

IDT 6720 Final Game Design Report

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IDT 6720: Digital Game-Based Learning

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For many adults in the United States, alcoholic beverages play a key part in many social gatherings. Craft beer, local breweries, and home brewing are becoming increasingly popular, as is the need and desire to understand more about the brewing process. Through EduBrew, we intend to help individuals learn more about what makes up the alcoholic beverage they drink, the brewing process (should they like to become a home brewer), and how beer makes it from the brewery to their fridges. Because consumers want to be more aware of the products they are ingesting this game will help them to be better informed consumers. Additionally, many consumers want to know the story behind their food and drink and EduBrew will allow them a glimpse into the world of the beer making, marketing, and distribution processes.

EduBrew Overview, Target Audience, Learning Goals, and Learning Outcomes

When designing our game, our team was interested in creating an experience that targets adults who are twenty-one and older and enjoy alcoholic beverages, especially craft beer. Our goal is that players will learn more about not only the ingredients in the product they are consuming but also the processes that go into producing, marketing, and distributing beer. Because the ultimate goal of our game is to teach players about the beer making process, we determined that EduBrew would be a creative name that tied together the education components of the brewing process in one clever name. By playing our game, we hope that players will achieve six learning goals:

1. Identify different kinds of beer
2. Identify ingredients in beer
3. Identify brewing equipment
4. Understand the different chemical reactions when making different kinds of beer

5. Match ingredients and equipment that work in tandem to brew beer
6. Evaluation beer distribution and marketing practices

Ultimately, by playing our game, we hope players will have a better understanding of:

1. How ingredients are grown, sourced, and prepared for the brewing process
2. How ingredients are combined and cooked to create brewed beverages, including the five main steps (mash, boil, cooling, sugar to beer, bottling) which must be followed to create the brew
3. How to package, distribute, and market their beverage to ensure profitability

The following sections will detail how we intend to reach these learning goals and outcomes, motivate players to continue, and evaluate their learning and will be framed using lenses described by Schell in his book *The Art of Game Design: A book of lenses*.

EduBrew Description

Welcome to the world of beer! Source ingredients, create recipes, and start your own brewery with EduBrew! You will work with your team to explore the world of beer-making, found your own brewery, discover the best marketing practices, and develop a line of breweriana.

1. **Sourcing ingredients** Beer does not just magically show up in your fridge! Start at the beginning by identifying the ingredients required in the brewing process, picking the highest quality materials, and learning about the purchasing process.
2. **Brewing** After finding the best ingredients, you will enter into your brewery to learn about different brewing equipment and their functions. After you get an understanding of the basics of brewing, you will learn how to combine your ingredients to brew a variety of beer types and develop your own, unique recipes.

3. **Packaging, marketing, & distribution** You have the knowledge. You have a great product. Now it is time to get it out there! You and your team will work together to develop your brand by coming up with your company name and designing the logo/artwork and packaging for the bottles, cans, coasters, bottle openers and other products. After understanding what your brand is about, promote your brewery, create partnerships with bars, retailers, and restaurants, and get your brews out to the public. Grow a local following, keep promoting your brewery, and watch as it gains regional and national recognition.

Motivation and Learning Theory

Establishing motivation is perhaps one of the most important parts of designing a game, as without it, players have no reason to play, and therefore learn. EduBrew uses many motivational strategies to make sure that students not only finish the game, but also become recurring players furthering their knowledge of beer. The motivational strategy used rotates around challenge and goals, control and choice, fantasy, and recognition.

