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James Hutson

Ben Fulcher

Joseph Weber

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**James Hutson, Ben Fulcher, Joseph Weber**

Lindenwood University, Missouri, USA
Email: jhutson@lindenwood.edu

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## Abstract

The gamification of learning has proven educational benefits, especially in secondary education. Studies confirm the successful engagement of students with improved time on task, motivation and learning outcomes. At the same time, there remains little research on games and learning at the postsecondary level of education where traditional pedagogies remain the norm. Studies that have been conducted remain almost exclusively restricted to science programs, including medicine and engineering. Moreover, postsecondary subject-matter experts who have created their own gamified experiences often are forced to do so on an *ad hoc* basis either on their own, teaching themselves game engines, or with irregular support from experts in the field. But to ensure a well-designed, developed, and high-quality educational experience that leads to desired outcomes for a field, a sustainable infrastructure needs to be developed in institutions that have (or can partner with) others that have an established game design program. Moreover, such a design-based learning approach can be embedded within an existing studio model to help educate participants while producing an educational product. As such, this qualitative case study provides an example of the process of operationalizing a game design studio from pre-production through post-production, drawing from the design and development of the educational video game *The Museum of the Lost VR* (2022). The results, resources, and classification system presented are scalable and provide models for different sized institutions. Methods to develop a sustainable infrastructure are presented to ensure interdisciplinary partnerships across departments and institutions with game design programs to collaborate and create educational experiences that optimize user experience and learning outcomes.

## Keywords

Gamification, Game-Based Learning, Pedagogy, Game Studio, Project

Management, Team Structure

## 1. Introduction

The possibilities provided through the gamification of education are becoming more broadly accepted beyond secondary education. The softening has been achieved through gaming being adopted in many areas of daily life for users from a variety of backgrounds and ages. When applied to education, gaming can ensure learning materials to become more engaging and motivating. Such examples already include Khan Academy and applications like Duolingo. The same methodologies used in these examples are being used more and more in the virtual classroom, as well [1] [2]. One reason that gamification is being adopted is that active and participatory learning strategies are superior to passive alternatives to engage learners. Recent studies have demonstrated that there is greater retention and engagement in the learning process if there is purposeful participation included in lesson plans. Dastyar [3] confirms that the role of motivating factors that work in tandem with participatory learning increases both motivation and academic achievement in students. At the same time, games are also emblematic of a broad cultural shift toward said participatory culture and offer ways to model the same educational experiences. For instance, the act of gaming and gaming communities move players/students beyond passively consuming media/information to actively participating and producing an experience through their interaction with the game itself and other players. Moving beyond playing games, the process of designing, evaluating, and developing said experiences itself can be an intentional educational strategy through design-based learning (DBL). Students involved in the creation of gaming experiences have the ability not only to add to their portfolio but gain valuable skills for a variety of industries in their role in a team for a game studio. The process aligns closely with the ADDIE model for instructional design (**Figure 1**). The same models for DBL as a pedagogical approach and embracing participatory culture may be adopted by educators as in this study [4] [5] [6].

