unique / special.
- Industry professionals are most likely far removed from academia at this point, so their focus may be too heavy on their specific company practices.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

We could Host some kind of event that lasts A Few Days that Brings Academics & Industry Pros together. Ideas would Be shared. Both Side's Could give Presentations.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving technical innovations and trends in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

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Review the critique. Then, quickly generate an idea that resolves the issues raised.

We could Host some kind of event that lasts A Few Days that Brings Academics & Industry Pros together. Idea's would Be shared. Both Side's Could give Presentations.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

~~Build a game design/development studio in Peoria that students intern at and get exposure to the Marketing/Sales side, regardless of their technical skillset or focus.~~

~~Build a game and publish it, where each year the Senior capstone class develops a DLC for it that they are in charge of marketing or selling~~

→ Force each capstone game to kickstart their game as a final submission

---

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

forcing students to kickstart their game might cause stress and self doubt with the education to go along with it

at the same time it won't educate them if the don't already know about market & audience.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

Have a class on revenue generation & profit that includes kickstarter, then let capstone kick starter their game for significant extra credit.

Keep the studio separate from capstone, as an additional training tool.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

Collaboiate with the business college & have them share market research on the games industry. Also when creating games, involve the actual marketing & revenue points in the project with the game design process.

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

Unfortunately I recently learned that the Business College knows nothing about trends in the Game Industry. Right now we're setting up 2 internships for partnership w/ the Business College to help rectify this

---

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

WE FIND A BETTER BUSNESS COLLEGE OUTSIDE OF BRADLEY. ONE ~~RIGHT~~ ON A COAST WITH A FACULTY ALREADY TIED IN WITH THE INDUSTRY.

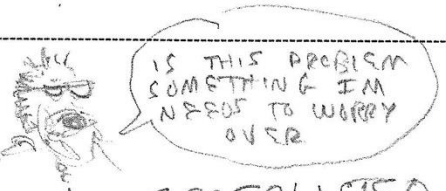
PARTNER WITH THEM.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.



CREATE A CROSSLISTED CLASS WITH THE ENTREPRENEURSHIP SCHOOL, THAT CLASS CORRELATES INDUSTRY DATA AND PRESENTS TO I.M. (CREATE A GAME) ~~(AN EASY~~ MINOR ~~BUSINESS)~~

