TAMPERE UNIVERSITY
OF APPLIED SCIENCES

Gamified Learning of a Game Engine

Frozenbyte's Editor Training Program

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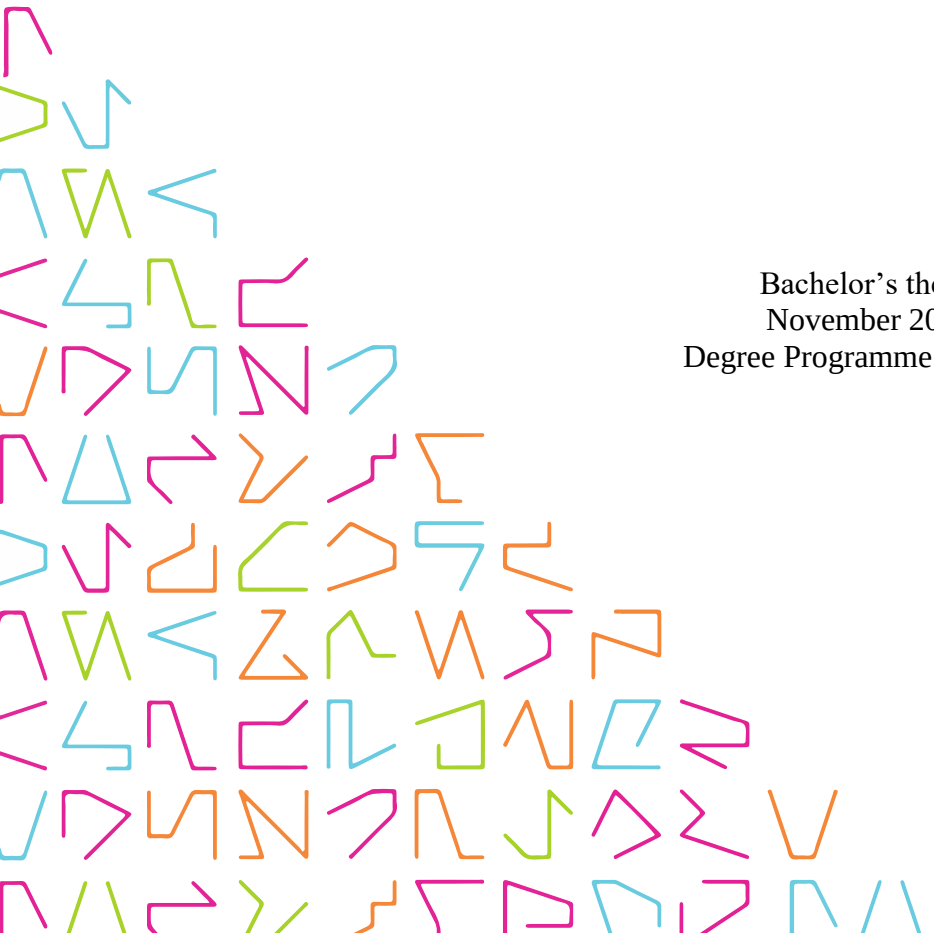

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ABSTRACT

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Gamified learning of a Game Engine
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This thesis was done while working at the game company Frozenbyte. As one of the oldest game companies in Finland, Frozenbyte has developed their own in-house game engine. This engine is used in all of their projects, but it is lacking proper documentation for employee training. To fix this problem they aim to gamify their editor learning process through Editor Training Program.

The main purpose of this thesis work was to analyze the existing Editor Training Program content of Frozenbyte engine to pinpoint the possible problem areas and present a solution for those issues. The secondary purpose of this thesis was to work as an example case on how to analyze content that needs to be gamified and which things should be taken into consideration while designing that gamification.

The content analysis was started by defining what gamification is and what are the best practices for it. This was done by considering various studies and meta-studies of the subject. With the best practices established, a definition of gamification that Karl M. Kapp (2012) presents in his book "Gamification of learning and instruction: game-based methods and strategies for training and education" was used to divide the Editor Training Program content into elements that would be easier to analyze. In addition to the theoretical analysis, a small questionnaire was conducted among the new level artists about the user experience of the Editor Training Program tutorials and the writer herself recapped her own initial experiences with the editor tutorials.

Based on the analysis results the aim of the practical work was about making the tutorial experience more streamlined for the user. This was done by designing a solution that had better means of displaying the task information for the user and visualizing the progression tracking. Further improvement suggestions about including preferred learning methods into the tutorial progress and motivating the secondary target group, the player community, into participating in learning and content creation was also presented.
This thesis managed to pinpoint some of the problem areas of the Editor Training Program tutorials and present possible solutions for them. The thesis defines gamification and uses that in analysis to pinpoint the strengths and weaknesses of the tutorials. The results are then used in the practical design progress, while considering the main target group of new employees. This way the thesis successfully works as an example on how gamification could be used for software learning and how it can be implemented in a smaller scale project.

Key words: gamification, software learning, game engine

CONTENTS

GLOSSARY

TAMK	Tampere University of Applied Sciences
cr	credit
User	User of an App or Game
UI	User Interface
GUI	Game User Interface
AI	Artificial Intelligence
App	Application
Unity	Unity Engine (a game engine)
MMO	Massively Multiplayer Online (game)
UE4	Unreal Engine 4 (a game engine)

1 INTRODUCTION

The aim of this thesis is to explain what gamification is and how to implement it into a project through analysis of existing content.

This thesis was written while working with the Helsinki based game company Frozenbyte and it is done more specifically for their Editor Training Program. The aim of the Editor Training Program is to gamify the learning process of Frozenbyte's in-house game engine and editor for the new employees and players alike. The aim of this thesis work is to analyze their existing gamified editor tutorial content and present a solution tailored to tackle the existing problems and to support further learning.

In this thesis, the concept of gamification is explained. This will be used as a reference for analysis of the existing gamified editor tutorials to pinpoint possible issues. Additionally, a user experience questionnaire was conducted and the answers from four new employees that were using the gamified editor tutorials to accustom themselves with the Frozenbyte engine are used as a part of the analysis. The results work as the base for the design document which is the practical part of this thesis. The objective and the outcome of this thesis is not a finished and streamlined product. The goal is to analyze the gamified editor tutorials and, considering the results, produce a design document of a solution that is most useful for improving Frozenbyte's Editor Training Program tutorials.

A successful thesis will prove to be useful for Frozenbyte in different ways. Good implementation of the tutorial project makes it easier to train new level artists that are new to the editor and thus makes their integration to the company more fluent. In a point of view of the players it also makes the games last longer, since fans learn to use the editor and make their own levels to share via Steam service. The project might also potentially result in better job applicants in the future since motivated fans know the engine from before.

This thesis will also potentially help people to understand gamification and its various means of implementation. Designers need to understand the strengths and weaknesses of gamification as well as their own product, before implementing game-like features blindly. The aim of this thesis is to analyze the strengths of the current product and how to use gamification elements accordingly to enhance it. Potentially this thesis will serve as a good example of a pipeline for gamification needs analysis and implementation.

2 An introduction of the thesis concepts

2.1 About the concepts

Before getting into the analysis it is important to understand the core concepts of the thesis. This section is about the concept of games, engines, tutorials and gamification.

2.1.1 Definition of a video game

The name “video game” refers to an electronic game that is played via input device and a screen. This can be a television or a computer screen. The name itself is a remnant of the early technology and today video games are played with many different devices and platforms varying from traditional pc to consoles and mobile devices. (Wikipedia, Video game, 2001.) In this context, a game is a three-dimensional or two-dimensional world where the player controls a character or a vehicle while engaging in various kinds of challenges. (Gregory, J. 2014. 8-9.)

2.1.2 Definition of a game tutorial

A tutorial is made to relay information through example to the player. It is an interactive learning experience that often uses text prompts or voice-over that will help the player to learn the game mechanics and tell them about the game world. For example, how to move around inside the game or how to use items. A tutorial can be an independent level or it can be tied to the story and integrated into the actual game. (Rouse, R. 2005. 128-131.)

2.1.3 Definition of a game engine and editor

A game engine is a software framework that is a combination of different functionalities that the developers need to create the game. Most common features are, for example, a renderer which enables the use of 2D or 3D graphics, a physics engine that calculates and detects possible collisions or a support for scripting. With this kind of core component set, it is easy for the developers to create games with different art styles and rule sets without making any big modifications on the underlying core components. In short, a game engine is a software that can be extended and built upon based on the needs of the

game project in question. Many developers today have licensed their own engines. (Gregory, J. 2014. 11-12.) There are several different engines in the markets that use different programming languages, some are more fit to 2D, some for 3D. There are also engines specifically for certain platform development, like mobile or pc or they can be specifically for a certain genre like MMO or FPS. (Wikipedia, List of game engines. 2005.) For example, Epic Games licensed engine "Unreal Engine 4" (PICTURE 1) is very popular commercial engine that offers free personal license. (Unreal Engine, What is unreal engine 4)

PICTURE 1. Unreal 4 offers complete development packages. (https://www.unrealengine.com 2017)

2.1.4 Definition of gamification

In his book "Gamify: How gamification motivates people to do extraordinary things" Brian Burke talks about how the term of "gamification" was first introduced to the world 2002 by Nick Pelling. The term didn't get any widespread attention until 2010 and in 2011 it was a runner up for the "word of the year" of Oxford Dictionary. While there is not only one definition to the concept of gamification, the most common one describes that gamification is when game-like elements or systems are applied to a product or a service to engage users and motivate them to achieve their goals. (Burke, B. 2014. 6-7.) The increase of smartphones, fast internet connections and social networks have affected to the rise of the gamification significantly (Kim B. 2015. 29-35.). One of the earliest examples of gamification on smartphones is "Foursquare" that launched 2009. The app is location based and it rewards the users with points and badges for checking in different

locations, such as restaurants or airports. In addition to traditional leaderboards and award badges for checking in many days in a row, Foursquare awards the most active users with “Mayorships” of their most frequented locations. This way the app creates goals for the user and motivates them by the means of competition and social approval to achieve the goals. (Burke, B. 2014. 6.)

3 An Introduction of the Methods

3.1 About Methods

In the following section, the methods that were chosen for the thesis analysis part are presented. It will also be explained how they are going to be used to gather information for the practical implementation part of the thesis.

3.2 The Theoretical starting point of Gamification

As for one theoretical starting point, the goal is to do research on gamification. The aim is to try to establish what are the good practices and approaches to designing gamification. The main source used in this thesis work are the publications of the Bloomsburg university professor Karl M. Kapp.

To further understand the concept of gamification one needs to understand the core elements of "a game". In his book "Gamification of Learning and Instruction" Karl Kapp states the following "A Game is a system in which players engage in an abstract challenge, defined by rulers, interactivity, and feedback, that results in a quantifiable outcome often eliciting an emotional reaction." (Kapp 2012, 7). With this he breaks a game into a list of following elements: System, Players, Abstract, Challenge, Rules, Interactivity, Feedback, Quantifiable outcome and Emotional reaction. So, in other words a game is these elements combined in an elaborate system that works under certain rules providing abstract challenge and feedback to the player engaging the system with the goal of achieving quantifiable outcome and emotional reaction.

Understanding the difference is the key and before going into what gamification really is, it is necessary to establish what it is not. Although it is not a new concept by any means, there is still a great deal of misconceptions about gamification. Gamification is not about pasting mechanics, such as badges, points and rewards, that are seen game-like onto an existing solutions or content. It does not fit into every situation and it is not an easy task to create well-functioning gamified systems. (Kapp 2012, 12-15.) Also, gamification is not the same thing as a learning game or a simulation. Learning game is one entity made to teach a specific thing and it is presented in a linear manner. Simulation is about creating

as realistic circumstances as possible to train certain skills, such as flying or driving. (YouTube, What is Gamification? A Few Ideas. 2014.)

Karl Kapp ends up describing gamification as the following: “Gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems.” (Kapp 2012, 10).

So, Gamification is a game-based concept which uses game-like means to engage the player and support the learning or enhance motivation of certain things. Kapp also divides gamification into two major categories which are “structural gamification” and “content gamification”. Structural gamification means that game-like structure is used to present certain content, while content gamification is when you add game elements to make content more interesting. (YouTube, What is Gamification? A Few Ideas. 2014.)

Based on Kapp’s previous description of gamification, he divides it into several elements: Game-based, mechanics, aesthetics, game thinking, engage, people, motivate action, promote learning and solve problems. These elements are going to work as the base of gamification analysis for this thesis. Next the elements are explained more in detail.

Game-based: Gamification is about creating a system or an environment that works like a game, providing challenge to the player with a certain rule set and measurable outcome. Goal is a motivating and stimulating environment for the user.

Game mechanics: Gamification uses different elements inside the created system which are commonly used in games. These include, but are not limited to: Player skill levels, experience points, achievements, health points, in-game currency and time constraints.

Game aesthetics: Gamification uses elements that give the impression of a game, for example via UI design. Aesthetics affect how the information is visually conveyed to the player and how they react to their environment.

Game-thinking: Gamification is most of all about game-thinking. How to transform an activity or a system into a game like experience to the user via using the mechanics and aesthetics.

Engage: Gamification aims to gain the players attention and concentration to the tasks at hand.

People: Gamification requires a party that is being motivated to engage in the system. These can be of various demographics, for example, students, consumers, employees, joggers or players.

Motivate Action: Gamification always aims to motivate the player into engaging action and activity.

Promote learning: Gamification can promote learning. Techniques used by gamification are same ones that have been used in classrooms for ages. Techniques like scoring the users performance, giving constant feedback or encouraging the user in cooperative action or competitive action.

Solve problems: Gamification can offer tools and motivation to problem solving. Individually or cooperatively.
(Kapp 2012, 10- 12).

Next these previous points are used for the basis of example analysis of gamified application Duolingo and see how they apply in the gamified solution in question.

3.2.1 Analysis of Gamification: Duolingo

A noteworthy example of structural gamification is the language learning app “Duolingo” that launched in November 2011 (PICTURE 2). The company's manifesto emphasizes that they aim to personalize the learning experience to the needs of everyone, while making it also fun and accessible. There are over 120 million people learning languages via Duolingo and on 2005 they also launched platform for the public schools in US. (Duolingo, About us.) (Wikipedia, Duolingo)

PICTURE 2. Duolingo logo (Duolingo press-kit 2017)

The application offers a wide variety of languages to choose from and it uses gamified lessons to motivate the user. Each lesson has elements of listening, reading and speaking. It gives the user straight feedback on the progress while playing, as well as displays how many days in a row the user has engaged in the lessons. (Duolingo, Duolingo.com)

When analyzing this through Kapp's elements we get the following:

Game-based: Player can use Duolingo's service via phone or browser. The lessons are presented in a game-like manner and the user must complete certain lessons before they can proceed to the next level of studies. The user earns experience points and in-game currency when completing lessons. Duolingo provides a game like structure to the user for taking lessons in languages, thus being a classic example of structural gamification.

Game mechanics: Duolingo uses several game mechanics. Lessons are themed small entities and they are divided into "checkpoints", which the user must achieve to proceed to new themes. The user gets experience points towards the set daily goal when completing lessons and checkpoints. After each completed theme the user earns in-game currency called "lingots". Lingots can be spent on power ups, such as "Streak freeze" which allows the user to skip one day without breaking the learning streak or "Double or Nothing" which lets the user wager 5 lingots towards maintaining a seven-day streak of learning.

Game aesthetics: Duolingo's UI is made so that it presents the progress clearly and it is easy to understand. The themed lessons are visualized with small icons and progress of each lesson can be seen on side of that icon. The progress of individual theme can also be seen during the lessons. The ongoing streak of days and lingots count are also visualized to the user in a game like manner.