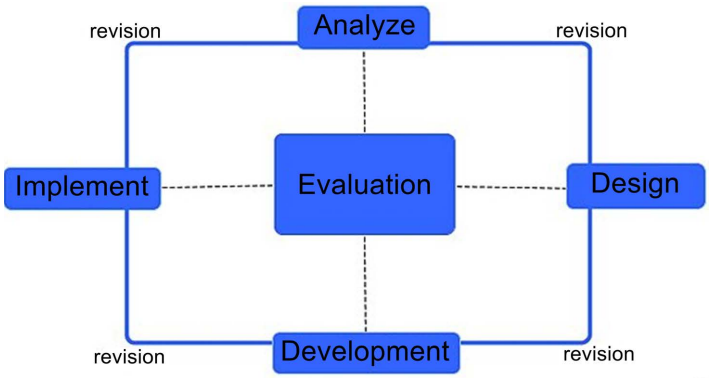


**Figure 1.** ADDIE model of instructional design.

There are various strategies educators at different levels can take when gamifying their curriculum. For instance, activities within the classroom itself may be gamified, such as adding point systems to responses and discussions to full immersive adventure experiences that last an entire course [7]. Others who wish to leverage the benefits of video games to engage and motivate students, improve their overall experience in the course [8]. Regardless of the resources of an educator's institution, there are many freely available educational video games on the web, such as ABCYa with experiences from pre-K to grade 6. Similarly, serious games may be found on FUNBRAIN and Education.com through libraries of games, videos, and books for K-8 students. Yet, while there are many existing resources available, especially with regards to secondary educational gaming, postsecondary educators are left with few choices aside from the publisher resources included in e-textbooks, such as interactive readings and self-quizzing options. Gamified experiences tailored to various disciplines remain out of reach for most college students who would benefit from a more participatory approach to teaching and learning. Studies on the positive impact of gaming for college students often look at existing video games and consider how different genres (role-playing games [RPG], first-person shooters [FPS], etc.) may support developing certain skills, such as critical thinking or teamwork [9]. The ability to create an intentional learning experience to support a specific outcome designed by a subject matter expert (SME) in the field not only leads to a better understand of the topic being covered, but also can more readily align with the additional durable skills on which current research focuses [10] [11] [12] [13]. But subject matter experts, no matter how accomplished in their fields, cannot accomplish this task alone; an infrastructure, supported by constituents both internally and externally, must be designed and implemented.

One strategy to address the issue of providing support for faculty wishing to create a gamified experience and serious game for their courses, while also giving students design thinking experience, is for institutions to develop a sustainable infrastructure built on the substructure of a game design program [14] [15]. Instead of merely having a SME work with a team on an educational product, the experience itself can be a learning experience and extend beyond designers and coders. Students in the discipline of the SME along with those from game design can collaborate using DBL for project-based learning to gain skills just-in-time (JIT) as the iterative process of design unfolds. With an internally funded grant, a team of faculty, graduate students, contractors, and consultants conducted a study on the potential of such a model. The following treatment presents the results of the study to operationalize an educational game studio at a mid-sized, private Midwestern university through the creation of the video game *The Museum of the Lost VR* [16]. The process of designing a successful production schedule and team structure is presented with recommendations for all phases from pre-production, production, post-production, and, finally, distribution. While the results from the case study are ideal for institutions with a game design department with a graduate program, the design is scalable and provides

models for institutions of various sizes and resources. Furthermore, the pedagogical approach of DBL in the process of gamifying educational experiences provides a model for all types of gamification lessons.

## 2. Literature Review

A broader variety of learners have been engaged as of late using educational games and the gamification of instruction in the classroom [17]. The use of game-based instruction is certainly not a recent phenomenon, but the broad adoption of recreational gaming for a more heterogeneous population along with ready availability of the technologies to create gaming experiences have coalesced to prompt adoption of serious games for educational purposes, as well [18] [19]. The watershed moment has arrived at the ideal moment as educators struggled and failed to engage students in the post-COVID era through many motivational strategies. The standard extrinsic motivation strategies employed in education, unfortunately, are effective only for a short time. On the other hand, gameplay can sustain attention and engagement for longer periods [17].

### 2.1. Theories for Gamification in Learning and Education

The major theories of learning when considering gamifying education may be broken into four categories. Motivation, Self-determination, Achievement Goal, and Social Learning or Situated Learning theories may all be considered when considering a gaming strategy, however, the one selected will depend upon the field, lesson, activity, or outcome desired. As an example, should motivation be the most significant outcome, educators may consider Motivation Theory for the experience. Studies have borne out that motivation is the most important element for a successful learning experience in a gamified environment [20]. Self-Determination Theory is also relevant as it builds on the dual system as a macrotheory of motivation [21] [22]. Building on the extrinsic motivational theory, self-determination assumes that a learner's motivation is influenced by the immediate learning environment, and both social and cultural factors need be considered. In order to further develop inborn psychological desires to learn and achieve, educators may offer several options during instruction to ensure several variables are addressed. These variables include the perception of students that they have the ability to complete an activity, feel in control, and enjoy a sense of community with other learners.