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

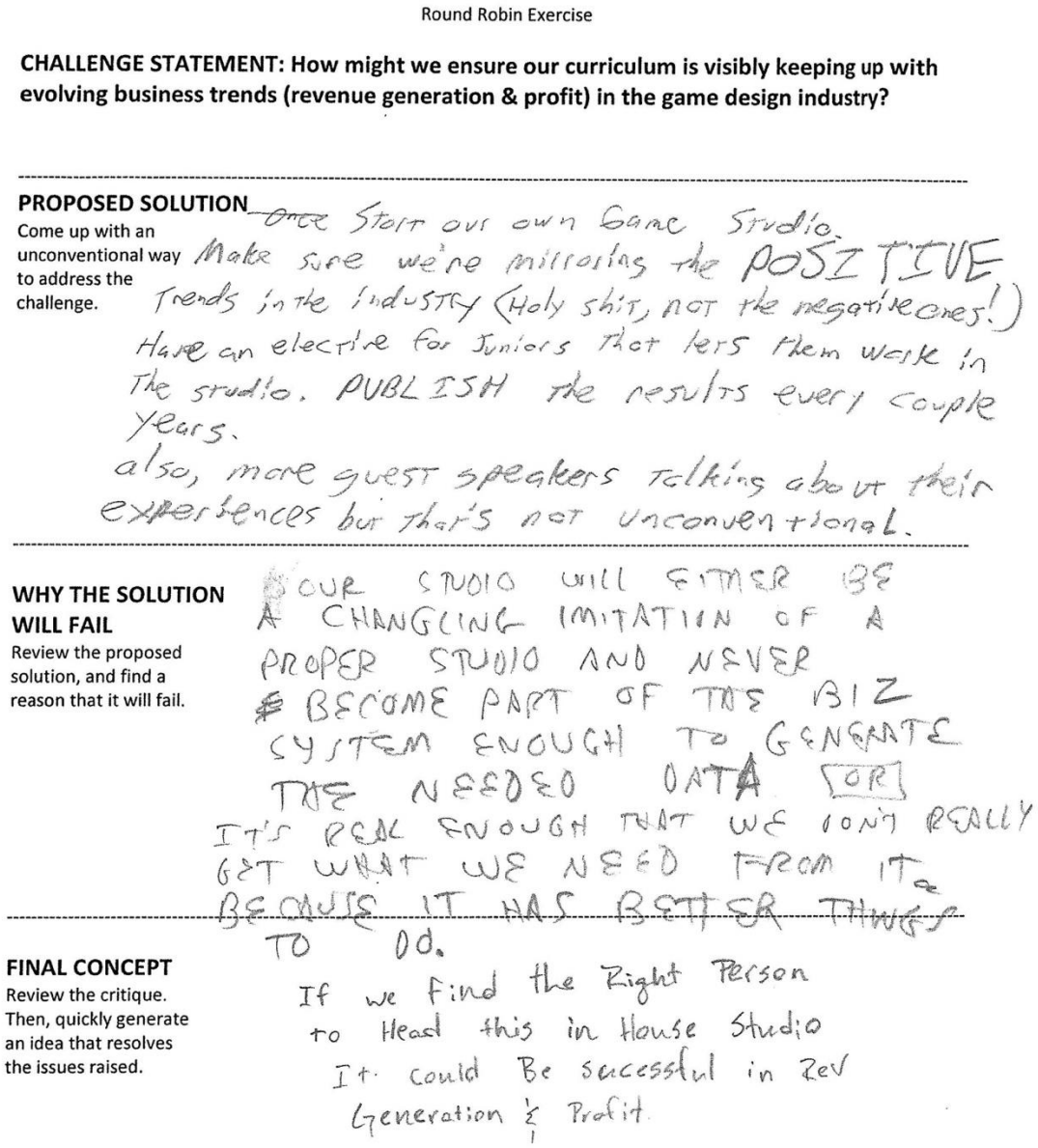
Most students may fail to see this Minor's Relevance.

- Getting Business on Board could prove challenging whats in it for them?

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

- ☐ Focus on Esports (streaming) initially since students can relate to how that operates. Use that as an introduction to running a successful esports team or streaming studio

Appendix D (continued): Completed Round Robin Forms



Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

~~Once~~ Start our own Game Studio.
Make sure we're mirroring the POSITIVE Trends in the industry (Holy shit, not the negative ones!)
Have an elective for Juniors that lets them work in the studio. PUBLISH the results every couple years.
also, more guest speakers talking about their experiences but that's not unconventional.

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

OUR STUDIO WILL EITHER BE A CHANGLING IMITATION OF A PROPER STUDIO AND NEVER BECOME PART OF THE BIZ SYSTEM ENOUGH TO GENERATE THE NEEDED DATA [OR] IT'S REAL ENOUGH THAT WE DON'T REALLY GET WHAT WE NEED FROM IT, BECAUSE IT HAS BETTER THINGS TO DO.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

If we find the Right Person to Head this in House Studio It could Be successful in Rev Generation & Profit.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our curriculum is visibly keeping up with evolving business trends (revenue generation & profit) in the game design industry?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

Have A Shark tank Type of thing where A Panal says if they would invest in Stundents games. would Be Cool If there was actual Money in play For the Panal to actually invest in ideas they feel would be profitable.

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

- Students in this department typically aren't building games that have a long shelf life or marketability factor, so the Shark Tank may never actually find a game that they feel comfortable investing in since they don't feel they'd get a return on investment.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

Educate students on marketability & long shelf life of games. Create a challenge where they create a game with this in mind and show their work on revenue & profit. Pitch their game to their peers (panel) as a complete product (game + marketing).

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our students purposefully supplement their game design curriculum with courses/minors in psychology, creative writing, art, cinematagraphy, accounting, narrative storytelling, etc.?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

WE ~~[illegible]~~ HAVE STUDENTS MAKE GAMES THAT POSE EXISTENTIAL QUESTIONS ABOUT MAKING WHICH DRIVES THEM INTO THE LIBERAL ARTS TO SEEK ANSWERS WHICH, IN TURN, HELPS THE STUDENTT MAKE BETTER GAMES.