Challenges and goals point the user in the direction that they will go when using a program. Furthermore, the addition of clear progression motivates users to continue playing until they have completed everything. When starting out users are given a clear goal to achieve (launching their own beer brand), and the steps that they can take to get there. Furthermore, the very challenge of accomplishing this task provides motivation, as challenge is a central tenet of intrinsic motivation (Malone, 1987). EduBrew also utilizes a progression bar as a tool to increase motivation. Seth Priebatsch describes the use of progression bars when discussing the progression dynamic in his TedTalk (Priebatsch, 2010), as a powerful tool utilized all over the gaming industry to drive motivation. An example of this would be a leveling system in an RPG

game. Challenge is also engaged in the idea of “Flow” put forth by Csikszentmihalyi. Flow can only be achieved when a student is faced with a task that balances challenge and difficulty. If a task is too difficult a student will feel discouraged because they feel they will never be able to accomplish the task, and if a task is too easy a student will be disinterested because there is nothing engaging their minds (Csikszentmihalyi, 2008).

Control and choice is another element the Malone and Lepper identify as a key element in gamification (Malone, 1987). In EduBrew players are given the chance to guide their own brewing education with a couple of tools. All sections are always available to navigate so students are able to go back and reference previous sections, as well as learn at their own pace expanding motivation. Furthermore through the addition of the brewing mini game, where students can plug in different ingredients into different parts of the brewing process, learners are provided both control and choice, as well as being provided an environment where students can take risks. This mechanic builds a risk-taking environment, which is an element of what makes video games good (Gee, n.d.).

Fantasy is also utilized in EduBrew by letting prospective brewers step into the role of owning an actual brewing company. Malone and Lepper state that fantasy can provide excellent metaphors for real life situations which can drive motivation. EduBrew makes use of endogenous fantasy, as the fantasy is dependent on the content (Malone, 1987) in this situation. Malone and Lepper also discuss the emotional side of Fantasy as well. By allowing our students to step into the shoes of a brewery owner allows students to feel a sense of power and ability to overcome situations they would not be able to overcome in real life (Malone, 1987).

EduBrew also makes use of recognition as a motivational element. Students will be rewarded with badges which not only provide recognition but also a status symbol. Malone and

Lepper acknowledge the need for students to be recognized for their work, but Seth Priesbatsch adds another level to recognition during his TedTalk. Priebsatsch points to not just recognition, but recognition of status as a motivational dynamic (Priebsatsch, 2010). When people see status symbols they desire to have them as well, so by adding a badge system to EduBrew students are able to show their progress and be recognized for it, as well as show them as status symbols to motivate other students.

Logic Model

For a player to learn they must proceed through the game, and to continue playing there must be some motivational elements to hold the player's interest. In the logic model below (Table 1) several motivational elements from the book *Making learning fun: A taxonomy of intrinsic motivations for learning* by Malone and Lepper are defined (Malone, 1987). Additionally, Table 2 details the learning goals of EduBrew and how the player will show their comprehension of the material.

Table 1*Motivation In EduBrew*

Motivational Elements	Manifestation in Game
<p>Challenge and Goals</p> <p>“That we seek and enjoy activities that offer us a challenge is a central tenet of many traditional theories of intrinsic motivation” (p. 230).</p>	<p>EduBrew gives short term (learn and identify ingredients and equipment) and long term (brew and market beer) goals that motivate the player to learn the brewing process. The short-term goals also prepare players to face the more challenging long-term goals. The learning goals are further defined below.</p>
<p>Control and Choice</p> <p>“One of the most frequently cited explanations for why people find computer games so captivating is that these games give their players a powerful sense of control” (p. 237).</p>	<p>The game gives players control over how they brew their beer to make it their “own” and see the result of their choices when the brewing is completed. In addition to the brewing process the player chooses the branding and marketing of their product.</p>
<p>Fantasy</p> <p>“Endogenous fantasies can also provide useful metaphors for learning new skills, and they can provide examples of real-world contexts in which the new skills could be used” (p. 24).</p>	<p>The player is provided able to act out the fantasy of owning a brewery, so that the success of their learning is tied to the success of their in-game brewery business.</p>
<p>Recognition</p> <p>“...There is some general agreement that we enjoy having our efforts and accomplishments recognized and appreciated by others” (p. 244).</p>	<p>EduBrew will recognize players’ progress with achievements in the form of badges. The badges will be granted after key points in the game are completed and will be a way for players to show off their brewing knowledge.</p>