Turning to Achievement Goal Theory, the related macrotheory of gamification takes for granted that learners are motivated by a desire to complete a task or reach a specific goal. [23] [24]. Given the interest in achievement, the theory has two specific goals which include performance and mastery [25] [26] [27]. The more self-motivated a learner is, the more they will appreciate and relate to mastery goals. These goals relate to an innate desire to understand a concept, finish a task or acquire abilities. Alternatively, learners who look to outperform others at the same task would fair better with performance goals, as these are

"ego-involved". These learners are more interested in comparing themselves to others in a social setting than the actual learning outcomes associated with the task [28]. Along the same lines, Social or Situated Learning Theories also consider the significance of social motivations and learning environments. However, instead of competing with others in a social setting, these learners do better observing others and their behaviors [29]. In order to be successful, educators need to first identify a student to act as a model for others to observe and then model their own behavior on once witnessing the outcomes of their actions.

### 2.2. Game Design Studio

However, before implementing these considerations of student motivation, educators need additional technical and operational support. Gamifying an experience requires both subject-matter expertise and a technical knowledge of game mechanics and other specialized skills if developing video games. An example of an educational institution addressing these concerns, and the operational and workflow issues inherent in developing educational video games is the Massachusetts Institute of Technology (MIT). The approach took the shape of a Comparative Media Studies (CMS) project that aimed to consider real-world challenges through academic theories of games. Given the project's success, MIT further expanded in 2006 with the establishment of the Singapore-MIT GAMBIT (Gamers, Aesthetics, Mechanics, Business, Innovation, and Technology) Game Lab. Through "applied humanism", games are created within an academic context. The goal of the project was to bring academics and researchers "down from the ivory tower" to demonstrate the values of their theories through building games ([30], p. 256). In the summer of 2007, 30 students from Singapore were brought for a nine-week internship to work with MIT graduate and undergraduate students to create six games. Each team had seven members: two programmers, two artists, a game designer, a test lead, and a project manager. In addition, a two-person audio team provided sound and music support for all development teams. Given the constraints of time, top-down oversight was not possible, and so the "Scrum" project management model was adopted from industry. This model requires agility in project management and acts on new findings, unexpected outcomes, and user feedback quickly and efficiently. Teams would iterate and develop a playable build of their games every two weeks and receive feedback. The goal in this instance was for each team to demonstrate a single research idea in their game project [30].

Another example uses a more open pedagogical approach. 038 Games (https://038games.nl/), a serious gaming studio, works with clients that bring a specific problem or learning outcome that needs to be addressed through gamification. The company offers a minor and educational experience open to anyone who wishes to enroll from around the globe. In 20-week cohorts, students with various backgrounds work on as many as 15 different projects annually. The role of the instructor in the experience is as a coach as they do not provide

lecture content. Instead, the instructor serves as a project manager for the team. Team building activities are included in the course requirements for the minor. For instance, coders are set to work on the UI elements while art and design students begin work on the concept art for the game. Examples from the studio include an escape room, which can include a variety of discipline-specific information, and players are then encouraged to work together, learning new information in order to exit the room. The collaborative interactions between researchers and subject matter experts (SME) and game designers and developers in the two examples above provided a starting point for our study in considering the logistics of such an enterprise.

## 3. Methods

### 3.1. Game Design & Production Process

#### 3.1.1. Team Structure

The roles outlined in the grant proposal ensured faculty and student participation, along with outside contractors to fill any skills gap. The process followed recommendations for game development and documentation [31] [32] [33] [34]. The resident art historian served as subject-matter expert (SME) and primary investigator (PI) for the grant. The SME created the Game Design Document (GDD), preliminary level design, recorded audio clips, provided text-based information to be included on pedestals and for quizzes. The resident game design faculty member acted as project manager and oversaw meetings, kept updated files in a shared cloud drive for the team, and provided trouble shooting for team members attempting new functionality in Unity. Two game design graduate students served as game and level designers for the project; an external coder was contracted for the UI/UX elements, such as the functionality of the main menu and quizzes; and, finally, a consultant who had developed educational historical games advised on process. Only the two faculty members could meet physically, and thus the project team needed to adopt the strategies of virtual (remote) teams (**Figure 2**) in dimension of time, space, and culture [35]. In fact, the entire team never met together physically. The benefits of such a team include flexibility and a broader skillset, though motivation need be considered [36]. At the same time, the management structure was more formal given the requirements of the project and expertise required of the team to utilize the decentralized virtual team model. As the project required both expertise in the game engine, asset creation and management and development as well as content expertise in the material being covered, the matrix team model was adopted for logistical purposes. In the "two-boss system" (**Figure 3**), individuals report to different managers for various aspects of work due to expertise. Throughout the project, the team met with both project managers and received feedback and instruction based upon the expertise needed relating to design, mechanics, debugging, and instructional material. As such, a hybrid team structure was developed that used both (**Figure 4**) the "two-boss system" and the virtual communication strategies for the project.