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

most students will just assume they have the answers and go with whatever minor they want.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

Collaborate with other departments & learn details of their courses & then incorporate it into the design challenge for the students, make the students aware that they need to seek design details from other departments.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our students purposefully supplement their game design curriculum with courses/minors in psychology, creative writing, art, cinematagraphy, accounting, narrative storytelling, etc.?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

Develop courses that fit into the minors we want to incentivize and count as our own electives, thereby making those minors easier to accomplish for our own students. Talk those minors up during advising.

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

Other departments may not ~~want to~~ agree with duplicate course creation. If the courses already exist, why re-develop them in our curriculum.

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

- ☐ Have the other departments touch on or dedicate portions of their course to their actual application in game development.
- ☐ Have them guest lecture in our courses about their given area or elective

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our students purposefully supplement their game design curriculum with courses/minors in psychology, creative writing, art, cinematagraphy, accounting, narrative storytelling, etc.?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

☒ Update Advising sheets

☐ Have faculty members take some of these electives at Bradley, weigh in on their efficacy or relevance, then update our advising sheets/curriculum plan with some of these classes

☒ Have practicum guest speakers give testimonials on what classes they took in college that were unconventional, but they can attest were transformative to them

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WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

Having a Faculty member take a class May Not work with a Faculties work load

---

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

BRADLEY COMMITS TO I.M. & FOLLOWING THE LIBERAL ARTS ~~PRACT~~ FORMAT AND HIRES MORE FACULTY TO FREE PEOPLE UP FOR IMPROVING CLASSES WITHIN BRADLEY OR ELSEWHERE.
↳ INTEGRATE INTO OUR CLASSES
OR BRADLEY I.M. BECOMES LIKE ENGINEERING.

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our students purposefully supplement their game design curriculum with courses/minors in psychology, creative writing, art, cinematagraphy, accounting, narrative storytelling, etc.?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

Have A class Freshman year that gives student's a taste of each Relavent minor and Have them ~~take~~ Pick one the Next year. Get input/Participati from faculty & Student's From these Minors

---

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

THE FIRST YEAR IS ALREADY OVERWHELMING, WHAT DO WE TRADE AWAY TO MAKE ROOM FOR THIS CLASS? STUDENTS WILL WITHER AWAY, UNDER THE LOAD. CLASS

FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

mix the above Conceptinto 110 and 180 Make sure the games being reviewed and assignments handed our each incorporate elements from interesting minors. Make discussion of said minors part of the class Discussion

Appendix D (continued): Completed Round Robin Forms

Round Robin Exercise

CHALLENGE STATEMENT: How might we ensure our students purposefully supplement their game design curriculum with courses/minors in psychology, creative writing, art, cinematagraphy, accounting, narrative storytelling, etc.?

PROPOSED SOLUTION
Come up with an unconventional way to address the challenge.

Encourage games that touch on / include other courses content. Eg. Create a game that showcases art theory / psychology / etc.
Have this class be maybe in the sophomore / junior year & mention it in the freshmen year so it gett them to start thinking about what extra class / minor they should take

---

WHY THE SOLUTION WILL FAIL
Review the proposed solution, and find a reason that it will fail.

- Students would have surface level exposure to these (1 or 2 classes) concepts by the time they built the game in sophomore / junior year, so they would build a game that only superficially touches on these topics and doesn't leverage the electives underlying importance