Game-thinking: Duolingo motivates the player to practice every day via mechanics and friendly competition and with a progression that can be seen clearly. The app itself is easy to pick up and start learning, since the lessons are divided into small enough modules for optimal pacing for receiving new information.

Engage: Duolingo encourages the user to practice every day and tracks on how many consecutive days the user has achieved the daily goal. User can also see their friends current score and compete against them.

People: The target users are a wide range of people who want to learn languages.

Motivate Action: Language clubs, friendly competition, challenges and pop-up reminders motivate the user to pick up the app daily.

Promote learning: Duolingo promotes learning with many techniques. Progression feedback during lessons, checkpoint progression, in-game currency prizes and corrective feedback when user makes a mistake. The user can also set up language learning clubs for group learning or they can compete against a friend who gets more consecutive days in a row.

Solve problems: Duolingo takes the complicated subject of learning languages and presents it in an easy and fun form for the user.

3.2.2 Analysis of Gamification: Software Learning

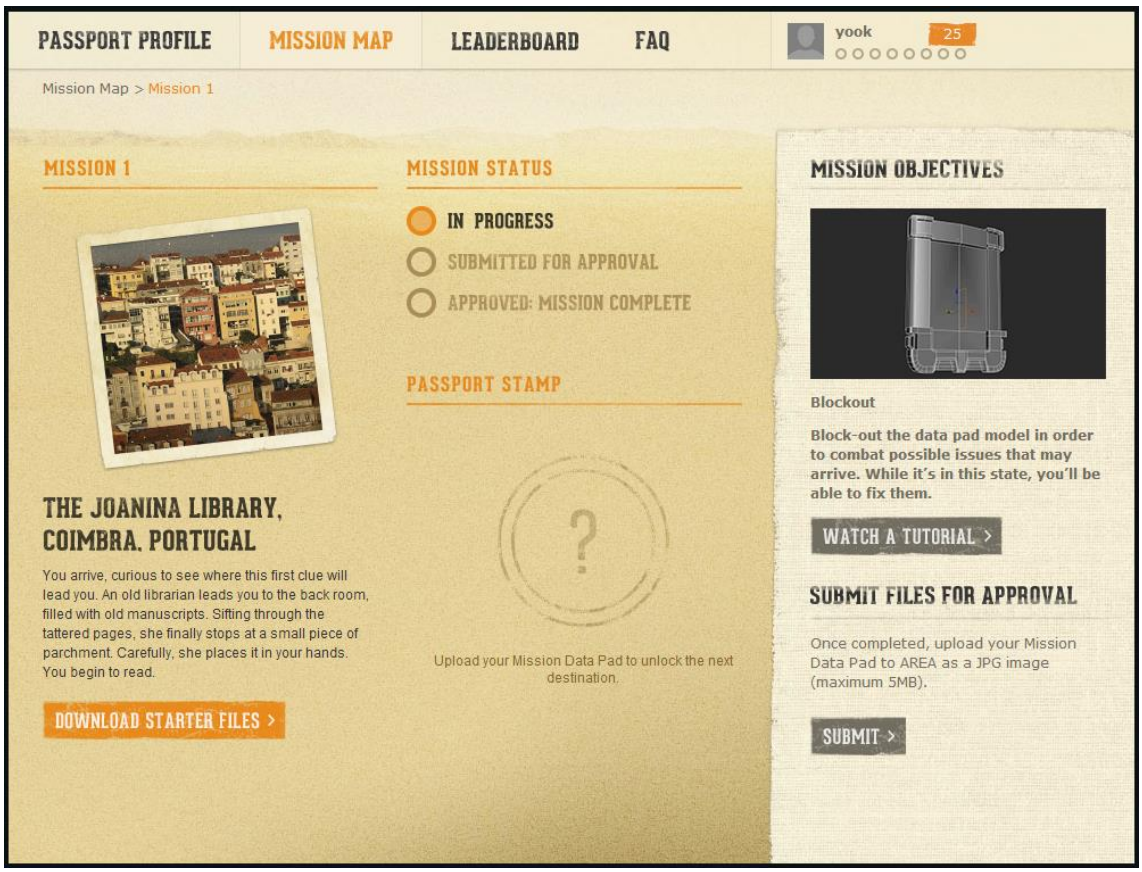
The previously mentioned Duolingo is a good example of gamification done right. This thesis however is about gamification of software learning process. There have been several examples of this field in the media industry and some of them have been successes while some of them have not. For example, Microsoft Office Labs developed a game for office versions 2007 and 2010 called “Ribbon Hero” to teach the consumers how to use Microsoft office products (Wikipedia, Ribbon Hero). They further developed the game by adding storyline to the sequel called Ribbon Hero 2: Clippy’s Second chance. (Wikipedia, Ribbon Hero 2)

In 2011 Adobe experimented with a solution called “LevelUp for Photoshop” and their goal was to convert trial users into paying customers by teaching the trial users how to use their product via gamification. They provided the trial users with different tasks that would result into points, badges and a chance to win Adobe CS5 Master Collection. (Bunchball, LevelUp for Photoshop - Gamification of Learning Complex Software). The add-on was discontinued in 2014 since although it did successfully teach the users how to use photoshop, it did not result into increase of paying customers. (Enterprise Gamification, Adobe Photoshop Gamification).

Similar and particularly successful case of gamification was Autodesk’s “Undiscovered Territory” gamification pilot project (PICTURE 3.) which was done for Autodesk’s 3D modelling software 3DsMax. Their goal was the same as Adobe’s and they aimed to convert trial users into paying customers by engaging them into learning and using the software during the trial period. (Wolfe, D. & Burke, S. 2013. Converting Free Users to Paid: Gamification at Autodesk.)

PICTURE 3. Undiscovered Territory Logo (http://www.gamification.co 2013)

They introduced the gamified solution to 3DsMax trial users in 2012. It came with the 30-day trial version of the software and it was run as a competition where the participants could win Autodesk Entertainment Creation Suite. The game was divided into eight chapters of which consisted of different design tasks that user had to complete and submit to proceed in the game. (PICTURE 4.) This would make the user gain points and progress in the storyline. (Openlm, Autodesk’s “Undiscovered Territory” game to boost training of 3DsMax.)



PICTURE 4. Mission view. (Screenshot: Ori Kaplan, OpenLM.com 2012)

The game and competition was seen as a success and according to the statistics it resulted into 54% increase in trial users and 15% increase in buy clicks. In addition to this the solution received media attention and won two awards. (Wolfe, D. & Burke, S. 2013. Converting Free Users to Paid: Gamification at Autodesk.)

When analyzing "Undiscovered Territory" through Kapp's elements we get the following:

Game-based: The game was accessed through 3DsMax and the content of the game was divided into levels in which the trial users uncovered the story and gained points by submitting task in different story locations. This progress was presented in a game like manner on a map. There was also a competition element with leaderboards and prices.

Game mechanics: Levels, tasks, points, storyline and a leaderboard.

Game aesthetics: The game window for Undiscovered Territory had tabs for player profile presenting the leaderboards and points. It also had mission map showing the progress

of the story and current tasks. The submitted tasks earned the trial user a passport stamp to mark the completion of the task and level location. The solution used game-like aesthetics to visualize the story progress, task completion and gained points for the player.

Game-thinking: Undiscovered Territory made it easier for the trial users to start learning the very basics of the complicated 3D program. The storyline made the experience more engaging and fun. The competition aspect with leaderboards motivated trial users into active participation. This in turn made the trial user return to the software again and again. Autodesk believed this would increase the odds that the trial user would become a paying customer.

Engage: The gradually revealed storyline that was designed to engage the trial user. The active leaderboards also provided extra engagement for the competition oriented users.

People: The target group was special Effects artist and Game developers who user 3DsMax in their field of work. Creative industry professionals.

Motivate Action: The game and the storyline provided the trial users motivation by making the learning experience interesting and fun. The competition aspect and the expensive Creation Suite price provided additional motivations.

Promote learning: This was done by providing starter files, documentation, video tutorials and feedback after submitting the file. Trial users were also encouraged to competitive action by providing public leaderboards with scores. The Autodesk forums also had active threads about the game.

Solve problems: Undiscovered Territory aimed to find a solution on how to convince the trial users to take the final step of purchasing the expensive product. This was done by making the learning process of initial skills as easy and fun as possible.

Based on the statistics and results “Undiscovered Territory” is a good example of gamification solution where good gamification design met the correct target group and it managed to achieve the goals that were set for the pilot project.

3.2.3 Does Gamification work?

After defining what gamification is and what it aims to achieve, it is necessary to ask how effective it really is. There have been several peer-reviewed studies done about this subject that can be referenced.

In his book Karl M. Kapp (2012) approaches the subject by looking into meta-analysis studies. Meta-analysis is a study of studies where researchers collect and combine data from several other studies into statistics to find common nominators. The aim of Kapp's brief study of studies was to find support to the claim that gamification can be an efficient tool and a positive influence in learning. The study consisted of six different meta-analysis studies that considered several different individual studies on gamification and its effects in learning. Most of the studies showed better results with gamified learning, but even though there are successful cases of gamification for variety of subjects and target groups, one cannot assume that gamification works in every situation and for every user. The best results were achieved when the gamification was designed to target specific subjects and the goals of the game were defined for the player in a coherent and clear manner.

One of the studies Kapp references was Fengfeng Ke's Meta-analysis "A qualitative meta-analysis of computer games as learning tools" and the results state that "Instructional support features are necessary part of instructional computer games and when support is present the studies indicate significant results" (Kapp, 2012. 84). Meaning that the player should have clear instructions all the time, since without instructions the player concentrates on learning how the gamified solution itself is played, while the actual knowledge content may get lost in the progress. This same issue is referenced in the results of a study by Robert T. Hays stating, "Instructional support to help learners understand how to use the game increases the instructional effectiveness of the gaming experience by allowing learners to focus on the instructional information rather than the requirements of the game." (Kapp, 2012. 81).

Among other findings were that gamified solutions also seemed to result into better attitudes towards learning amongst the users than traditional approaches and that the solutions themselves did not need to be fun or entertaining to be effective learning tools.

These studies showed that with proper design and instructional guidelines the gamified approach can provide positive learning experiences and motivational boosts for the player. (Kapp 2012, 75 – 103.)

Much like Kapp in his study, Hamari, Koivisto and Sarsa (2014) study the peer-reviewed studies with the research question "Does Gamification work?". They looked into twenty-four studies of gamification of different subjects that used either qualitative and quantitative approaches or both. The studies also measured either psychological effects or behavioral effects of the player. The results were mostly positive, but some negative aspects were also found. In the field of education and learning most results on psychological effects, such as motivation, engagement and attitude were positive, but negative aspects like increased competitive environment and the difficulty of task evaluation were brought up.

Overall the studies suggest that gamification does work and it can have beneficial effects on learning, but it has its limitations. The study also suggests topics that should be considered in the future, such as the context of the content that has been gamified, since different subjects have different needs when designing the gamification. This also goes for the intended target groups of gamified solutions that have varying motivational factors. (Hamari, Koivisto, Sarsa 2014, 3025-3034.)

In conclusion, it can be said that gamification has its shortcomings and aspects that should be further studied to pinpoint the very best practices, but it has proven to be effective tool in learning when it is designed and used to fulfil a specific purpose. It does not work in every situation or with every target group and those should be considered while designing the possible implementation.

3.2.4 Good Practices for Gamification

After establishing that gamification can be an effective tool, one should consider the best practices for it. Like with many other things there is good practices and bad practices for gamification. In the eBook "Gamification redefined – The right and wrong strategies" Cao, Nouvel and Ellis (2015) list some of the good practices that should be considered when designing gamification. They write about that one, while guiding the player, should always try to make the user feel smarter. The designer should try to avoid patronizing the

user as well as think about the flow of things and how to avoid interruptions that would break the immersion of the user. Also, very important thing to keep in mind is that one should not force the concept of fun, since gamification cannot create fun if there is none in the initial product. (Cao, J & Nouvel, S. & Ellis, M. 2015. 15--17.)

After all gamification is not necessary about creating "fun" in the first place, since the implementations of it as a learning tool can be effective even without being entertaining. Support for this was found in Sitzmann's meta-analysis. (Kapp, 2012. 87.)

The issue of flow and user immersion are also something Kapp (2012) mentions in his book when writing about "Theories Behind Gamification of Learning and Instruction". The theory of flow according to Hungarian psychologist Mihaly Csikszentmihalyi is an optimal state where the user is fully immersed and concentrated to the task at hand, often this includes losing the sense of time while engaged in the activity. To achieve this state the designers should try to provide the user with a task that is suitable to their skill level, without being too easy or too challenging with proper tools and active feedback to achieve the goals they are given. This effect is very desirable when designing a traditional game, though it rarely happens in learning games, it still is a good thing to aim at while designing the gamified solution. (Kapp, 2012. 71-73.)

In other words, while designing gamification it should be considered what might be distracting to the user and how to minimize those factors inside the solution into only what is necessary. How to balance the guidance and feedback given to the user so that it does not feel patronizing or leave the user confused and guessing how to proceed.

In their study "Disassembling Gamification: The Effects of Points and Meaning on User Motivation and Performance", Mekler, Brühlmann, Opwis and Tuch (2013) wanted to see how motivational factors that are often used in games would affect the overall user performance. The study participants were presented with a simple image tagging task, where they were to tag fifteen abstract images with corresponding moods. The initial control group was presented the task without any meaning or points system. The other groups were presented with the same task with points, with a meaning where the users were told that they are helping in a scientific study and in the end both motivators (the points and the helping aspect) were in place. (Mekler et al. 2013, 1139.)

The results showed that when given the reason of helping in a scientific study, the participants felt that the task was more valuable and important. It also improved the quality of the tags. Adding the points made the participants tag pictures more quickly. This resulted into a higher quantity of tagged pictures. The best result was achieved through both factors in place while the initial control group lacking the two factors maintained the lowest performance of all the groups. (Mekler et al. 2013, 1139 - 1141.)

Even though the study was purely about the two motivational factors of points calculation and giving meaning to the task, it shows how gamification mechanics work best when used together. There are numerous different factors that one could further study, for example social factors like leaderboards, but the study manages to give some answers about the importance of meaning and visual feedback to the user. It also points out that different mechanics motivate users to produce different results. When given reason for the task it resulted into tag quality, when given just points it resulted into tag quantity.

Kapp also writes about the importance of motivation and what drives the user to engage in the tasks given. The terms Kapp uses are “Intrinsic Motivation” and “Extrinsic Motivation”. Motivation is intrinsic when the user does something just for the sake of doing. It is about the activity itself and the enjoyment and fulfillment it gives the user. Motivation is Extrinsic when there is an outside reason for the user to engage in the activity they would not otherwise engage in. These kinds of reasons can be for monetary rewards, social rewards or avoiding possible repercussions. (Kapp, 2012. 52-53.)

These points from Kapp’s book (2012) and Mekler’s study (2013) support the proposition that Hamari, Koivisto and Sarsa (2014) made in their meta-study results about further studying the context of the gamified content and the intended target groups and their individual motivational factors. Users own motivations, outside motivational factors and the motivational needs of the gamified solution should be considered while designing gamification.

In the article “Gamification: Design for Motivation” by Sebastian Deterding (2012), which is a collection of short writings by gamification experts on different fields, gamification’s possibilities and current problems are discussed. Many of the opinions expressed in the article are along the same lines with Kapp’s ideas about gamification. Deterding (2012) writes that most game designers dislike the concept of gamification. Since

it is seen as taking the small elements from games that are irrelevant by themselves and presenting them as “core experience” to the user. (Deterding 2012, 14.)