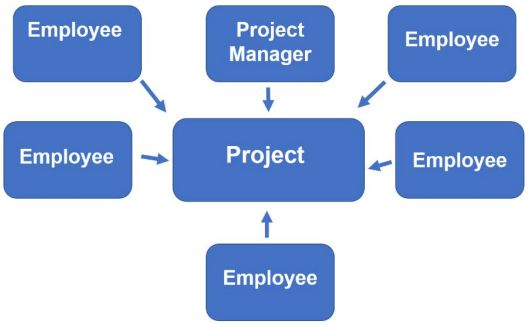


**Figure 2.** Virtual team diagram.

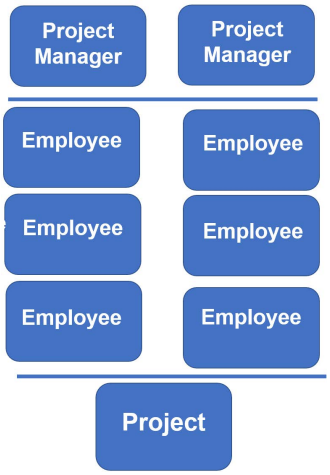


**Figure 3.** Matrix team diagram.

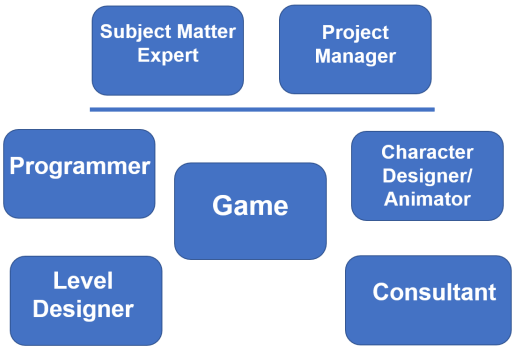


**Figure 4.** Hybrid team diagram.

### 3.1.2. Pre-Production

The initial design and production of the educational game was divided into three phases-pre-production, production, and post-production. The project ran from January-April of 2022. After securing internal funding, a pitch deck was developed in early January, which served as the GDD for the project. The document served as a centralized vision for the project and helped communicate expectations to team members, provide context and background for the project, and outline necessary game mechanics and components for the project [37]. During the pre-production process, planning for the project was completed and prelim-

inary documents were constructed, including the GDD. The preproduction phase saw team members determine what tools and versions would be used for the project development. Unity game engine was decided due to team familiarity. During this phase, sprint meeting times were decided as well as communication platforms (Microsoft Teams and Discord), task delegation, and individual expectations. In this phase, team members were selected, and the game's core play loop was defined.

#### 3.1.3. Production

During the production phase, work in-engine began with team members being relegated tasks and game mechanics construction began. During this roughly twelve-week phase, the team worked on modeling or finding game assets, designing game mechanics, developing User Interface (UI) components, and general troubleshooting. This phase also saw the widest delineation from the predetermined GDD sprint schedule. Regular spring meetings were conducted every week-every other week for 15 minutes and a full hour report alternating weeks. During the meetings, each team member reported on their activities for the past week and had questions answered on the educational goals of the games and identified technical solutions for player engagement. All meetings were conducted synchronously via video conference platform, and, in fact, the team never met physically being located in different regions around the United States. In general, the early stages of the project found that the development team was completing tasks much quicker than initially outlined in the GDD. During the first two sprint meetings, all expected tasks were completed before the outlined dates in the GDD. Because of this, the development process saw a shift in workflow towards the end of the expected timeline. Basic locomotion and game mechanics were developed early on and provided more time later in the phase for UI creation and fixing game elements that were not working. By the end of the production phase, the team had developed working mechanics for all project Minimal Viable Product (MVP) goals.