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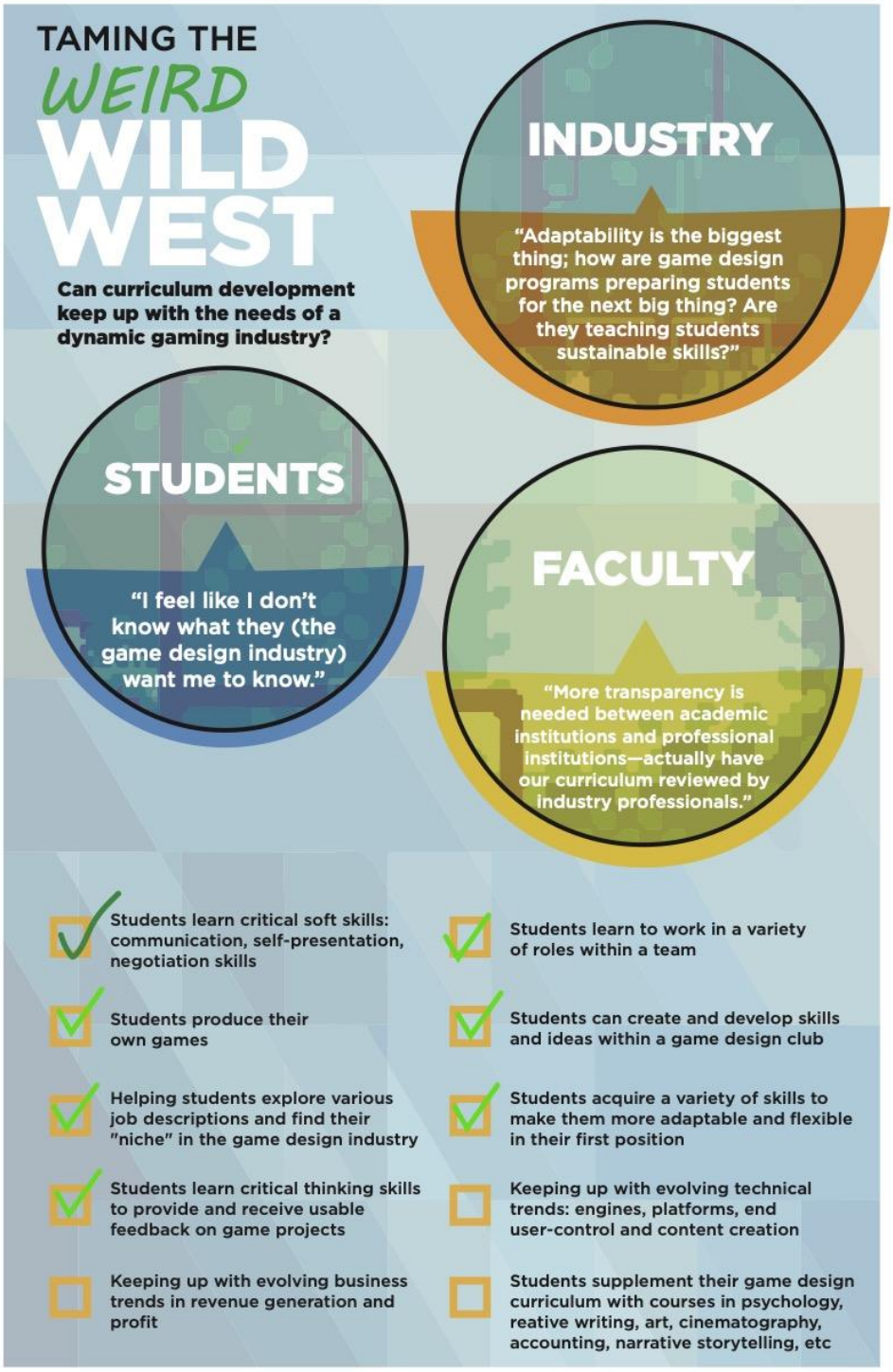
FINAL CONCEPT
Review the critique. Then, quickly generate an idea that resolves the issues raised.

If Student's Minor in these 2nd feilds of study they would get More then just a Surface level understanding By the time they Make games Relateted to the 2nd feilds jr Sr year.

Appendix E: Concept Poster for Stakeholder Interests and Program Heuristics



Appendix F: Concept Poster for the Ideal Gaming Student

Appendix G: Senior Game Design Student E-mail and Consent Form

Dear Senior Game Design Major,

You are receiving this e-mail because you have been identified as a senior-level (90+ credit hours) major in Bradley University's Game Design program. I would like to request you participate in a research study consisting of participation in two exercises designed to gather opinions and perceptions of the most important concepts and skill sets taught in the Game Design program. Below you will find more information about the research exercises as well as the informed consent form, which will be provided in hard copy for you, and verbally presented, at the beginning of the research event.