In his section of the same article “Gamification is not a Dirty Word”, Judd Antin from YAHOO! (2012) says that gamification is a positive trend, but it is not an answer to everything. He talks about how gamification principles work on rewards that are all about good feelings to the user and not only about material gain. He sees it as a one step forward when designers start to see that there are other motivations for the user than just money and gifts. He mentions a few examples of these non-material rewards that include group identification, social approval and self-efficacy. These things are not new concepts and Antin mentions The Boy Scouts of America and their badge system as an example. The badges create motivational value by creating goals, give out marks of mastery, reputation and work as signaling the identity. (Deterding 2012, 14 - 16.) These aforementioned rewards can provide both intrinsic and extrinsic motivations to the user.

Elizabeth Lawley (2012) from the Rochester Institute of Technology gives some input to the educational use of gamification. Many of the gamification implementations so far do not represent actual games and they may drive people away from the medium because of bad implementation. Good gamification requires proper game design. Thought should be put on the design of the product. Lawley mentions their own successful project “Just Press Play” where they gathered out the facts that they knew would help the students to perform and thought out mechanics to support those facts. The project was successful and now they are trying to expand their platform to other educational institutes as well. (Deterding 2012, 16 - 17.)

Rajat Paharia (2012) emphasizes that the product one aims to gamify, needs to have some value and appeal already. It is not possible to create appeal with gamification alone, but one can enhance the already existing one. Currently, there is plenty of copying going on without understanding the mechanics and reasons behind the design choices. One should always know the value of the product and build the gamification on that. (Deterding 2012, 17.)

The best practice for implementing gamification is to recognize the strengths and weaknesses of the product that needs to be gamified. It is also vital to keep in mind the purpose of the gamified product and the target group. Designer needs to consider what mechanics

will make one reach the desired effect in users and what exactly one wants to achieve with the gamification. This is achieved by knowing the product and the target group and their possible motivational factors that should be considered while making the design choices. Adding mechanics blindly without any purpose to just make the solution more game-like or trying to force the fun factor in the product is not a good approach to gamification design.

3.3 Questionnaire introduction

A Questionnaire is a series of questions that are used to collect data for research purposes (Wikipedia, Questionnaire. 2003). For the purposes of this thesis the questionnaire is used for mapping out user experience and usability inside the Frozenbyte engine and editor. The respondents for the questionnaire are new level artist employees with various backgrounds. The results of this questionnaire will be used as a comparison for the editor content analysis that is made with the Kapp's elements of gamification in mind.

4 An introduction to the practical work

4.1 About the practical implementation

This section will tell about the company that the thesis is primarily made with. There will also be an introduction about “The Editor Training Project” and the initial challenge of the gamification of the editor learning that this thesis work aims to find solutions for.

4.1.1 Frozenbyte ltd.

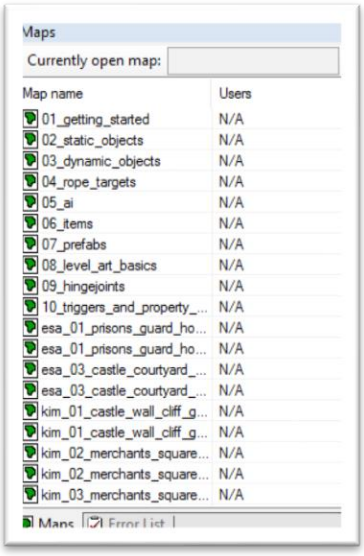
Frozenbyte is one of the oldest and biggest game companies in Finland. It is also highly independent company that has self-funded and self-published all its titles. The company was founded in 2001 in Helsinki and their first commercial title was the sci-fi top-down shooter “Shadowgrounds” for PC. Later the company got known for the “Trine”-series consisting of three games to this date. The company now employs over 70 people and has just released its latest stealth game title “Shadwen”. (Frozenbyte, frozenbyte.com.)

4.1.2 The editor training program

Over the years Frozenbyte has built their own custom engine and editor which they have used to make all their titles. Recently they started “The Editor Training Project” where the aim is to gamify the learning process of the editor for the new employees. This is to make the integration of new employees easier and faster.

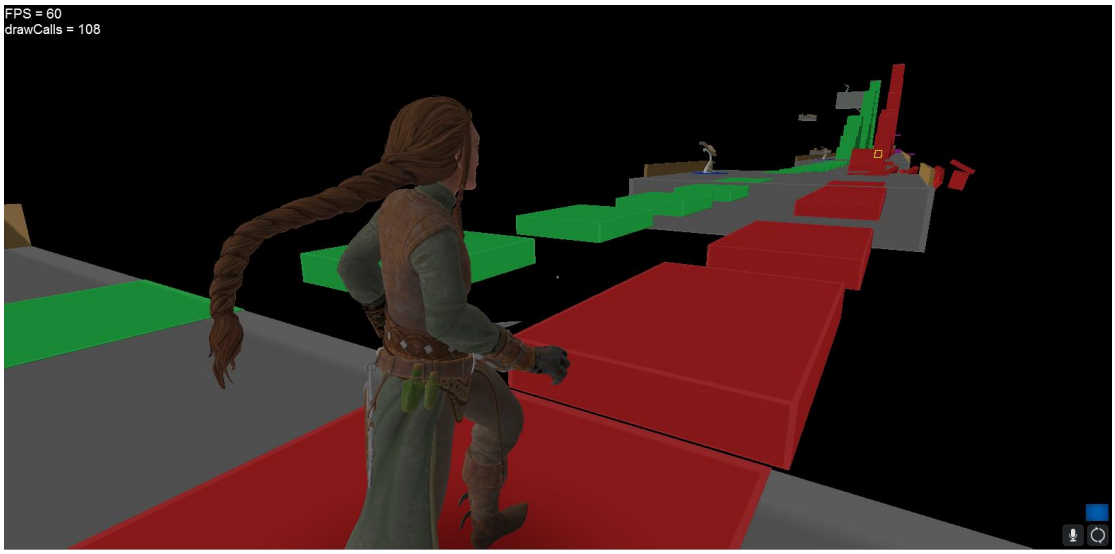
Right now, The Editor Training Project is a collection of levels that teach you the very basics of working with the “Shadwen” editor. They go through basic subjects such as: Static objects, dynamic objects, hinge joints, prefabs, level art and lighting. Frozenbyte’s plan is to cover all the editor functionalities over time and in the future, expand the project to cover programmers as well. Main target group for the project right now are the new and current employees. As a secondary group, the project will also serve the gamers who want to learn the editor which comes with every purchased Frozenbyte's game. Frozenbyte editor comes with the games Trine: Enchanted Edition, Trine 2, Trine 3 and Shad-

wen. The editor training program tutorial levels come with the editor. Once player purchases the game, they can choose to launch the editor when starting the game through their Steam library. After that they can choose from the previously mentioned tutorial levels the subject they want to study or they can view the actual levels from the game itself. (PICTURE 5). These are the levels attached to the Shadwen editor v4.00.



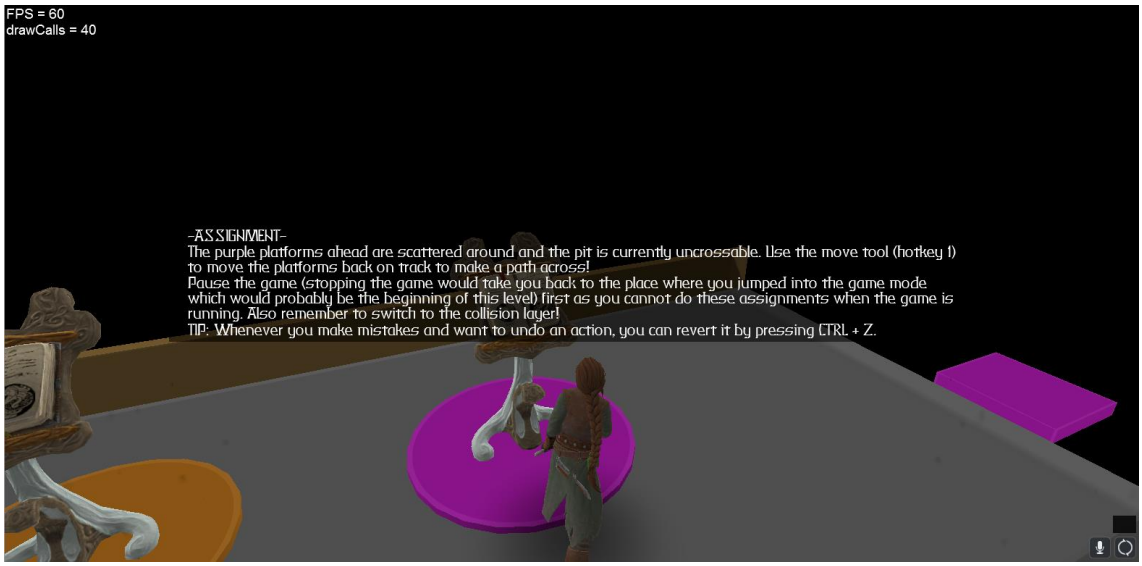
PICTURE 5. Shadwen editor level list.

The player moves inside the level just like in the game by running, jumping, climbing or using a rope ability. In Shadwen time only moves when the player moves and you can rewind time by pressing “r” on the keyboard. This key mechanic is not build for the tutorials directly, but it manages to make the trial and error approach more convenient in, for example, “04_rope_targets” which teaches the player how to build obstacle courses for the game (PICTURE 6).



PICTURE 6. Obstacle course.

The tutorial levels work in two different modes: “Play” mode, in which the player uses the character to move inside the level and “Editor” mode, which is the default mode of the editor when it first runs. “Play” mode is where player reads the tasks and “Editor” mode is for completing the tasks. For example, the player approaches a book actor in the level. The book actor activates and there is an assignment task for the player to build a way across (PICTURE 7). This means that the player must exit “Play” mode and do the modifications in the “Editor” mode. To test their modifications the player must enter “Play” mode again.



PICTURE 7. The assignment in “Play” mode.

The books inside the levels offer different kinds of information from good level design tips to technical setups and they are marked with corresponding colors. Blue books give advice on good level design, yellow books give editor instructions and magenta books are assignments.

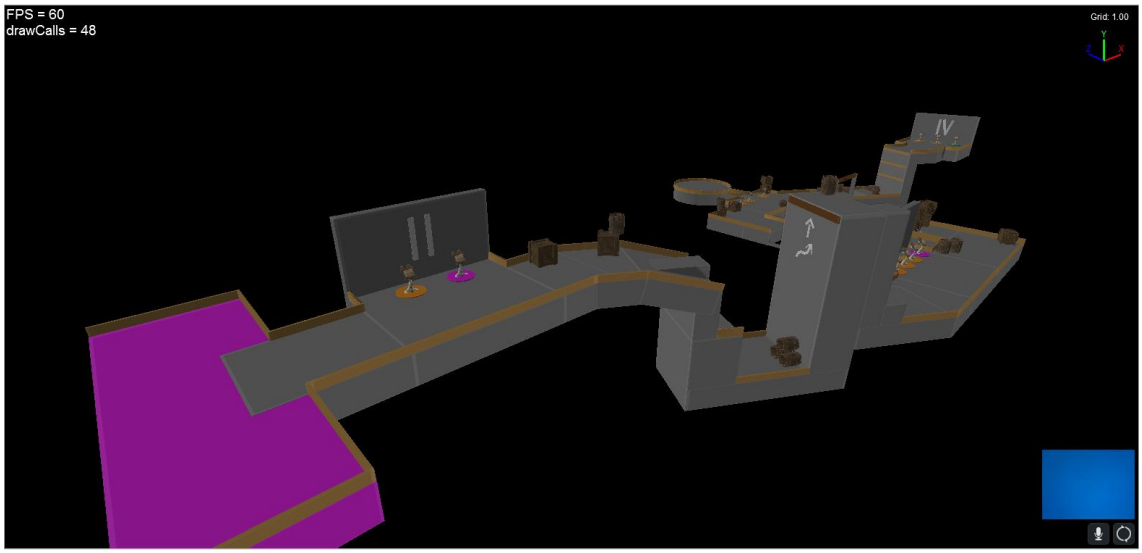
5 Initial content analysis

5.1 About the existing content and methods of analysis

In this section, the initial state of gamification of the "Shadwen" editor is analyzed to pinpoint the most apparent problems. In addition to the writer's own initial user analysis, the gamification analysis based on Kapp's definition and the questionnaire answers are presented. Conclusions about possible improvements are made based on these three analyses of the existing editor content.

5.2 The analysis based on writer's initial experience

The editor training program, in its current form, is a combination of content gamification and the structural gamification. The levels create a clear structure of lessons of different subjects, but at the same time it is a gamification of the subject of learning a new software. Player runs through the levels and at the same time is provided with information of how the editor works and how the world is built. (PICTURE 8)

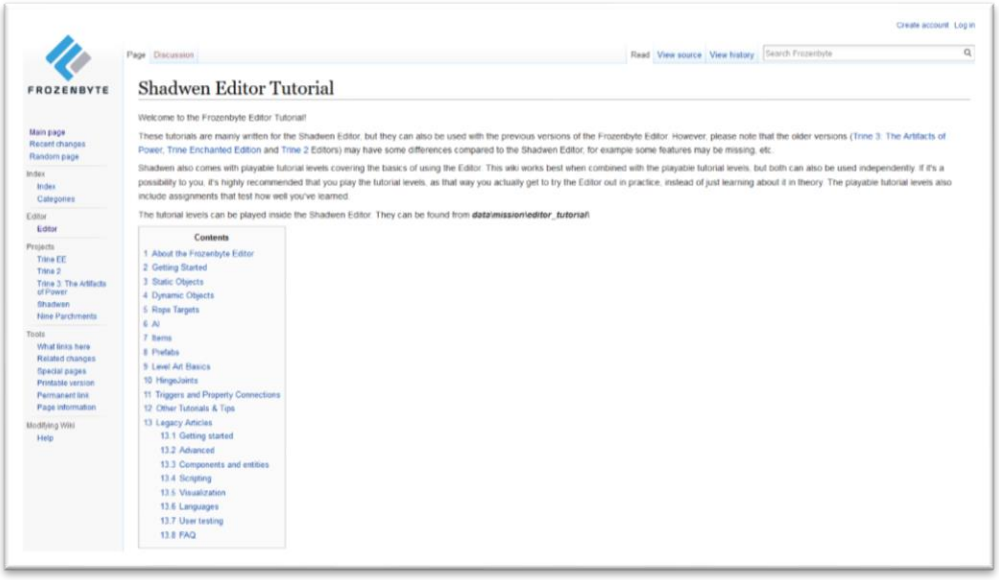


PICTURE 8. Tutorial level.

There are a few apparent problems when it comes to user immersion and feedback that give a good idea of which features could make the learning experience easier for the user.