#### 3.1.4. Post-Production

Once all levels had been completed and a beta version was ready for testing, the team oversaw recruitment and distribution of the build for the playtesting. In this final phase of post-production, marketing content was developed in the form of a copy and a trailer for the game, as well as final touches were to be made in the game. A period of playtesting lasted two weeks in which participants would complete a survey after playing the game to facilitate critique and feedback. These surveys would be used to pinpoint bugs and problems in the game for fixing during this period. Game platforms such as Steam and Itch.io were also reviewed for future submission. This phase also saw the game project being accepted to a virtual conference dedicated to gamification in education.

## 4. Results

The challenges faced during the design and development of the serious educa-

tional game reflect that in the literature [38]. To improve upon the development and evaluation processes, the following recommendations and insights were gleaned from the team at the close of the project. For instance, the pre-production phase should have been preceded by a finished GDD and Level Design Document (LDD). The pitch deck was created after the team was assembled, and a more efficient design process would be made possible with a fully fleshed out project prior to the development cycle. For such a visually rich project, reference images and examples should have been readily available from the outset for the whole team. To facilitate this process for a PI and/or SME, a template should be developed for internal use that can be filled out through backwards learning design. Additionally, game development documentation and institutional development policy should be created unique to the organization's needs [39]. Creating an expanded onboarding package for new SME would also be useful in what to consider, much like a design document in working for a client. The training should also include building expectations early on in the timeline so that the SME avoids continually adding additional functionality and UI elements as the project progresses.

In the pre-production phase, recruitment should be of paramount concern and preparations should be made to ensure the most qualified candidates can be identified efficiently and on the project timeline. Criteria for selecting candidates should include demonstrable fluency with the game engine to be used in the project and a portfolio demonstrating past work. At the outset of the project under discussion, a call for portfolios was sent out to the entire game design community on and off campus. However, even though the positions were paid, only two students submitted portfolios. One asked if the game produced for the grant could also apply to his thesis project. One option for departments with graduate game design programs would be to consider building such projects into thesis classes each term so that the student's final deliverable would be a game for their portfolio. Alternatively, the team recommends relying on faculty recommendations for qualified candidates and reaching out to them individually and directly to solicit participation.

The production phase progressed quickly and smoothly. The recommendations for repeating such success follow the process outlined above. The timeline was appropriate for the group given the scale of the work. However, the scope of the project, number of levels, original assets to be created, etc. need be considered to establish a realistic development timeline for other projects. The grant budgeted 30 hours for the project manager, 20 hours for each game designer, and 35 hours for the coder. While the graduate students in the role of game designer found the time allotment to be ideal, they did note that would not be the case for a full-time student or those with other responsibilities. Also, the project manager and coder went over their allotted hours, thus the team recommends budgeting more by percentage for these roles.

With regards to the milestones and check in timeline, the group repeatedly noted how productive these were in terms of providing small goals to reach each

week and getting regular feedback. Additionally, the regular meetings build rapport and camaraderie among the group, which leads to more effective teamwork. The Discord provided the opportunity to ask small, technical questions and have them answered quickly on an as-needed-basis to keep the project moving ahead. The project manager sent out weekly assignments, breaking down the expectations for each team member and providing a clear timeline and goals. The project manager also met with the team outside of weekly meetings to address any outstanding technical issues, such as advanced animations and character rigging. Other communication software and strategies may also be considered:

- Trello—tasks assigned per sprint review
- Slack—feedback on art process, general announcements, DMs on specific questions
- Teams—video conference sprint reviews
- Google Drive—storage of assets, archive of presentations, additional files
- Google Slides—sprint review template

The post-production phase was truncated and could be expanded. Working under the constraints of the hours identified for the internal grant, the schedule for semester end dates, and availability of playtesters, the team agreed that more time should have been allotted for this phase. With the playtesting taking place over the course of two weeks, there was insufficient time to address all of the recommendations from respondents of the survey. Finally, sharing files on Google Drive did prove to be sufficient for the scope of the project, but having multiple versions that up to five individuals were working on that needed to be merged and updated continuously was laborious. Project manager recommends moving to Git Hub or using other version control software.