Table 2*Learning Goals in EduBrew*

Learning Goals	Manifestation in Game
Identify different kinds of beers	The player learns what ingredients are needed and steps need to be followed to brew different types of beer. The player will choose a type they want to make, then brew a beer from start to finish and find out what if they correctly brewed the type they were going for.
Identify ingredients in beer	The player is shown what ingredients are needed to brew beer, and what determines their quality. The player will then be assessed on how well they can identify ingredients.
Identify brewing equipment	The player is shown different equipment and explained how it is involved in the process of brewing beer. Then the player will have to choose the correct equipment when brewing their beer.
Understand the different chemical reactions when making different kinds of beer	The player learns the chemical reactions that make up the brewing process from instructional videos and gameplay.
Combine ingredients together with correct pieces of equipment to brew different kinds of beer.	The player is then tasked with using what they have learned so far to source ingredients, use the correct equipment and add the correct ingredients in the correct order to create a certain type of beer.
Evaluate beer marketing and distribution practices	The player learns about types of marketing and distribution available and chooses what they think is right for their beer. The game then evaluates the effectiveness of the plan and scores their popularity and profitability.

Lenses

There are countless components that go into and create the essence of a great game. Throughout this next section, EduBrew will take a deeper look into just five areas of EduBrew's game design inspired by a series of lenses highlighted in Jesse Schell's book, *The Art of Game Design*. Schell ultimately goes on to highlight over 100 different lenses that should guide a designer's consideration when constructing a new game. Ending with 112 and the infinity lens, considering the secret purpose, is it worth the time, and why (Schell, 2015). Having agreed that the benefits of developing EduBrew are worth the effort, the following five lenses played a role in the development of EduBrew.

1. Lens #13: The Lens of Infinite Inspiration

When exploring the creation of a new game, one must consider how to make the experience relevant and understandable (Schell, 2015). Schell highlights this lens by connecting to known experiences and illuminating ways that portray those experiences through the game. One way that EduBrew tackles this experience is through the game aesthetics. The very essence of a beer glass, bub, brewery background provides a familiar setting for the game player and audience. Capitalizing on similar experiences, that EduBrew is geared towards those who have an affinity for beverages such that they are inspired to craft their own, lens 13 provides the backing of inspiration and motivation for EduBrew's development.

2. Lens #14: The Lens of the Problem Statement

EduBrew examined several elements of the beer making process and identified challenges (problem) at three different stages of development. These problems are

a key aspect of game design allowing the player to meet the objective of the game. Schell' describes this as a crucial element. It is important to get the problem statement right—if you make it too broad, you might come up with designs that don't meet the true goal, and if the problem is too narrow, then clever solutions might never come about, limiting the game experience (Schell, 2015).

3. Lens #17: The Lens of the Toy

While the audience of EduBrew is for the inspiring beer brewing enthusiast, the game itself is created in such a way that allows for the aspect of fun regardless of brewing knowledge. While educational components are built to help guide, inform and educate the proper synthesis of new beers, the low risk environment allows for the common lay person to pick up and play requiring only their creativity to keep them engaged. EduBrew allows this creativity to build for the most serious contender to the general player who simply just wants to mix it up, “Bacon-fied Brew, anyone?” Therefore opening the game play to a variety of audiences with limited expectations allows for the player to experience fun without the risk of not completing any goals. Schell, highlights the importance of this lens, called the lens of the toy, by stating “If my game had no goal, would it be fun at all” (Schell, 2015)?

4. Lens #32: The Lens of Goals

EduBrew focuses on six goals, from identification of different kinds of beer, ingredients, and equipment to learning the process of beer making through

defining different chemical reactions. These goals will help drive the players participation through the game and gives players a reason to care (Schell, 2015).