The biggest issues with user immersion were the difficult naming convention of game editor's entities and objects, the fact that the user needs to jump back and forth from the editor view to game view to double check instruction information and the constant need of Frozenbyte's wiki page. (PICTURE 9) All these problems break the immersion when

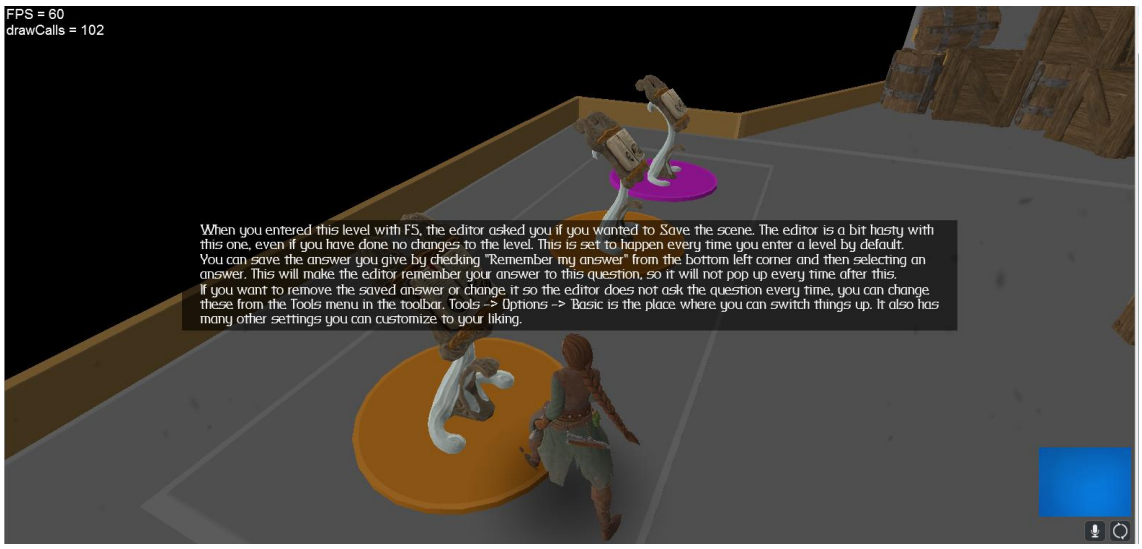
the user needs to stop to doublecheck or backtrack constantly. This should be minimized to streamline the experience for the user.



PICTURE 9. Frozenbyte Wiki. (http://wiki.frozenbyte.com)

The naming convention is a problem that cannot be helped due to the work amount and old dependencies inside the editor. What makes this especially difficult to the user is that the names differ completely from the commercially used engines. For example, Unreal4 and Unity use “Trigger volumes”, but Frozenbyte engine’s equivalent for that is “PlayerBoxCollectorArea”.

The issue of jumping back and forth between editor mode and game mode is because the task instructions are only displayed when the user activates “books” inside the game mode. This happens by walking in front of a book in game mode which displays the information text if the user stands near the book. (PICTURE 10) When the user has read the task or the information the book provides they jump back to the editor mode where they need to replicate the task. When the mode changes, the instructions disappear. The long entity names and the amount of information that is presented makes it difficult for the user to remember the instructions on one go and this creates tedious double checking between the two modes. This makes progressing slow, breaks the flow and takes the user away from the actual tasks at hand. User should be able to concentrate on the relevant subjects and the books are not an engine feature that should take any extra time to use. They are a mechanic made to guide the user and make their learning easier by providing information when the user proceeds in level.



PICTURE 10. Activated book entity.

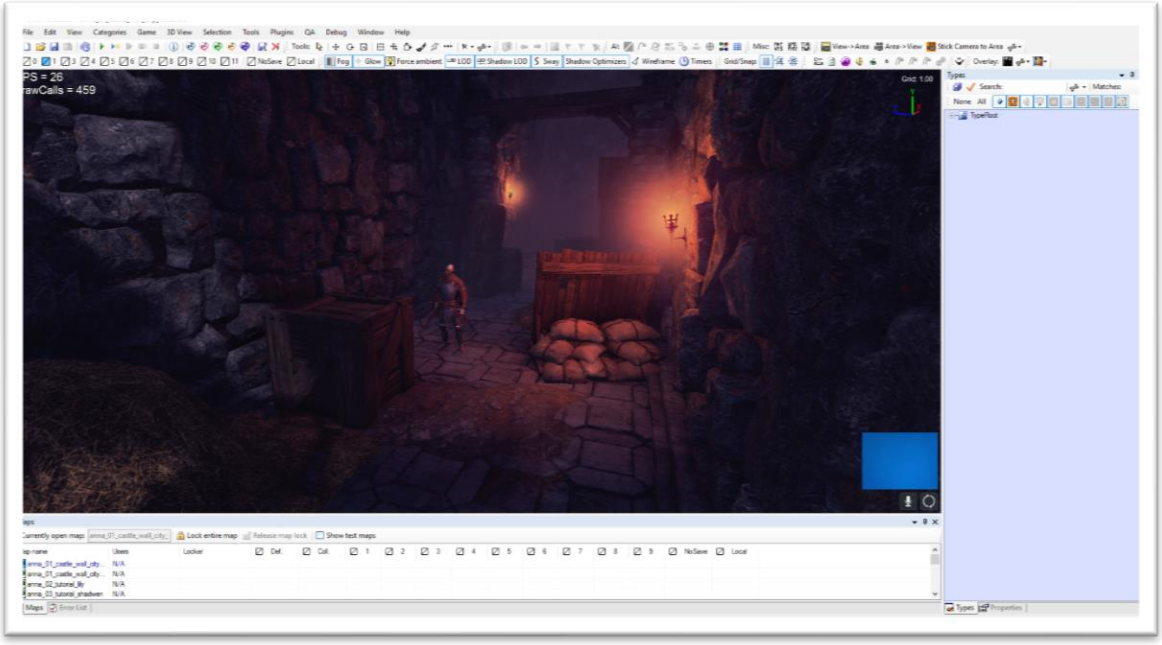
Frozenbyte has created wiki pages for all the tutorial levels that provide the same information as the level itself, but in a more detailed manner. Often it is more convenient for the user to just find the right wiki page and follow the instructions from there. This is not optimal if the design aims for the user to achieve a flow state while just playing and progressing with the tasks inside the level. The levels should be possible to complete just as they are. They should present enough information for the player in a clear and coherent manner. There should not be any need to use external sources of information. The wiki should be used as a support to study specific subjects that the user wants to know more about or in a real problem situation.

The biggest issue of user feedback is that the level progress is not being communicated to the user. When the user opens a level, besides the subject title, they have no idea what the level consists of or how long it is. There is no progression tracking inside the level and sometimes the user needs to guess if a task is done since there is nothing to indicate the successful completion. Adding progression feedback would help the user to see where they are in the level and possibly see what subject is coming next. This would eliminate the possible confusions or frustration about not making progress.

These are some of the issues that could to be addressed if the goal is to further motivate and engage the user. This will make the learning experience more convenient for the user.

5.3 The Gamification analysis of the editor

The editor used in the purpose of this thesis is the version v4.00 that comes with Shadwen. (PICTURE 11)



PICTURE 11. Shadwen editor v4.00.

When analyzing the content through Kapp's elements following can be stated:

Game-based: The project aims to gamify learning of a game editor. It uses the key mechanics of Shadwen for movement inside the levels and that makes the solution very game based right from the start.

Game mechanics: There are ten tutorial levels covering different subjects. Inside those levels are information in the form of books, design examples and tasks which the user completes and thus progresses inside the level. Complete level, complete subject. The key movement mechanics of stopping time and rewinding from Shadwen support the tasks and make trial and error learning more convenient.

Game aesthetics: Level list and the third person view of game itself. Other than that, the editor does not have supportive game-like aesthetics. It is closer to a basic image or video editing software.

Game-thinking: This is present since the solution is based on the game itself. It also presents the tutorial levels and the information inside them in a linear game-like manner, though nothing prevents the player skipping subjects they are not interested in.

Engage: There really is not any additional means of engagement used to affect the player and there are issues that can break the concentration of the user playing the levels.

People: New employees that need an easy way to get acquainted with the editor or consumer user, the players, that want to learn how to create content by themselves.

Motivate Action: At this point the project relies almost solely on extrinsic motivations, since the primary target group is the new employees of Frozenbyte. This might be enough for the primary group that have the motivation of learning the tools of their trade as fast as possible to prove their worth. The secondary group, the consumers, are most likely motivated by intrinsic motivations if they choose to learn the editor. Some additional motivation for consumer user could be considered.

Promote learning: The book entities are used to relay information about good design and then right after, the tips are demonstrated inside the level. For example, optimal jump height or length. Steam also has a general discussion and workshop discussion board for the users to post questions in. The community managers at Frozenbyte oversee the discussions and provide answers when needed. Otherwise this section could be improved greatly. There is no feedback on player's actions. The tutorials do not encourage competition, nor collaboration.

Solve problems: The aim is to make learning of the complex subject of game development easier and more approachable.

Based on this analysis through the elements it can be seen that the base for gamification is present, but there are various ways how the game aesthetics, motivation for action, engagement and promotion of learning could be enhanced. These are the areas to further emphasize in the practical part of this thesis.

6 Analysis

6.1 The Shadwen editor tutorials questionnaire

To gather some more user experience data, a questionnaire was constructed to map out the strengths and weaknesses of the current editor training program. In September 2016 Frozenbyte employed new level artists who went through the tutorial levels as means to get them familiar with the tools. After they had completed the levels they were asked to answer the questionnaire (See Appendix 1).

The goal of the questionnaire was, in addition to establishing the strengths and weaknesses, to find out if the new employees felt that they were well equipped for the job after playing through the tutorial levels. They were asked questions about their background with different game engines to establish their base knowledge about game engines and their most common practices. They were also asked about their preferred method of learning new software.

It is necessary to mention that this questionnaire was very brief with only four participants, but the answers do give a valuable second opinion on the possible improvement issues of the editor tutorials (See Appendix 2).

6.1.1 The Results

It was important to establish the user background of the employees that participated in the questionnaire. When asked about their history and the most used engines the answers were consistent. All four of the participants had used other game engines before playing Shadwen tutorials. Most used engines were Unity and Unreal Engine 4.

Next, they were asked about the methods they had used to study different engines and what was their preferred method of learning new programs. Previously used methods of learning divide evenly between video tutorials, official documentation, exploration of the editor and help of the community. Only one of the participants had used playable tutorials before. As for the preferred methods of learning the participants list video tutorials and actual guidance from a live tutor.

After establishing their background, they were asked about if the Shadwen tutorial levels give a good idea how the levels are constructed and which level took the longest time to complete. All the participants felt that the tutorials gave a good basic idea of how the levels are constructed. The level that took most time to complete was “Hinge joints” a level that teaches how to create physics puzzles with joint and hinge entities.

Next, they were asked about which subject they would like to learn more about and why. The answers of the participants were varied, but there were common themes mentioned such as lighting and level art in general.

When asked about whether the learning through Shadwen tutorials was easy, only one of the participants felt that learning the editor was very easy. Other three thought it was ok, meaning it was not too easy or too difficult. None of them felt that it was too difficult.

Next, they were asked about the issue of “The Books” and if they felt that the books provided enough information to complete the tasks. They were also asked if they had any problems following the instructions, and if so, what kind. Three out of four participants mention that they had to use the wiki to complete the tasks. Two out of four had also asked for a senior employee to help. Fourth one said that the information was all there but it was tedious follow throughout the task and because of this the wiki was preferred over the instructions the level itself provided. Two of the participants also mentioned that even though the instructions were there, they had some problems internalizing the vast amount of information because of mild dyslexia.

When asked about was it clear when they had completed the given tasks, all the participants felt that the completion of the task was clear most of the time, but not every time.

The use of Frozenbyte Wiki was also an issue and the participants were asked about if they used the tutorial while completing the task and how often. They were also asked about possible problems when using the Frozenbyte Wiki. All the participants had used the Frozenbyte Wiki while working on the tasks, but only for some of the most difficult levels. For three out of four participants, there were not any problems regarding using the wiki. One of the participants felt that finding the correct information in the wiki was sometimes tedious.

When asked what was the most difficult subject to approach and why, the participants stated that two of the most difficult subjects were the “Hinge Joints” and “Items”. Item crafting level was confusing to two of the participants since it was not related to the job of a level artist, more to the mechanics of the game itself.

At the end of the questionnaire the participants were asked what they would add to the tutorials, if they could choose and add one feature. Three of the four participants said that they would prefer progression tracking or feedback system for the tasks. Fourth one mentioned more accessible instructions with a possibility of additional video and pictures.

6.2 The conclusions of analysis

The main points of each analysis are here explained and compared to find the possible similarities. This will lead to the problem areas of Editor Learning Project that need the most improvement in the means of gamification.

The Analysis based on elements of gamification showed that there are areas to improve. Those being game aesthetics, user engagement, motivate action and promotion of learning. Aesthetics could be used to, for example, show the progress of levels. Overall and individually. There could also be a clear way to demonstrate to the user when the tasks are done. This kind of progression tracking is completely absent from the current solution. For the issue of player engagement, the previously mentioned progression feedback could be one solution. At this point the editor tutorial project relies almost solely on the users own intrinsic motivation to learn the subjects in question. Since the target group for this project is mainly the new employees, the extrinsic motivation to learn your tools of the trade should be enough. Despite all that this is still one thing to consider in the practical part of this thesis. For extrinsic motivation to the secondary target group, the players, badges for each completed subject or some sort of community acknowledgement could be considered. This in turn could also help promote the learning aspect. User completes the task, gets a badge for it to show that they have knowledge of the editor. Another aforementioned element that could further support learning could be the progression feedback inside the level. One could divide the tasks into smaller segments, that are visually seen via progression tracking, to complete the tasks step by step.

The analysis on thesis writer's initial experience on the editor tutorials concluded that although the information that is provided inside the levels is divided into small sections to maintain pacing of information, the information is still tedious to use at times. This is because of the occasional wall of text and unconventional naming conventions that make remembering what the task consists of very difficult when the user has to jump between the "play" mode and the" editor" mode. It was also not clear when the task was done correctly or how far into the level the player had progressed.

All of the questionnaire participants had used other editors before so they had the basic knowledge of how things work. In addition to exploring the editor on their own the participants preferred to use videos, documentation and community help as the preferred methods of learning. Considering the gamification theme of this thesis, these learning methods will not be further studied, but they will be used as tools to convey additional information for the user in the practical work.

As for the content, the participants wished more information on level art and lighting, since there was only one level on that subject in the existing ten levels. Other important points from the questionnaire were the fact that although the tutorials gave the information necessary for the users, the implementation of that information was tedious. Participants used the Frozenbyte wiki frequently while working on the tasks and they did so without any major problems. The most requested additional features were the progression tracking and visual feedback.

Based on these results the aim of the practical part of this thesis will be about finding a better way to display the information for the user, how to visualize the progression tracking and feedback to the player and how the learning could be further emphasized through the preferred learning methods in the tutorial progress. Secondary aim is to find ways to motivate the player community to learn and use the editor.

7 Practical work: Design Document

7.1.1 Statement of practical work goals

The goal of this design document is to offer a solution that tackles the usability problems that were discovered in the analysis work done in prior to this practical work. This solution aims to resolve the issues concerning user feedback, progression tracking and aims to find ways to present information in a convenient and coherent way to the user so that the experience of playing through the tutorial levels would be as easy as possible. The main target user group is the new employees of Frozenbyte, while the consumers, players, work as secondary target group.

7.2 "First Time Launch" window solution description

"First Time Launch" window is a solution that opens when the user starts the editor for the first time. The window provides some basic knowledge about the editor and guides the user to places to get more information about its use. First Time Launch window provides additional channels and means for learning for the user to choose from and it provides information about the very basics of the editor before even launching the tutorial levels. The aim is to make the start easier for the user by giving additional tools of learning and guiding the user to the official sources of information.

7.2.1 "First Time Launch" user interface example

The user chooses to launch the editor for the first time. When the editor opens, a pop up window will open over the empty scene. (PICTURE 12)

PICTURE 12. First Time Launch window interface layout.