## 5. Recommendations

### 5.1. Initial Considerations

The first consideration for any organization (or individual) planning to create an educational experience would be to assess capabilities and capacities at hand. Resources and support available will determine the size and scope of the project that may be undertaken. In many instances the SME themselves may have skills in coding or game design and development that would enable the completion of a small project or minimum viable product (MVP) that can be used to garner more funding. However, for large immersive experiences with multiple levels, assessments, and UI elements, a team will be necessary, especially since the goal of an educational game studio would be to afford the creation of experiences from a range of disciplines. At the same time, the team need not be solely comprised of individuals from within the organization: partnerships and an interorganizational network should be cultivated to maximize skills and resources. For instance, one may have subject matter expertise with researchers and scholars on a given topic and another technical expertise and personnel to develop a pro-

posed GDD.

### 5.2. Structural Considerations

Regardless of whether an institution has the subject matter expertise or a game design department with technical expertise to realize educational gaming experiences, some guidelines for team and studio structure should be considered. For instance, results from the study confirm the necessity of having a clear project management plan supported by multiple avenues for regular communication and key roles in place. The size and scope of the project will determine the best path forward with regards to team structure, communication strategies, and incentives for participants. As noted, if the project involves a single-scene cinematic, VR mapping of one location, simple immersive simulation or single-level video game, then a small team will suffice depending upon their set, whereas large, multi-level games, full cinematic or multiple-level or location VR mapping will require a larger team. The timeline for team springs should reflect the size and duration of the project. For instance, if a project is to be completed within a single semester (between 3-4 months), weekly check-ins for the team to connect and report are advisable. On the other hand, if a project is slated for two semesters (9 months or longer), sprints may be stretched to 2 - 3 weeks. The following suggested structural models are designed to accommodate mid- to large-sized gamification projects.

*Option* 1: *Internal Game Studio*

The first option would be to design a studio that is funded either by an internal endowment or through experiential learning credit. Regardless, whenever possible, the project manager should consider compensating students, especially undergraduates, to ensure a high caliber of work produced. Funding for student and other team members may also be provided through an endowed fund that is renewable annually and used for internal projects for research in general or specifically for gamification projects.

The team structure need be designed to accommodate the needs of those involved: whether the team is local or will work virtually, how much and what variety expertise throughout the development process will be needed, and what the timeline will be for the final deliverable. In the internal model, a faculty member will need a course release(s) or additional compensation to oversee management of the teams and projects, or an organization may hire a full-time staff member or post-doctoral student for a fellowship.

*Option* 2: *Collaborative Game Studio*

The second option would be to have an educational institution partner with another external entity, either a for-profit studio or another institution that has a game design department. In the external partnership model, students, faculty, and staff would still be involved in the creation of projects. The approach would be best suited for those who have SME but not a game design program proper at their own organization. As such, a faculty member with expertise in an area with

the complete GDD would work with students in that field to provide the instructional materials (audio recordings, quizzes, etc.) and oversight. In this common instance, the external partner would be providing technical expertise and, if an educational institution, experience for their own students in game design or computer science.

*Option* 3: *Hybrid Game Studio*

The hybrid model can be staffed by internal personnel or through the collaborative model. In addition to creating bespoke educational experiences for use in higher education classes, this hybrid approach also gives students real-world experience in working with clients in the for-profit sector. Establishing an LLC will be required to operate and handle revenue generation outside of the educational non-profit sector.

### 5.3. Roles in Teams

There are many variables that need to be considered when identifying who should be on a project team. In deciding on these roles, some questions should be answered that also affect the timeline and budget.

- Does the SME already have all the research required for the project completed and instructional materials designed?
  - If not, consider extending the timeline and including research assistants to budget
- Is the project being created using hardware and software familiar to the team?
  - If not, consider including a collaborative model or contractor to fill gaps in knowledge or include in timeline and budget to allow for upskilling team
- Are there specific tasks to be completed that require specialized skills or knowledge?
  - Identify these tasks and the associated expertise needed
  - Consider budgeting average hours per week per role *(note*: an individual may fulfil multiple roles, thus alleviating the duplication of costs for the project)
    - Game Director (40+ hours/week)
    - Art Director (40+ hours/week)
    - Designer (40+ hours/week)
    - Programmer (40+ hours/week)
    - Sound Design (40+ hours/week)
    - Tech Art (40+ hours/week)
    - UI/UX Designer (40+ hours/week)
    - 3D Character Modeler (20+ hours/week)
    - Assistant Programmer (20+ hours/week)
    - Character Texture (20+ hours/week)
    - Rigging (20+ hours/week)
    - Concept Artist (5 - 8 hours/week)
    - Storyboard Artist (5 - 8 hours/week)