The purpose of this research study is to identify and articulate what qualities, knowledge, and skill sets are considered most valuable among Bradley University undergraduate game design students. The values and viewpoints this group will provide rich insights for collaborative exercises as well as acting as a check on other groups' perceptions and priorities.
Using the Design-Thinking strategies of Affinity Clustering and Visualize the Vote, this research will attempt to discover areas of agreement as well as divergence regarding the perceived importance of these skill sets among various stakeholder groups, the first of which being senior Game Design students. Data gathered will be synthesized for the purpose of facilitating ongoing conversations among other stakeholders (Bradley Game Design faculty, Game Design professional) which could then ultimately influence the production of curriculums responsive to the dynamically changing game design industry.

You will be asked to participate in the following exercises: Affinity Clustering and Visualize the Vote.

Affinity Clustering is a Design-Thinking strategy that seeks to reveal patterns by grouping similar data points, for the purpose of identifying commonalities "inherent, but not necessarily obvious" (LUMA Institute, 2012). The technique involves participants place individual thoughts, ideas, topics, or other relevant data points on sticky notes. One participant then explains their particular data point, and then places it on a white board. Other participants independently then place similar items/sticky notes in the same proximity as appropriate, forming groupings of similar ideas and topics.

Visualize the Vote is a Design-Thinking exercise in which students are presented multiple data sets (formed by the Affinity Clustering exercise). Each student is given three "tokens" (different-colored sticky notes), consisting of 1 token for casting an *overall* vote, and two tokens for casting specific or *detail* votes. The cumulative effect of the votes is considered and discussed among participants (LUMA Institute, 2012).

The totality of the exercises will be completed in less than one hour and will be conducted in GCC 126 at a time convenient and available for all participants. If you are initially willing to

participate, please respond affirmatively to this email, and you will then be informed of the specific date and time of the research exercises.

Thank you for your time and consideration.

Kindest regards,

Christopher Marsh

Consent Form (to be distributed before the research exercises)

Title of Research: CONSIDERING A REBOOT:
USING DESIGN-THINKING STRATEGIES TO MAINTAIN A DYNAMIC, INDUSTRY-RELEVANT GAME DESIGN CURRICULUM
Researcher(s): *Christopher Marsh, MFA in Design-Thinking Student Researcher and Instructor of Communication, Bradley University*

I ask you to be in a research study that will: explore how design-thinking strategies and exercises can be utilized to create and maintain an industry-relevant game-design curriculum. If you choose to be in the study, you will be asked to participate in two design-thinking sessions, including an Affinity Clustering, and Visualize the Vote. These group processes will take no more than one hour to complete. With your permission, we would record the results of the session with digital photographs of the final results. You will not be identified in these images by neither name not likeness.

This study has no more risk than you may find in daily life. Some risks to you may be unknown. If you decide to be in this study, you may not benefit from being a part of it.
You can choose not to be in this study. If you decide to be in this study, you may choose not to answer certain questions or not to be involved in parts of this study. You may also choose to stop being in this study at any time without any penalty to you.

There are no costs to you for being in this study. There is not payment for you taking part in this study.

If you decide to be in this study, what you tell us will be kept private unless required by law to tell. We will present the results of this study, but your name will not be linked in any way to what we present.

If at any time you want to stop being in this study, you may leave the study without penalty or loss of benefits by contacting: Christopher Marsh, 309-678-2317.

If you have questions now about this study, ask before you sign this form.

If you have any questions later, you may talk with Christopher Marsh, 309-678-2317.

If you have any injury related to being in this study, you should call: Dr. Jeffrey Huberman, Dean, Slane College of Communications and Fine Arts, Bradley University, huberman@bradley.edu, 309-677-2360.

If you have questions or concerns about your rights as a research subject or have complaints about this study, you should contact Dr. Andrew Strubhar, Bradley University CUHSR Interim Chair, Department of Physical Therapy and Health Science, ajs@bradley.edu, 309-677-2856.
Being in this study is your choice and choosing whether or not to take part in this study will not affect any current or future relationship with Bradley University.
If all of your questions have been answered and you would like to take part in this study, then please sign below.

_____ _____

Date Signature

I/We have explained the study to the person signing above, have allowed an opportunity for questions, and have answered all of his/her questions. I/We believe that the subject understands this information.

_____ _____ Signature of Researcher(s) Date

Note: A signed copy of this form will be given to the subject for the subject's records.