The window displays four major options to choose from. Tips section will open a page that provides some of the basic things, for example, the most used windows, good practices and a mention about the “Tutorial Helper” window. The Community section will open the Frozenbyte forums or the Steam community forums where the user can discuss topics and seek help for possible problems with the editor. The Wiki section will open the Frozenbyte wiki page that has documentation about the editor and how it works. The video section will open Frozenbyte’s youtube channel that has tutorial videos covering various subjects.

Once the user has looked through the links they may choose to flag the “Do not show this again” option and close the window. This way the window will not appear again during the startup of the editor.

7.3 “Tutorial Helper” solution description

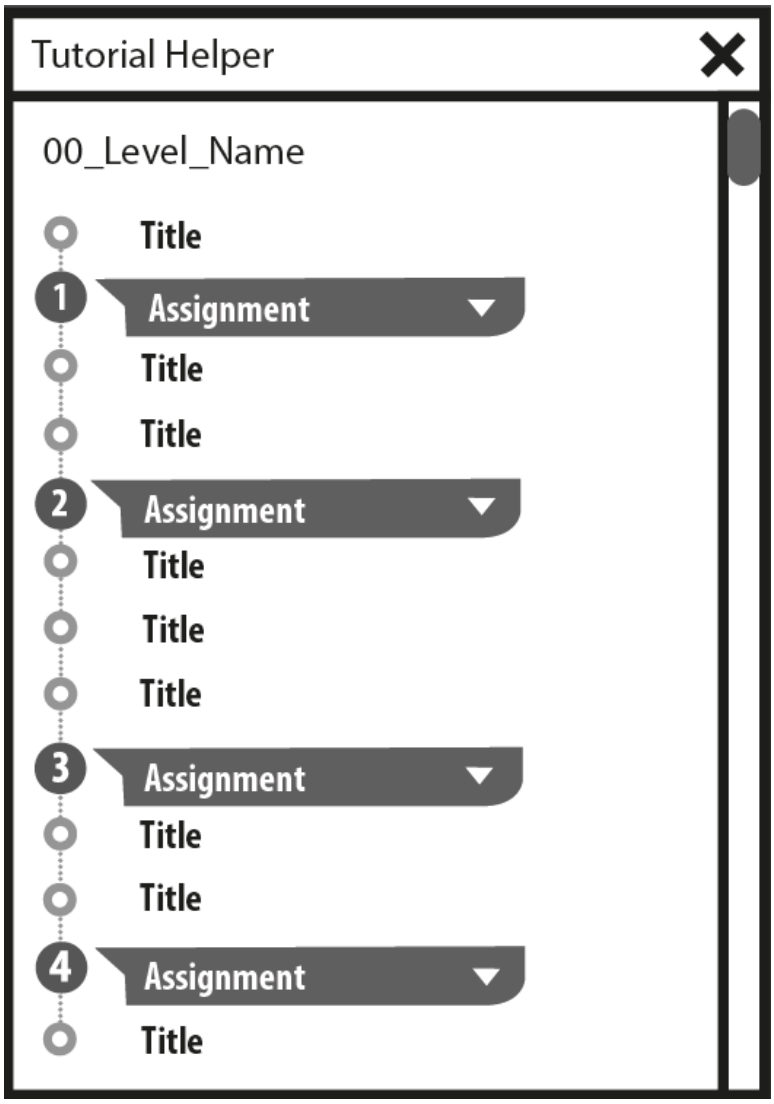
Tutorial helper is an additional window in the editor layout that helps the user to keep track of their progress and the task information inside the tutorial level. When a tutorial level is opened, the editor asks if the user wants to open the Tutorial Helper. It can also be launched later from the same menu toolbar than other windows and user has the freedom to choose if they wish to use it.

When in use the Tutorial helper will keep the information from the book entities available for the user at all times, as well as present the overall progress of the level by visualizing the active and non-active book entities. This will give active feedback to the player about their progress and also make it easier for the user to track if they have missed any books on the way. The purpose of this solution is to communicate the overall progress as well as make the user experience of the tutorial levels more streamlined, by eliminating the unnecessary back and forth jumping between “play” mode and “editor” mode enabling the user to concentrate on the tasks at hand. Additionally, links to wiki and videos can be embedded to the Tutorial Helper view to offer additional ways of learning about the subject in question to the user.

7.3.1 ” Tutorial Helper” user interface example

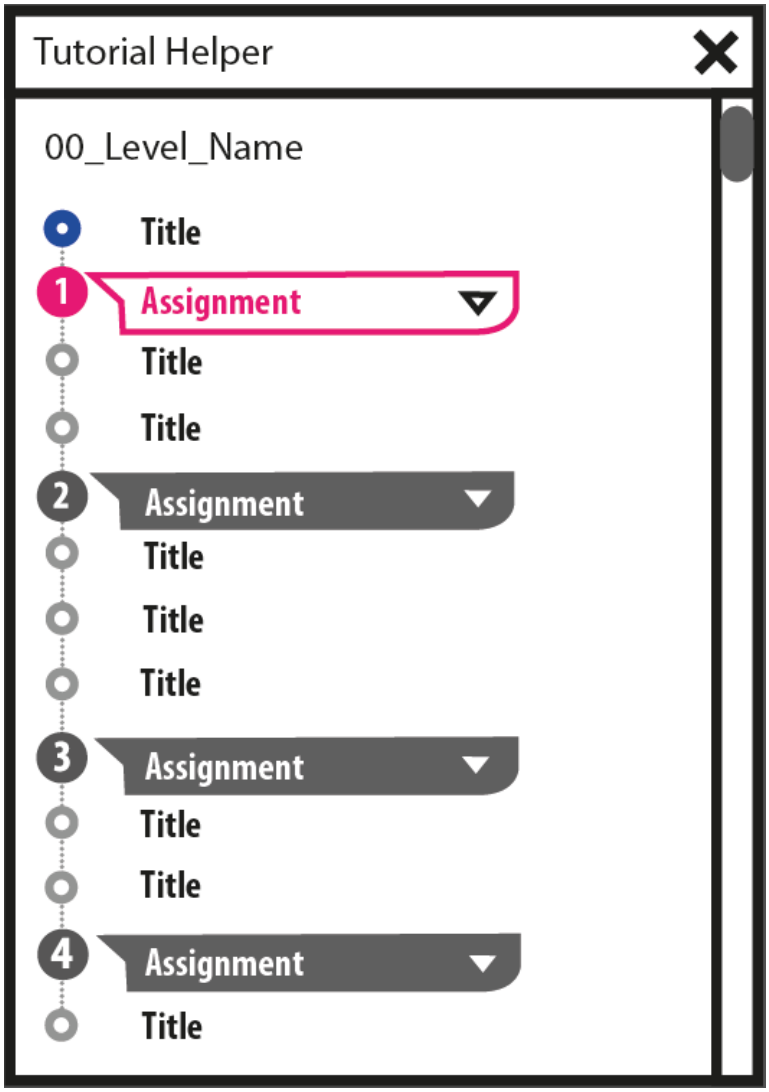
When the user opens the tutorial levels for the first time, the editor asks if they wish to open the “Tutorial Helper” window. If the user chooses “yes” the tutorial helper will open in an individual window that can be docked into the editor view or it can be kept as a separate floating window. (PICTURE 13) If the user has initially chosen “no” as an answer to the question, they can also open “view” from the upper toolbar of the editor and click “Tutorial Helper” to open the window.

Tutorial helper displays all the book entities as dots. The assignment books of the level are highlighted with additional graphics and numbered to make it easier for the user to find them and to keep track of the practical tasks of the level. When the helper is opened for the first time the dots are shown as grey until the user activates the corresponding books in the “play” mode.



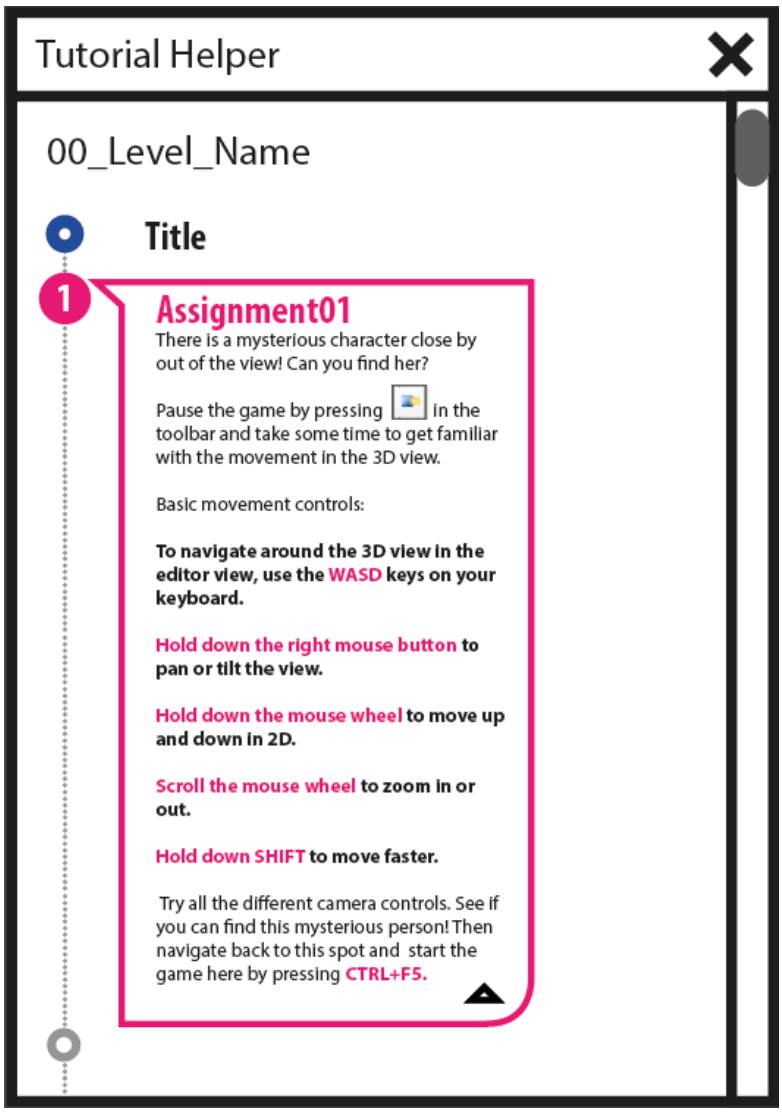
PICTURE 13. Tutorial helper window mockup with inactivated dots.

When the books have been activated the color of the dots correspond the book stand colors inside the level. To activate the books in Tutorial Helper the user presses “play” and starts to proceed inside the level. Book entities activate when the user walks up to them. When the books are opened for the first time in “play” mode the same information updates itself to the “Tutorial Helper”. (PICTURE 14.)



PICTURE 14. The first two books activated.

After this the user can access the information provided by the books just by clicking the colored dots inside the Tutorial Helper. This works in both the “play” mode and the “editor” mode, thus eliminating the tedious checking between the two modes. (PICTURE 15) The assignment information texts may also have links to Frozenbyte wiki or tutorial videos to provide further information about the subjects in question.



PICTURE 15. Opened assignment information text bubble.

Once the books are activated in the Tutorial Helper the user can also right click the dots and select “Locate in 3D view” to move the editor camera in front of the corresponding book. This helps the user to locate possible assignment areas with ease.

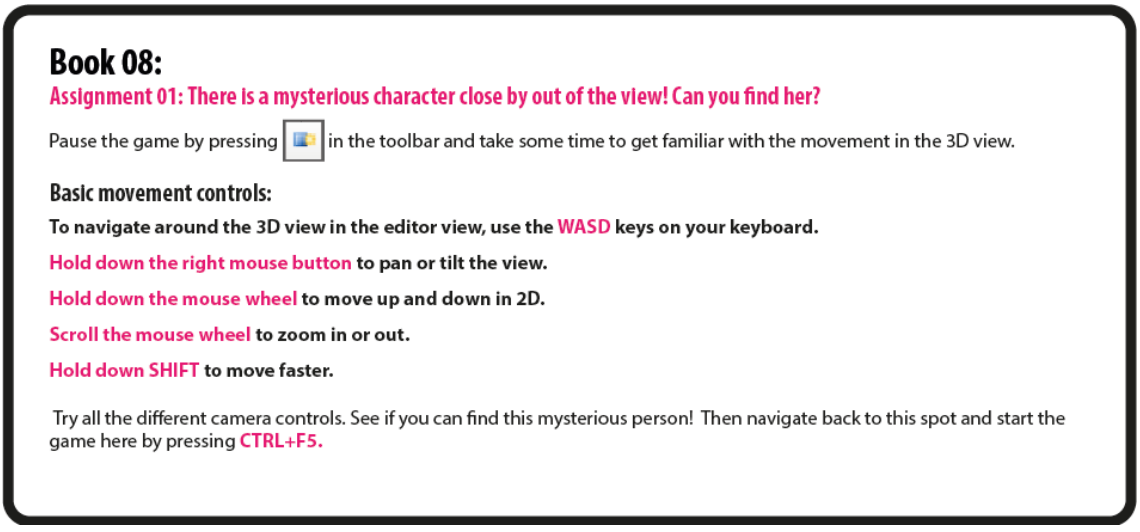
7.4 Additional suggestions of improvement

To provide additional motivation for the secondary target group, the players that are engaged in the Steam Community, trading cards could be earned from completing the tutorial levels that could be crafted into a badge. When the editor is being used through the Steam application and all the books are activated inside the tutorial level, the player gets a pop-up saying that a trading card has been earned. Once the player has completed all the levels they can craft a badge out of all the achievements that can be seen in their Steam

profile page. If the Steam trading card system does not allow this kind of system, alternatively traditional achievements could be used. The player earns achievements completing the levels and a mastery achievement once all the levels are completed.

The content of the Shadwen tutorials was not the main focus of this thesis, but in the future, it should be considered to whom the level tutorials are made for and what information they need in their work. Currently the Shadwen levels are used to train new level artist, but the questionnaire answers gave indications that the subjects they cover could be further improved. They cover most basics of building a level with the editor in question, but they also cover subjects that are not relevant to the level artists, but more so for secondary target group, the players who produce their own additional content.

The presentation of the book entities information needs some adjustments to make the reading effortless and coherent. The typehead should be changed to a simpler one that is easier to read. The current typehead is more for titles or menu texts. Simpler typehead will make the reading easier and the relevant terms should be highlighted with colors so they can be spotted with just a one glance. (PICTURE 16)

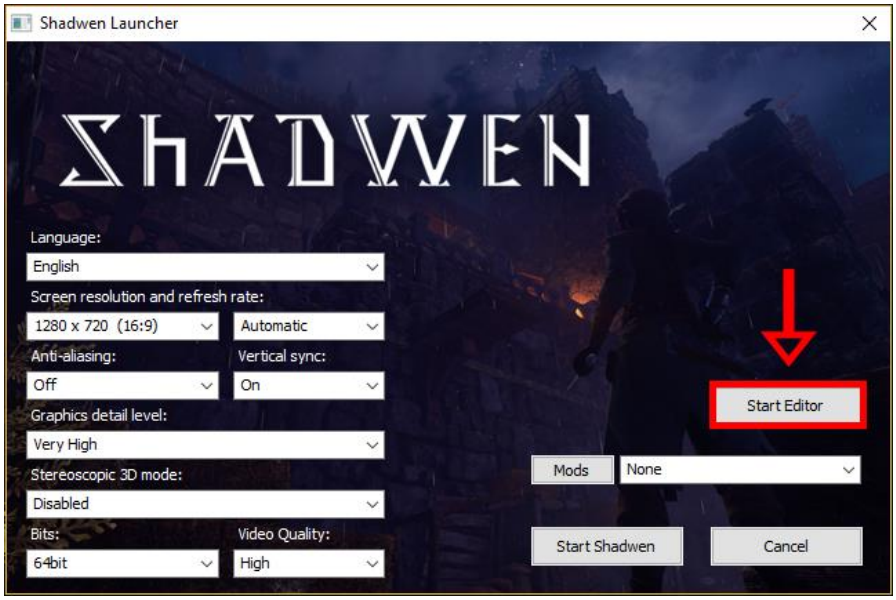


PICTURE 16: Book text display example.