- 2D Textures Artist (5 - 8 hours/week)
- 2D Cinematics (15+ hours/week)
- 3D Character Animation/Rigging (15+ hours/week)
- 3D Modeler/Environment Artist (20+ hours/week)

### 5.4. Role of the SME

The role of the subject matter expert (SME) may shape the roles of the team, as well. The SME may be internal or external to the institution; their relationship with the project may be direct or indirect. Therefore, the following roles are proposed for the SME that range from most to least involved.

- *Project Manager*: In this role, the SME provides both subject matter expertise in a given area for the topic to be gamified and possesses a working knowledge of game design and production. The team structure is best suited to smaller projects whereby a small team may be recruited to support development. The SME may also serve in the "two-boss system" as a project manager.
- *Team Member*: In this role, the SME serves as dedicated member of development team throughout process after completing the initial GDD and/or LDD, depending upon scope of project. The team is led by a project manager with expertise in design and development, but the project may be complex and evolving, requiring the SME to remain in the design spring meetings to answer questions and trouble shoot.
- *Subject Expert*: In this role, the SME provides the initial premise for game and complete description of concept and mechanics via GDD, but (much like in the instructional design process) hands off the materials to the development team and is contacted on an as needed basis should clarification on specific elements arise. The success of this role relies upon a thorough Game Design Document template being provided and consulting meetings completed with a game designer/developer to ensure all information is known from the outset and a fully realized experience may be completed separate from the original author.

### 5.5. Financial and Curricular Considerations

In all the options outlined above, the work performed by students can be embedded within curricular, co-curricular or extracurricular elements. The appropriate selection will depend upon the option selected above and whether the curricular offerings exist, such as with a game design and development or computer science program that uses game engines. As such, Option 1 would lend itself well to embedding projects within the game design curriculum proper. In instances where there may not be such a program, such as with Option 2, offering experiential credit for students across a range of disciplines is a better option. Finally, Option 3 may be used with co-curricular or extracurricular considerations, such as direct compensation for work on projects.

## 6. Conclusions

Emerging technologies continue to disrupt higher education models. Educators are increasingly exposed to generations of learners that expect engagement and participatory experiences. One solution outlined in this study is to take advantage of existing resources within and external to institutions. The software and game engines that undergird the creation of gamified learning experiences are free for educational use. The asset stores for the major engines, including Unity and Unreal Engine, boast thousands of free assets to populate and may be recombined for an unlimited number of scenarios and learning experiences in different fields. Where those interested in pursuing gamification of learning run aground is in finding those with the expertise or the time to upskill themselves or their students to take advantage of these resources. With that in mind, the results of the study encourage administrators, IT, and centers for teaching excellence to hold workshops and provide free training to faculty and staff. Incentivizing upskilling with professional development recognition, modest compensation, and/or certificates awarded via learning academies will improve buy in from constituents. However, support from the administration is key—an institution must make the strategy part of their institutional goals and put resources behind the initiative. Future research is recommended to scale out the designs outlined in here and determine how additional efficiencies may be leveraged in a given institutional structure.

Institutions should remain relevant in the coming decade. The new participatory culture demanded by incoming students needs be recognized through engaging instructional material. Gone are the days of reading a textbook, listening to a lecture in class, and then taking an exam. In the information age, and as digital natives, students have near limitless access to information at their fingertips in real time and on demand. The role of educators will increasingly be to step aside and facilitate active learning strategies, stepping in, not as the sage on the stage, but as the SME who can assist with developing durable skills, information literacy, and higher-order thinking to apply knowledge in various contexts. The gamification of education is one such tool at the disposal of educators today to assist in this way and ensure that immersive learning experiences are meaningful, impactful, and engaging.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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