Appendix H: Consent Form for Faculty Participants

Adult Informed Consent—Non-survey Research

Title of Research: CONSIDERING A REBOOT:
USING DESIGN-THINKING STRATEGIES TO MAINTAIN A DYNAMIC, INDUSTRY-RELEVANT GAME DESIGN CURRICULUM

Researcher(s): *Christopher Marsh, MFA in Design-Thinking Student Researcher and Bruce Parsons, Ed.D, Radford University*

We ask you to be in a research study that will: explore how design-thinking strategies and exercises can be utilized to create and maintain a game-design curriculum. If you choose to be in the study, you will be asked to participate in a series of design-thinking sessions, including a Round Robin exercise. These exercise will take approximately one hour to complete.

This study has no more risk than you may find in daily life. Some risks to you may be unknown.

If you decide to be in this study, you may not benefit from being a part of it.
You can choose not to be in this study. If you decide to be in this study, you may choose not to answer certain questions or not to be involved in parts of this study. You may also choose to stop being in this study at any time without any penalty to you.

There are no costs to you for being in this study. There is not payment for you taking part in this study.

If you decide to be in this study, what you tell us will be kept private unless required by law to tell. We will present the results of this study, but your name will not be linked in any way to what we present.

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If all of your questions have been answered and you would like to take part in this study, then please sign below.

_____ _____

Date Signature

I/We have explained the study to the person signing above, have allowed an opportunity for questions, and have answered all of his/her questions. I/We believe that the subject understands this information.

_____ _____ Signature of Researcher(s) Date

Note: A signed copy of this form will be given to the subject for the subject's records.

Appendix I: Bradley University CUHSR Approval

BRADLEY University

DATE: 15 DEC 2021

TO: Christopher Marsh
FROM: Bradley University Committee on the Use of Human Subjects in Research

STUDY TITLE: Using Design Thinking Strategies to Maintain a Dynamic, Industry-Relevant, Game Design Curriculum
CUHSR #: 21-118-P
SUBMISSION TYPE: Initial Review

ACTION: Approved
APPROVAL DATE: 15 DEC 2021
REVIEW TYPE: Expedited

Thank you for the opportunity to review the above referenced proposal. The Bradley University Committee on the Use of Human Subject in Research has reviewed your study and approval has been granted pursuant to 45 CFR 46.110(a) [expeditable under Category 7. Research on group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs, or practices, and socialbehavior or research employing survey, interview, oral history, focus group, program evaluation,human factors evaluation, or quality assurance methodologies].

This research meets the regulatory requirements for approval as specified in 45 CFR 45. 111.Specifically, the risks to subjects are minimized and reasonable in relation to anticipated benefits to subjects and the importance of the knowledge that may reasonable be expected toresult, and that informed consent will be sought from each prospective subject or the subjectslegally authorized representative. The informed consent document meets the regulatory requirements as outlined in 45 CFR 46.116. Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the consent document.

All vita and ethics certificate are on file.

Please Note: Research must be conducted according to the proposal that was approved. Any revisions to the protocol must first be approved by the Committee on the Use of Human Subjects in Research (CUHSR) prior to implementation and that substantial changes may resultin the need for further review. Please submit a Request for Minor Modification of a

Current Protocol found on our website at https://www.bradley.edu/academic/cio/osp/studies/cuhsr/forms/should a need for a change arise.

While no untoward effects are anticipated, should they arise, please report any untoward effectsto CUHSR immediately.

Please retain copies of all records pertaining to this study for a minimum of three (3) years fromthe study closure. Be aware that some professional standards may require researchers to retain records for a longer period of time.

Committee on the Use of Human Subjects in Research – 100
Kauffman1501 W Bradley Ave.
Peoria, IL 61625

When the study is complete, please file a final status report. A form can be found on our website at https:/www.bradley.edu/academic/cio/osp/studie/cuhsr/forms/. A continuing review is NOT required pursuant to 45 CFR 46.109(f)(i).

This email will serve as your written notice that the study is approved unless a more formal letteris needed. You can request a formal letter from the CUHSR secretary in the Office of Sponsored Programs.

Andrew J Strubhar, PT,
PhDCUHSR Chair