7.5 01_getting_started – example user scenario

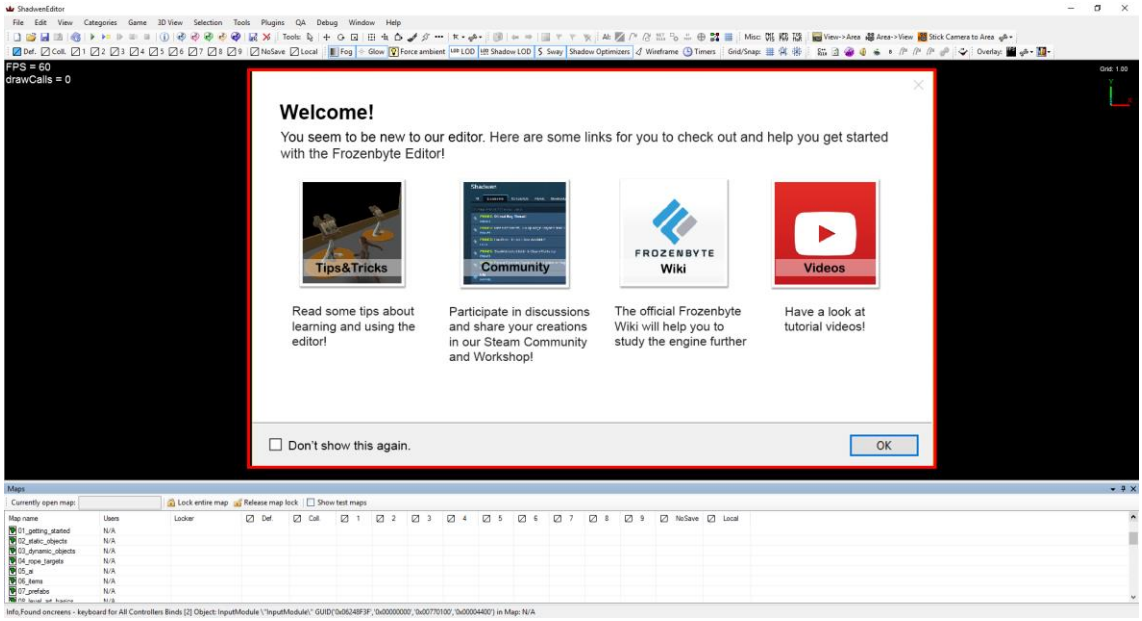
In this section, the functionalities of the presented solutions are shown in a step by step user scenario of the level “01_getting_started”. User actions and solutions are highlighted in red and additionally the solutions are depicted enlarged to enhance the understandability of the thesis visualization.

The user is launching the editor through Steam service. They click “Play” on Shadwen in the library. This opens the launcher. In the game launcher, the user chooses “Start Editor”. (PICTURE 17)



PICTURE 17. Editor launcher.

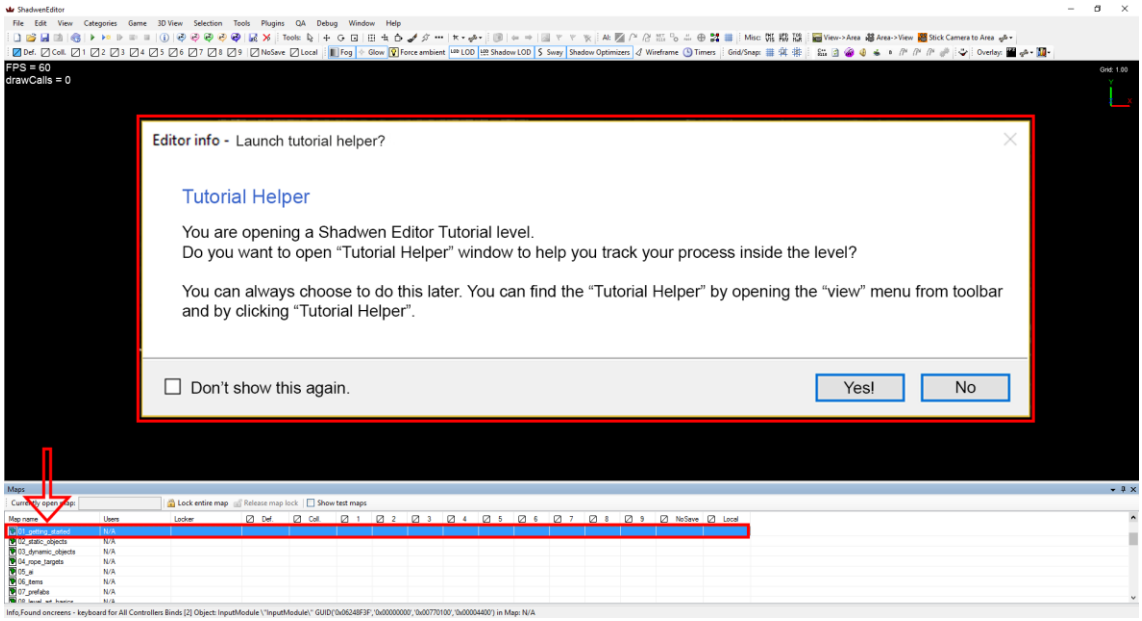
This starts the Frozenbyte editor. Upon the first launch the editor will show the “First Time Launch” window for the user. (PICTURE 18)



PICTURE 18. “First Time Launch” window in the editor.

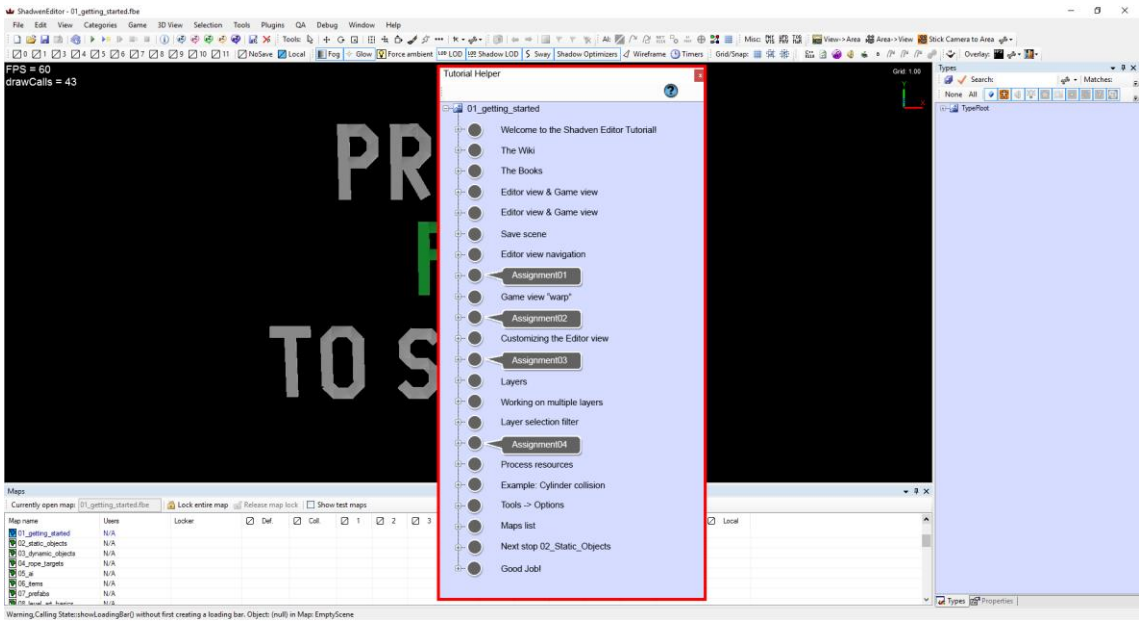
After the user has read through the links they click “ok” which closes the “First Time Launch” window. After that they double click the first tutorial level “01_getting_started”

from the maps menu at the bottom of the screen. (PICTURE 19) This opens a pop up window asking the user if they wish to launch “Tutorial Helper”. The user can also do this on a later time if they wish.



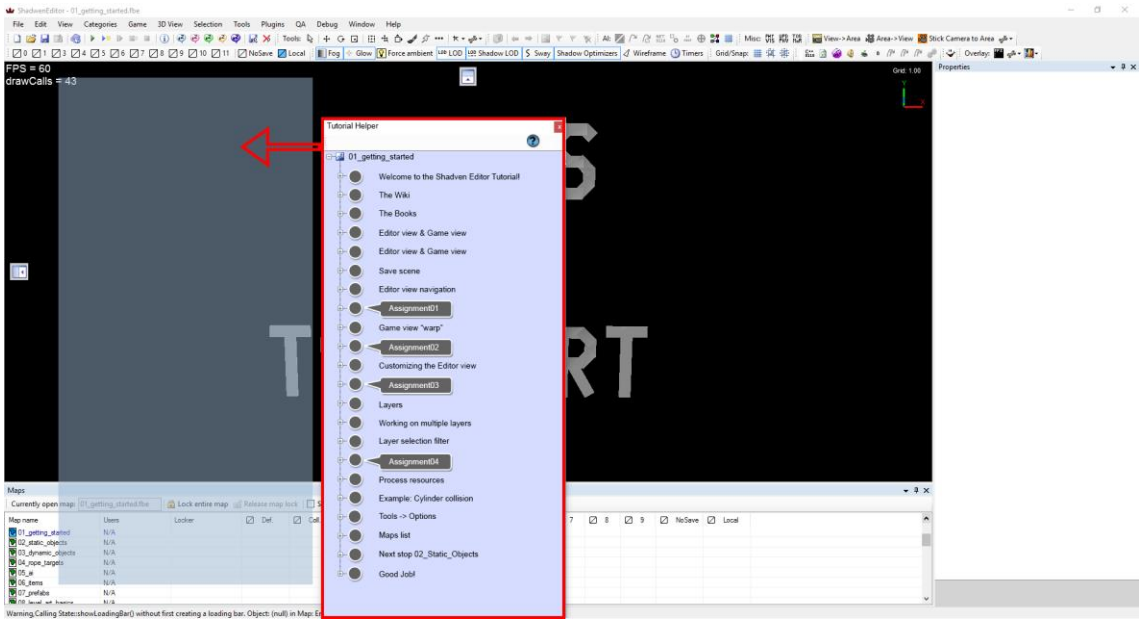
PICTURE 19. After clicking the tutorial level, the “Tutorial Helper” pop up appears.

The user clicks “Ok!” and this will open the “Tutorial Helper” with the tutorial level. The tutorial helper will open as a new window hovering over the editor view. (PICTURE 20) It displays the instructions books for the opened level. In the beginning, they are inactive and thus shown as grey.



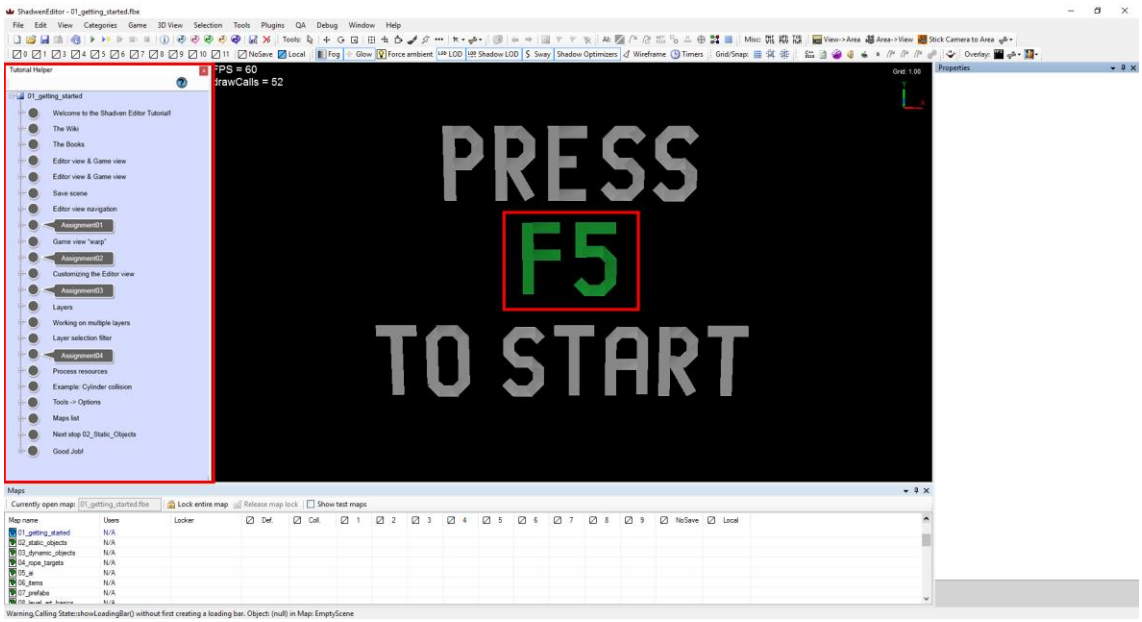
PICTURE 20: “Tutorial Helper” in the editor.

The tutorial helper can be used as a floating window over the editor, moved to an extra screen or it can be docked to the editor view. The user chooses between these options and docks the Tutorial Helper to the left side of the editor view, by clicking and holding with the left mouse button while dragging the window to the preferred position until the docking icon appears on the side of the screen. (PICTURE 21.)



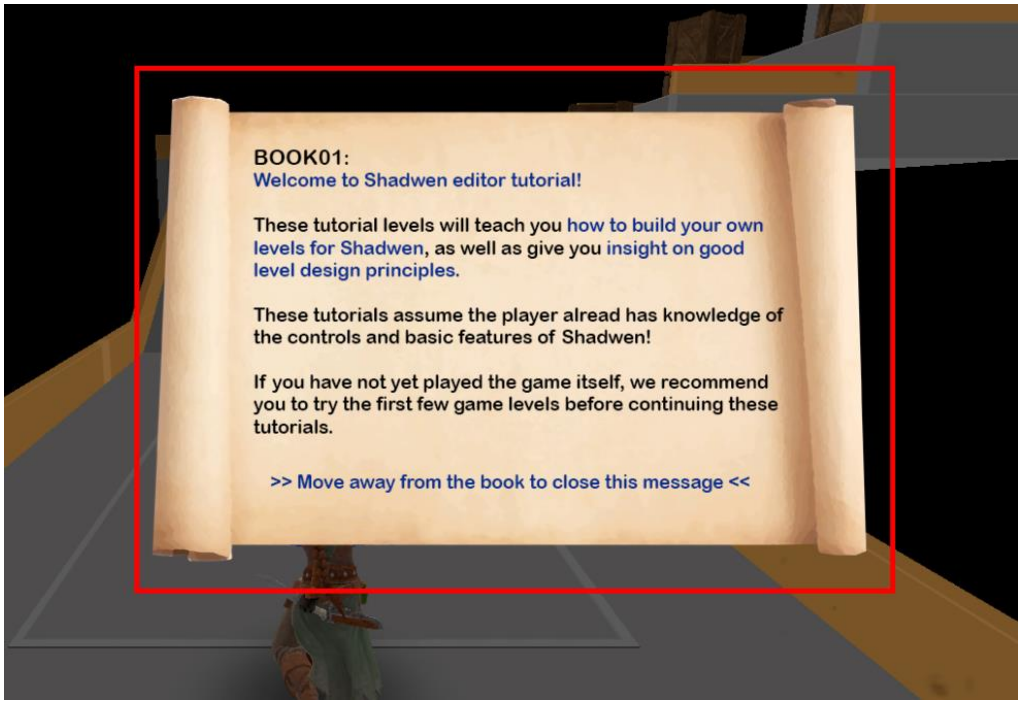
PICTURE 21. Docking the Tutorial Helper.