5. Lens #39: The Lens of Meaningful Choices

When we make meaningful choices, it lets us feel like the things we do matter, (Schell, 2015). Throughout EduBrew players encounter an endless number of choices, from ingredients to use, to equipment and finally how to name and market their product. Ultimately, the game play will need to leverage the number of choices with the players interest in the overall outcome. Providing too many choices without guidance and help could deter a player from finishing. Therefore, it is important to remember Schell's questions from lens #39 when creating these choices is the player given too many, too few or just the right number of choices. By incorporating more choices into the game would the player feel more powerful. Or would less choices make the game clearer (Schell, 2015)?

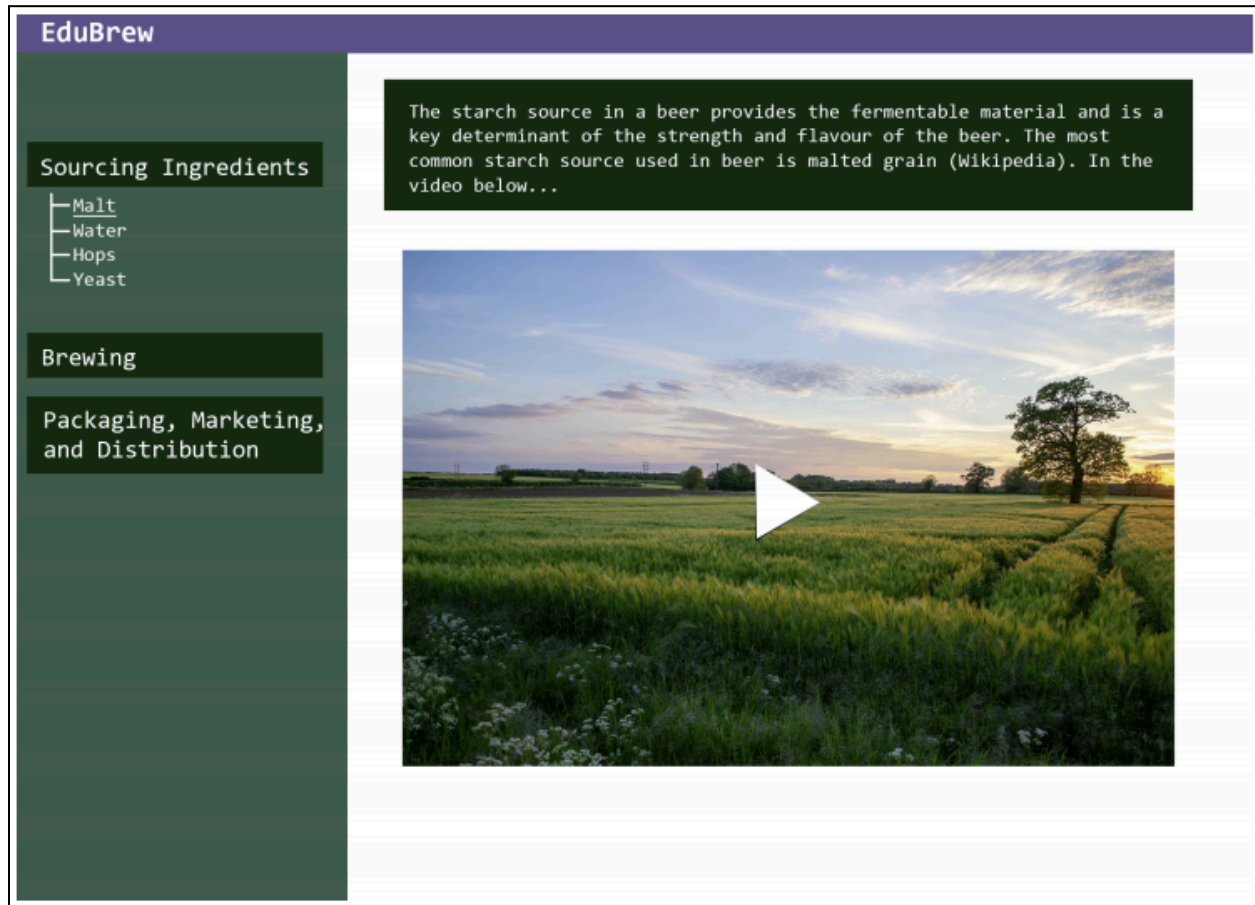