The user has now docked the tutorial helper and they press F5 to start playing the tutorial level. (PICTURE 22.)



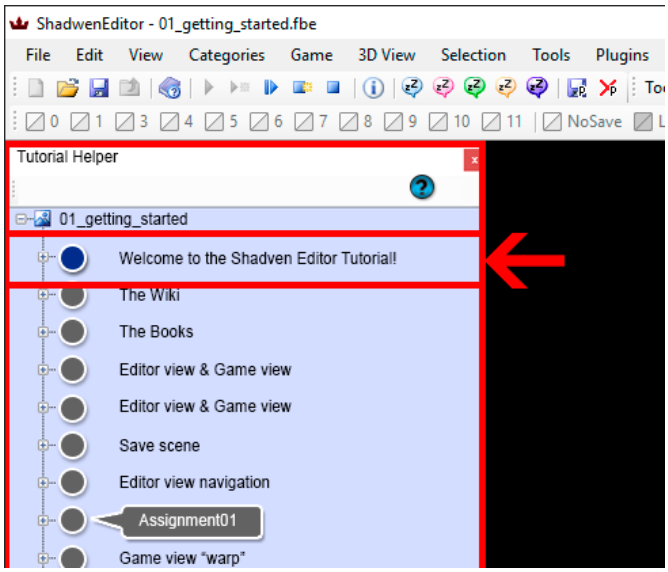
PICTURE 22. The starting screen of the first tutorial level.

This starts the level. In “play” mode, the user runs to the first book entity of the level and activates the book for the first time. The activated book displays the instructions in a coherent form on screen with highlighted keywords. (PICTURE 23.) The highlight color corresponds the color of the book in question.



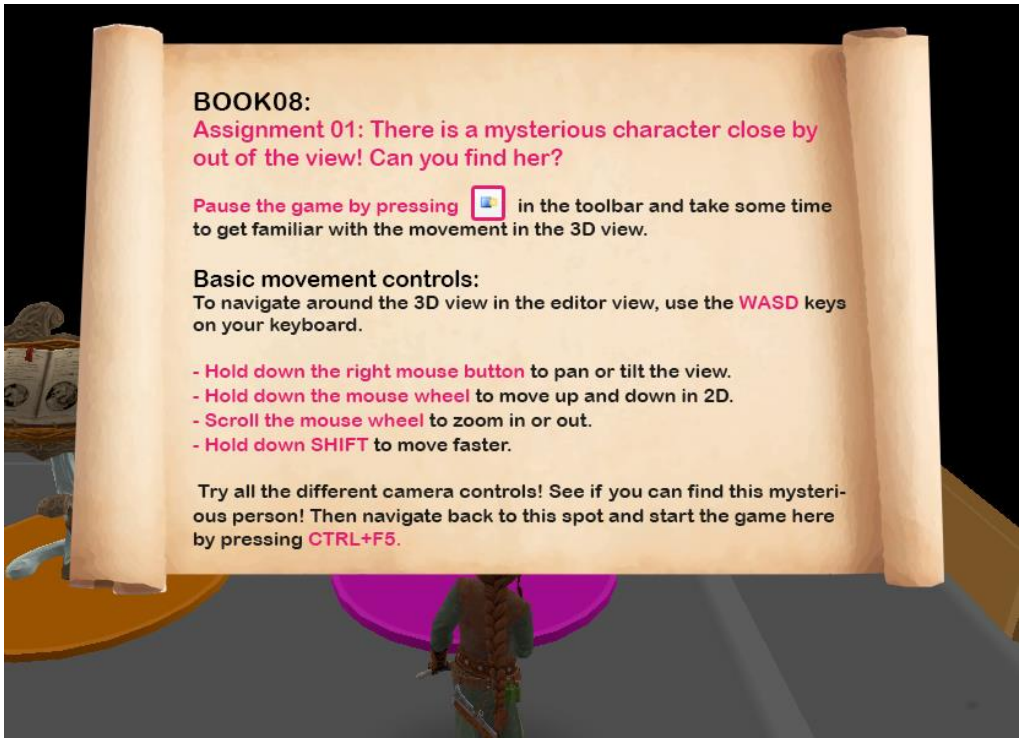
PICTURE 23. New book info layout activated in “Play”.

Once the book activates in the level, the first book dot activates in the Tutorial Editor view. (PICTURE 24.) It can now be clicked so that it displays the book information in the helper view. The user can also right click the dot and choose “Find in 3D view” in “Editor” mode. Clicking this will warp the camera into the same location as the book that corresponds the colored dot and title inside the helper.



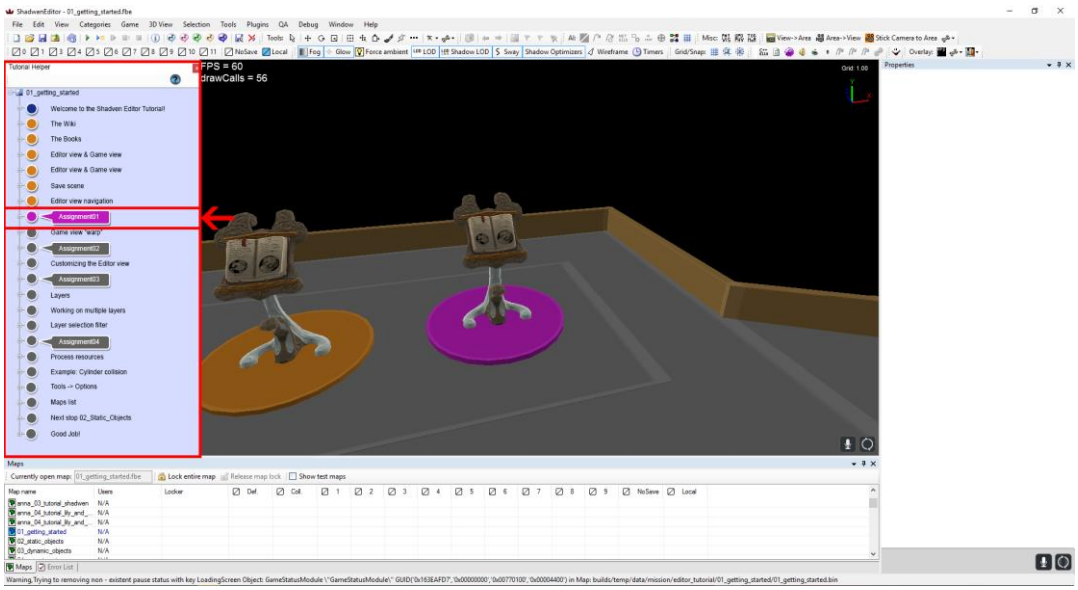
PICTURE 24. First book activated in “Tutorial Helper” with the corresponding color.

The user continues to proceed through the level while reading the books, until they arrive to the first assignment book. Activating this will present the user with a task as follows. (PICTURE 25)



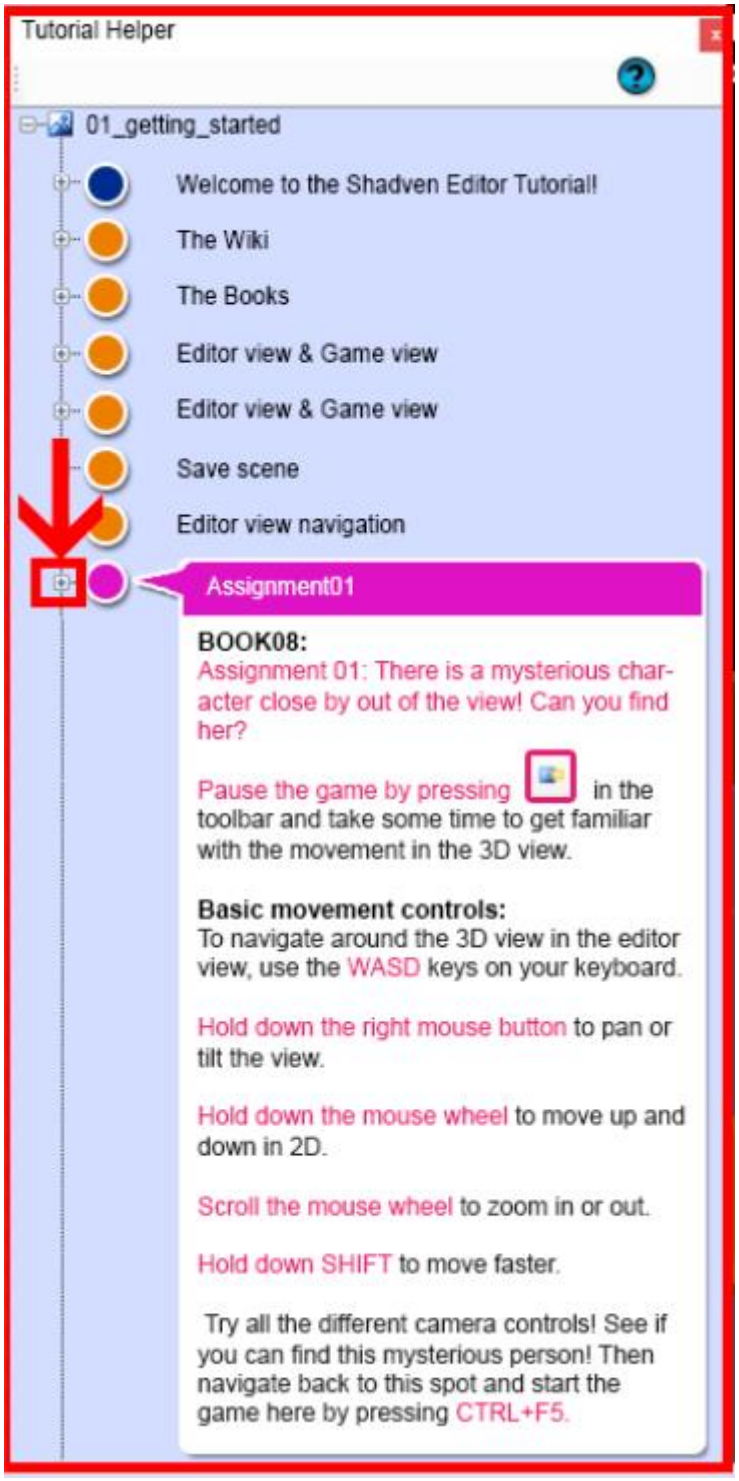
PICTURE 25. The first assignment of the level.

This assignment requires the user to leave the "play" mode and re-enter "editor" mode. Once the user clicks the "pause" button from the editor toolbar, the book info disappears from the center of the screen. (PICTURE 26) However "Assignment01" in Tutorial Helper window is now activated.



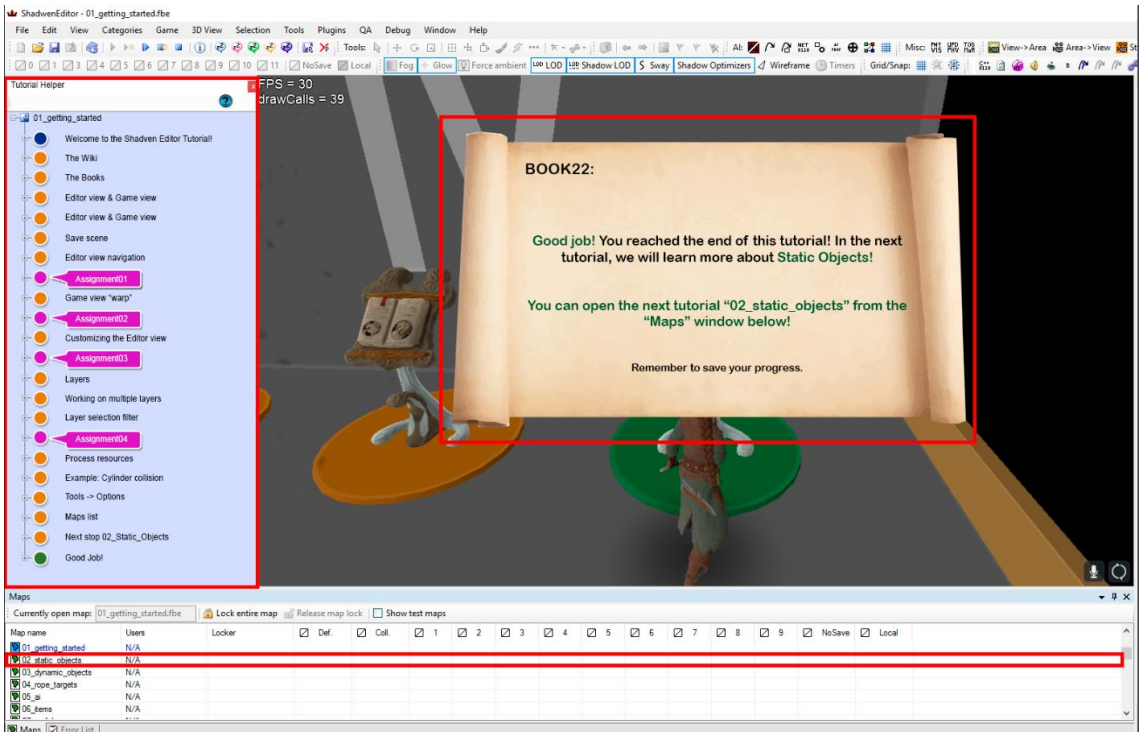
PICTURE 26. User's view after pausing the game.

The user clicks the small "+" sign in front of the activated "Assignment01" bubble to view the content of the assignment book in Tutorial Helper view. (PICTURE 27) The user can now read the information again and complete the task accordingly without unnecessarily jumping between the "play" mode and the "editor" mode.



PICTURE 27. Tutorial Helper displaying the assignment information.

The user completes the assignment and continues to move forward inside the level while checking the information from the tutorial helper as needed. After completing and reading all the books they reach the final green book. (PICTURE 28.) This book will congratulate the user and instruct them to the next level. This window also reminds the user about saving the progress.



PICTURE 28. The end of the level.

8 Conclusions

The initial goal of this thesis was to explain what gamification is and how to successfully implement it. This was done by analyzing the existing gamification of the Frozenbyte's Editor Training Project and seeing what areas could be improved.

Karl Kapp's definition of gamification was chosen and used as a theoretical base for the project analysis. A user questionnaire was done to further analyze the project. The questionnaire sampling was very limited with just four participants and thus it cannot give any definitive answers, but when compared to Kapp's definition analysis results it gave further insight to the problem areas of the existing gamification. In addition to this the writer of this thesis worked as a new level artist at the company during the making of this thesis and her initial experiences were also used as part of the analysis.

These three different analyses resulted into the areas that were most in the need of improvement. The main problem areas were information visualization, progression tracking and feedback for the user. Secondary objectives were to offer preferred learning methods in the tutorial progress and how to find ways to motivate the secondary target group, the players, to learn and use the editor.