Evaluation Plan

In EduBrew, players learn by doing; throughout the three phases of sourcing ingredients, brewing, and marketing/distributing the production, the players learn necessary skills and then implement them to continue to the next step to complete the ultimate goal: found and run a successful brewery in the virtual world of EduBrew. Players can integrate their new skills in a way that is meaningful, as "application leads to reflective expertise and, consequently, to increased transfer performance" (Merriënboer, 1997, p. 73).

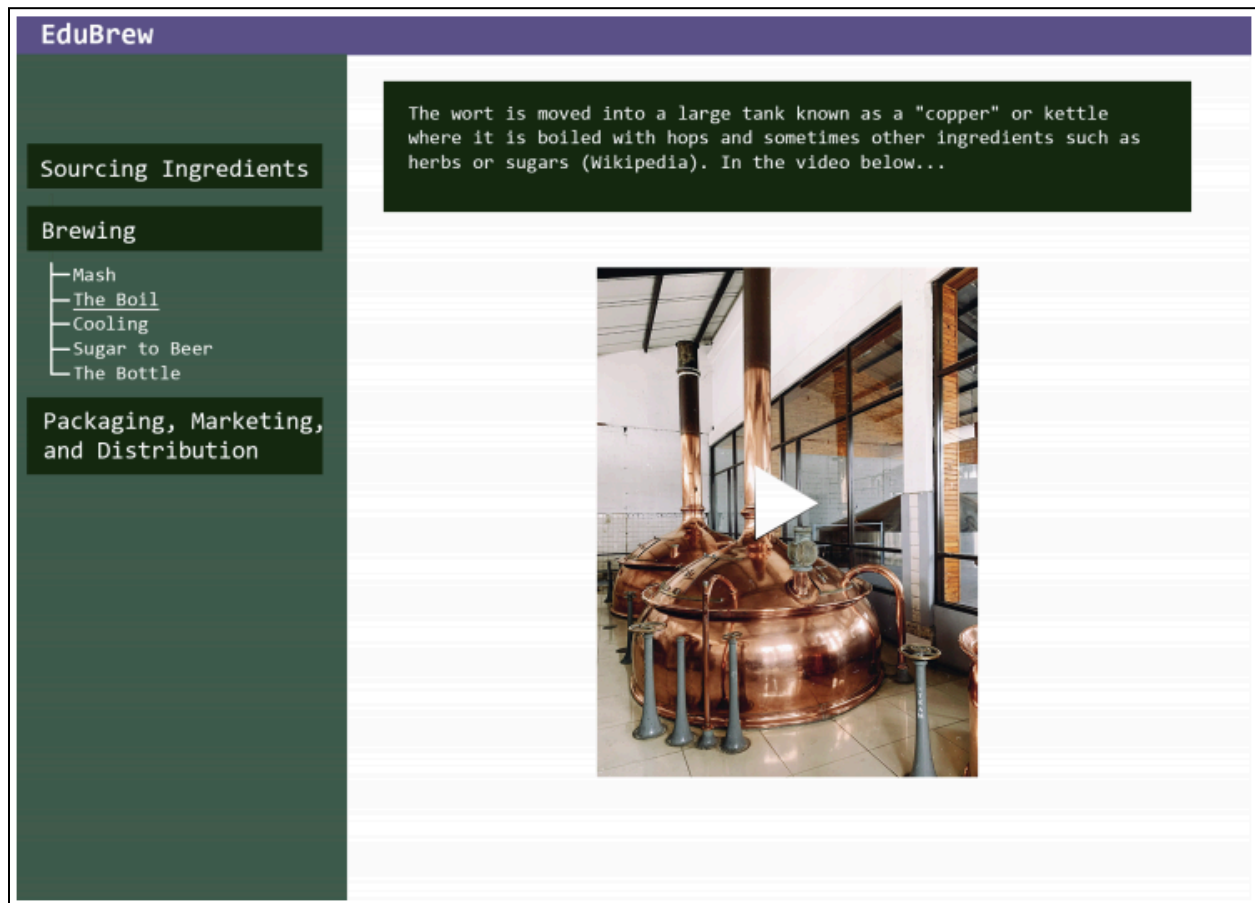
As shown in Figure 1, Figure 2, and Figure 3, the left side of the game acts as a progress bar for the players. There are three main phases: Sourcing ingredients, Brewing, and Packaging, Marketing, and Distribution. Within each phase, the players must complete certain actions to

understand the importance of each stage, to learn how to effectively complete these actions, and ultimately how to integrate them seamlessly to grow their brewery's brand awareness and make a profit. Table 3 highlights the game phases and the tasks the player will work through to prove their comprehension.

To evaluate performance and assess if learning goals are met, players will be able to earn and badges that show their brewing and professional achievements. The badges will appear in the "Achievements" tab of the game and will directly relate to the learning outcomes and goals we defined while designing EduBrew. Because these badges and the descriptions of the goal the player must complete will be listed for the player, they will feel motivated to explore the brewing process, and discover what makes a successful brewery. Table 4 shows a sampling of badges players can earn during their game play.

Figure 1*Sourcing Ingredients Screen*

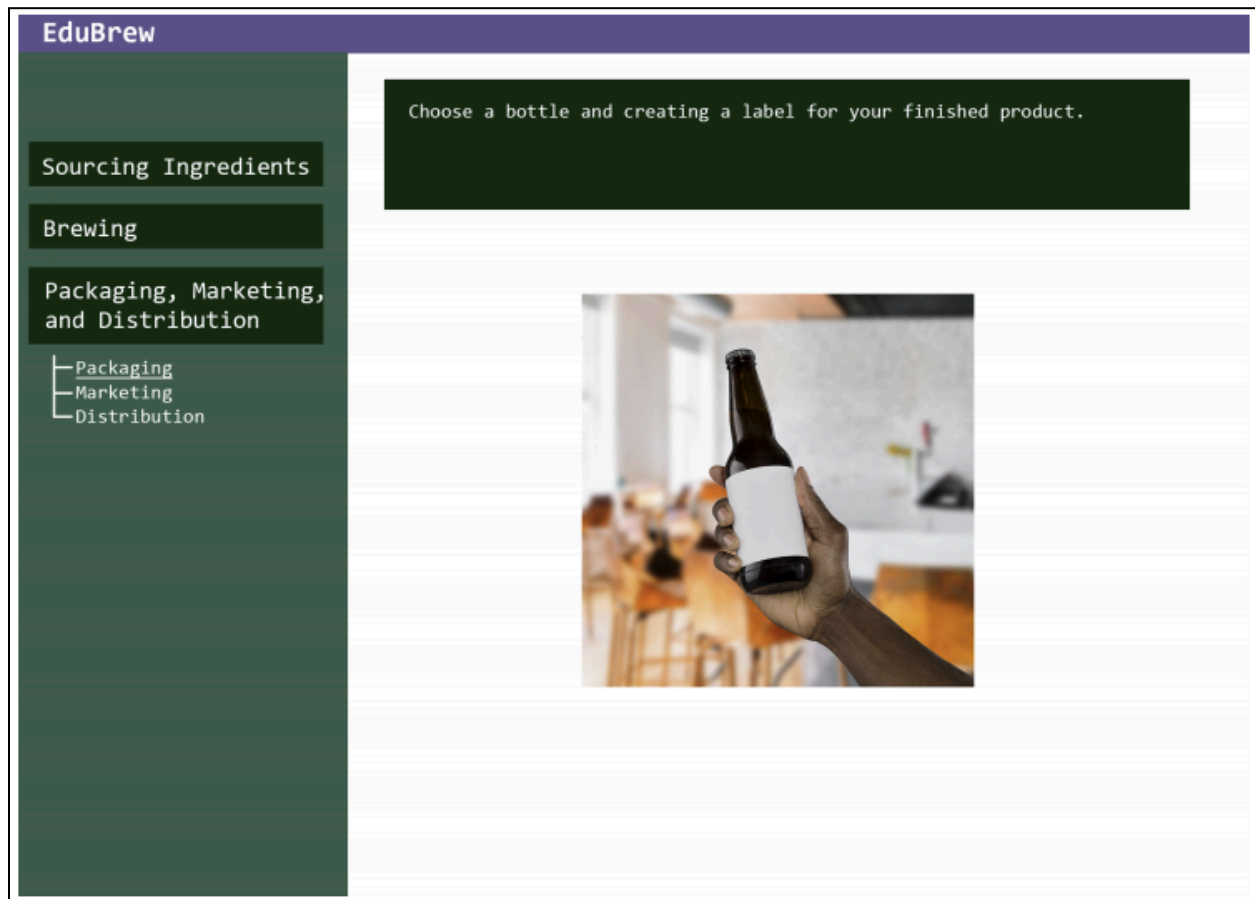
Note. This figure shows a mock-up of the Sourcing Ingredients screen where the player would learn about the main ingredients used to brew beer and how they are produced and prepared for brewing.

Figure 2*Brewing Screen*

Note. This figure shows a mock-up of the Brewing screen where the player would learn about the five main steps in brewing beer - mash, boil, cooling, sugar to beer, and bottling.

Figure 3

Packaging, Marketing, and Distribution Screen














Note. This figure shows a mock-up of the Packaging, Marketing, and Distribution screen where the player would learn the basics of packaging their beer and marketing it for distribution and sale.

Table 3*EduBrew Game Phases and Goals*

Sourcing Ingredients	Brewing	Packaging, Marketing, and Distribution
Watch video on how to select the best INGREDIENT X for brewing	Brew a porter (stout, pilsner, IPA, etc.).	Make a logo!
Working with a local farmer to source INGREDIENT X	Brew a beer with coffee (fruit, caramel, chocolate, etc.).	Market your first bottled/canned beer
Correctly identify 10 ingredients	Create 5 original brewing recipes	Sell your first beer at the farmer's market
Purchase ingredients for under \$X	Brew your first beer!	Develop your first partnership with a restaurant
		Develop your first partnership with a regional grocery store

Note. EduBrew game phases are listed across the top of the table, in the order that they are experienced in the game. Players will be asked to complete a variety of tasks within each phase, including those listed in the column below each phase name.

Table 4*Samples of EduBrew Game Badges*

Sourcing Ingredients	
Watch video on how to select the best INGREDIENT X for brewing	
Working with a local farmer to source INGREDIENT X	
Correctly identify 10 ingredients	
Purchase ingredients for under \$X	✓
Brewing	
Brew a porter (stout, pilsner, IPA, etc).	✓
Brew a beer with coffee (fruit, caramel, chocolate, etc).	
Create 5 original brewing recipes	
Brew your first beer!	
Packaging, Marketing, and Distribution	
Make a logo!	
Market your first bottled/canned beer	
Sell your first beer at the farmer's market	
Develop your first partnership with a restaurant	
Develop your first partnership with a regional grocery store	

Conclusion

In conclusion, EduBrew is a powerful learning game that allows players to truly experience the process of creating, marketing, and distributing beer. This game is authentic and meaningful as it incorporates the various lenses described by Schell in his book *The Art of Game Design: A book of lenses*. From sourcing ingredients to packaging a final product, EduBrew continuously engages learners through the careful implementation of motivational tactics and strategies throughout the game. EduBrew is challenging, goal-centered, driven by player choice, and designed for player creativity. These vital elements will keep our players both motivated and excited for continuous learning. EduBrew encompasses the necessary components of a successful game-based instructional design.

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