With these pinpointed problem areas and the main target group in mind, the practical work solution was designed. The presented Tutorial Helper window helps the user to keep track of the task information and level progression. It makes the tutorial experience more streamlined and enables the user to concentrate on the tasks at hand. In addition to Tutorial Helper a few more changes were suggested, such as the First Time Launch window that guides the user to the official channels of information and offers further study material to choose from.

The Questionnaire participants all wished more information on actual level art and lighting, so the art content should be further improved. In future, if the editor training program is expanded to cover more employees, the needs of every target group should be studied and the content of the levels should be tailored to meet their needs. This approach was also suggested in the studies referenced in the theory section of this work.

In addition to this, some ways to motivate the secondary target group could be considered inside the steam community. This could be done via badges and community recognition.

The method of analysis used in this thesis was successful for the Editor Training Project, however this probably would not be sufficient for a larger or monetized project where the gamification needs to be designed from scratch. In that case there should be more extensive studies about the needs of the gamification and the target user group. The Editor Training Project target users were easy to motivate, since learning the tools of their trade as fast as possible is a major extrinsic motivator.

The initial goal for this work was to analyze the existing gamified tutorials and present a solution for them. The secondary goal was to work as an example pipeline for gamification design.

The thesis managed to pinpoint some of the problem areas of the now existing tutorials and present possible solutions for them. As for being an example pipeline, the thesis defines what is gamification and the analysis is based on that definition to pinpoint the strengths and weaknesses. Analysis is then used to design the possible solutions for the editor, while considering the main target group which was the new employees. This way it successfully works as an example how gamification could be used and implemented in a smaller scale project or in already existing one.

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APPENDICES

Appendix 1. Shadwen Editor Tutorial Questionnaire

Shadwen Editor Tutorial Questionnaire 1(3)

A brief questionnaire about your learning experience with the Shadwen Editor Tutorials. The information gathered will be used in the Bachelor's Thesis work of Emma Valkki.

You can also use finnish language while answering the questions if that is more convenient to you. The answers will be translated by the author if they are quoted in the thesis work.

1. Have you used any other game engines before looking into the Shadwen editor?
   Mark only one oval.

   - ◯ Nope
   - ◯ Yes

2. If yes, which ones have you used?
   Check all that apply.

   - ☐ Unity
   - ☐ Unreal Development Kit (UDK)
   - ☐ Unreal Engine 4 (UE4)
   - ☐ CryEngine
   - ☐ GameMaker: Studio
   - ☐ I haven't used any game engines before in my life.
   - ☐ Other: _____

3. How have you studied their use?
   Check all that apply.

   - ☐ Video tutorials
   - ☐ Articles
   - ☐ Official documentation/Wiki pages
   - ☐ With the help of community and forums
   - ☐ Just by exploring the editor by myself
   - ☐ Via playable tutorials
   - ☐ I haven't used any game engines before in my life.

4. How do you prefer to learn new programs?
   Check all that apply.

- [ ] Via text & picture tutorials 2(3)
- [ ] Via watching videos tutorials
- [ ] Via trial and error by myself
- [ ] With the help of a teacher/tutor

5. After you played through the Shadwen tutorial levels do you feel that you have a good idea of how the levels are constructed?

Mark only one oval.

- ◯ Yes
- ◯ No

6. Which level took you the longest time to complete?

_____

7. Which subject would you like to learn more about? Why?

_____

_____

_____

_____

_____

8. Did learning the Shadwen editor feel easy?

Mark only one oval.

- ◯ Yes, it was easy!
- ◯ It was ok. Not too Easy. Not too hard.
- ◯ No it didn't.

9. Do you feel that “the books” provided you with all the needed information to complete the given tasks?

_____

_____

_____

_____

_____

10. Were the instructions easy to follow? Did you have any problems, if so what kind of problems?

_____

_____

_____

_____

_____

11. Was it always clear to you when you had completed the given task?

Mark only one oval. 3(3)

- Yes, it was always clear.
- Yes, most of the time.
- Seldomly.
- No it wasn't.

12. Did you use the Frozenbyte Wiki while working on the tutorial tasks?
Mark only one oval.

- Yes
- No

13. How often did you use the Wiki?
Mark only one oval.

- With every level.
- With some of the more difficult levels.
- Not at all.

14. Did you have any problems using the Wiki? If so, what kind of problems?

15. What was the most difficult subject to approach and why?

16. If you could add one feature to the tutorials, what would that be? (For example: Visual feedback, UI, Progression tracking, etc?)

Appendix 2. Shadwen Editor Tutorial Questionnaire Answers

Shadwen Editor Tutorial Questionnaire

A brief questionnaire about your learning experience with the Shadwen Editor Tutorials. The information gathered will be used in the Bachelor's Thesis work of Emma Valkki.

You can also use finnish language while answering the questions if that is more convenient to you. The answers will be translated by the author if they are quoted in the thesis work.

Have you used any other game engines before looking into the Shadwen editor?

- ○ Nope
- ◉ Yes

If yes, which ones have you used?

- ☑ Unity
- ☐ Unreal Development Kit (UDK)
- ☑ Unreal Engine 4 (UE4)
- ☐ CryEngine
- ☐ GameMaker: Studio
- ☐ I haven't used any game engines before in my life.
- ☑ Other: Twine, Hammer

How have you studied their use?

- [x] Video tutorials
- [ ] Articles
- [x] Official documentation/Wiki pages
- [x] With the help of community and forums
- [x] Just by exploring the editor by myself
- [x] Via playable tutorials
- [ ] I haven't used any game engines before in my life.

How do you prefer to learn new programs?

- [ ] Via text & picture tutorials
- [x] Via watching videos tutorials
- [ ] Via trial and error by myself
- [x] With the help of a teacher/tutor

After you played through the Shadwen tutorial levels do you feel that you have a good idea of how the levels are constructed?

- (●) Yes
- ( ) No

Which level took you the longest time to complete?

Hinges took about a day, took my time and tested stuff.

Which subject would you like to learn more about? Why?

Trigger events, because I find it'll be useful in future.

Did learning the Shadwen editor feel easy?

- ○ Yes, it was easy!
- ◉ It was ok. Not too Easy. Not too hard.
- ○ No it didn't.

Do you feel that “the books” provided you with all the needed information to complete the given tasks?

Not even close, there were times when I had to rely to Wiki and my seniors.

Were the instructions easy to follow? Did you have any problems, if so what kind of problems?

Wall of text, I have dyslexia of reading foreign languages. Otherwise I got fairly far by just using the books and trial &error.

Was it always clear to you when you had completed the given task?

- ○ Yes, it was always clear.
- ◉ Yes, most of the time.
- ○ Seldomly.
- ○ No it wasn't.

Did you use the Frozenbyte Wiki while working on the tutorial tasks?

- ◉ Yes
- ○ No

How often did you use the Wiki?

- ○ With every level.
- ◉ With some of the more difficult levels.
- ○ Not at all.

Did you have any problems using the Wiki? If so, what kind of problems?

Finding the correct part of the quide was sometimes tedious.

What was the most difficult subject to approach and why?

Items, it was partly done differently which confused me. Also I found it to be completely useles in our tasks, no re-use so to say.

If you could add one feature to the tutorials, what would that be? (For example: Visual feedback, UI, Progression tracking, etc?)

Ability to make notes in to the tutorial so those can be reviewed and be used to make tutorial better. Also feedback after you've done part right would be great.

Responses cannot be edited

Shadwen Editor Tutorial Questionnaire

A brief questionnaire about your learning experience with the Shadwen Editor Tutorials. The information gathered will be used in the Bachelor's Thesis work of Emma Valkki.

You can also use finnish language while answering the questions if that is more convenient to you. The answers will be translated by the author if they are quoted in the thesis work.

Have you used any other game engines before looking into the Shadwen editor?

- ○ Nope
- ◉ Yes

If yes, which ones have you used?

- ☐ Unity
- ☑ Unreal Development Kit (UDK)
- ☐ Unreal Engine 4 (UE4)
- ☐ CryEngine
- ☐ GameMaker: Studio
- ☐ I haven't used any game engines before in my life.
- ☑ Other: Marmoset Toolbag 1 & 2

How have you studied their use?

- [x] Video tutorials
- [ ] Articles
- [ ] Official documentation/Wiki pages
- [ ] With the help of community and forums
- [x] Just by exploring the editor by myself
- [ ] Via playable tutorials
- [ ] I haven't used any game engines before in my life.

How do you prefer to learn new programs?

- [ ] Via text & picture tutorials
- [x] Via watching videos tutorials
- [ ] Via trial and error by myself
- [ ] With the help of a teacher/tutor

After you played through the Shadwen tutorial levels do you feel that you have a good idea of how the levels are constructed?

- (●) Yes
- ( ) No

Which level took you the longest time to complete?

Hinge joints

Which subject would you like to learn more about? Why?

Olen level artista hyvin kiinnostunut, joten sitä haluan opiskella koko ajan lisää.

Did learning the Shadwen editor feel easy?

- ○ Yes, it was easy!
- ◉ It was ok. Not too Easy. Not too hard.
- ○ No it didn't.

Do you feel that “the books” provided you with all the needed information to complete the given tasks?

Suurimman osan ajasta ne tarjosivat riittävän informaation. Muutaman kerran piti silti katsoa wikistä video tutoriaalia, jotta pääsin eteenpäin.

Were the instructions easy to follow? Did you have any problems, if so what kind of problems?

Välillä piti lukea tekstejä useampaan kertaan, jotta ymmärsin asian. Mutta johtuu tod näk lievästä lukihäiriöstä.

Was it always clear to you when you had completed the given task?

- ○ Yes, it was always clear.
- ◉ Yes, most of the time.
- ○ Seldomly.
- ○ No it wasn't.

Did you use the Frozenbyte Wiki while working on the tutorial tasks?

- (●) Yes
- ( ) No

How often did you use the Wiki?

- ( ) With every level.
- (●) With some of the more difficult levels.
- ( ) Not at all.

Did you have any problems using the Wiki? If so, what kind of problems?

Ei ongelmia.

What was the most difficult subject to approach and why?

Hinge joints oli minulle vaikein. Isompi maailmanpyörä ei toiminut aluksi millään.

If you could add one feature to the tutorials, what would that be? (For example: Visual feedback, UI, Progression tracking, etc?)

progression tracking voisi olla hyvä lisä

Responses cannot be edited

Shadwen Editor Tutorial Questionnaire

A brief questionnaire about your learning experience with the Shadwen Editor Tutorials. The information gathered will be used in the Bachelor's Thesis work of Emma Valkki.

You can also use finnish language while answering the questions if that is more convenient to you. The answers will be translated by the author if they are quoted in the thesis work.

Have you used any other game engines before looking into the Shadwen editor?

- ○ Nope
- ◉ Yes

If yes, which ones have you used?

- ☑ Unity
- ☐ Unreal Development Kit (UDK)
- ☑ Unreal Engine 4 (UE4)
- ☐ CryEngine
- ☑ GameMaker: Studio
- ☐ I haven't used any game engines before in my life.
- ☐ Other: _____

How have you studied their use?

- [ ] Video tutorials
- [ ] Articles
- [x] Official documentation/Wiki pages
- [x] With the help of community and forums
- [x] Just by exploring the editor by myself
- [ ] Via playable tutorials
- [ ] I haven't used any game engines before in my life.

How do you prefer to learn new programs?

- [x] Via text & picture tutorials
- [ ] Via watching videos tutorials
- [ ] Via trial and error by myself
- [x] With the help of a teacher/tutor

After you played through the Shadwen tutorial levels do you feel that you have a good idea of how the levels are constructed?

- (●) Yes
- ( ) No

Which level took you the longest time to complete?

A.I. -tutorial

Which subject would you like to learn more about? Why?

Lighting, art asset use and level art in general. More learning material covering artistic aspects would be useful since the tutorials are also used to train level artists.

Did learning the Shadwen editor feel easy?

- (●) Yes, it was easy!
- ( ) It was ok. Not too Easy. Not too hard.
- ( ) No it didn't.

Do you feel that “the books” provided you with all the needed information to complete the given tasks?

I think the books provided most of the information needed, but they were a bit tedious to use as the information was often scattered over multiple books.

Were the instructions easy to follow? Did you have any problems, if so what kind of problems?

The instructions were easy enough to follow, but the information itself felt too gated behind the BookEntitys. Running between the books became a menial task so I used the wiki whenever possible.

Was it always clear to you when you had completed the given task?

- ( ) Yes, it was always clear.
- (●) Yes, most of the time.
- ( ) Seldomly.
- ( ) No it wasn't.

Did you use the Frozenbyte Wiki while working on the tutorial tasks?

- (●) Yes
- ( ) No

How often did you use the Wiki?

- ( ) With every level.
- (●) With some of the more difficult levels.
- ( ) Not at all.

Did you have any problems using the Wiki? If so, what kind of problems?

No, I don't recall any problems using the wiki.

What was the most difficult subject to approach and why?

The tutorial dealing with items and crafting was a bit confusing at first, but that was mostly because i wasn't really familiar with shawden gameplay mechanics.

If you could add one feature to the tutorials, what would that be? (For example: Visual feedback, UI, Progression tracking, etc?)

More easily accessible instructions. The text could for example float above the books in world space, even in editor view. Integrating some pictures and even video perhaps in the tutorial itself might be useful.

Responses cannot be edited

Shadwen Editor Tutorial Questionnaire

A brief questionnaire about your learning experience with the Shadwen Editor Tutorials. The information gathered will be used in the Bachelor's Thesis work of Emma Valkki.

You can also use finnish language while answering the questions if that is more convenient to you. The answers will be translated by the author if they are quoted in the thesis work.

Have you used any other game engines before looking into the Shadwen editor?

- ○ Nope
- ◉ Yes

If yes, which ones have you used?

- ☑ Unity
- ☐ Unreal Development Kit (UDK)
- ☑ Unreal Engine 4 (UE4)
- ☐ CryEngine
- ☐ GameMaker: Studio
- ☐ I haven't used any game engines before in my life.
- ☐ Other: _____

How have you studied their use?

- [x] Video tutorials
- [ ] Articles
- [x] Official documentation/Wiki pages
- [x] With the help of community and forums
- [ ] Just by exploring the editor by myself
- [ ] Via playable tutorials
- [ ] I haven't used any game engines before in my life.

How do you prefer to learn new programs?

- [x] Via text & picture tutorials
- [x] Via watching videos tutorials
- [ ] Via trial and error by myself
- [x] With the help of a teacher/tutor

After you played through the Shadwen tutorial levels do you feel that you have a good idea of how the levels are constructed?

- (●) Yes
- ( ) No

Which level took you the longest time to complete?

The one with hinge joints.

Which subject would you like to learn more about? Why?

Hinge joints, lighting

Did learning the Shadwen editor feel easy?

- ○ Yes, it was easy!
- ◉ It was ok. Not too Easy. Not too hard.
- ○ No it didn't.

Do you feel that “the books” provided you with all the needed information to complete the given tasks?

At some points I had to use the additional wiki info and ask from other people

Were the instructions easy to follow? Did you have any problems, if so what kind of problems?

Instructions for what was wanted were clear.

Was it always clear to you when you had completed the given task?

- ○ Yes, it was always clear.
- ◉ Yes, most of the time.
- ○ Seldomly.
- ○ No it wasn't.

Did you use the Frozenbyte Wiki while working on the tutorial tasks?

- ◉ Yes
- ○ No

How often did you use the Wiki?

- ○ With every level.
- ◉ With some of the more difficult levels.
- ○ Not at all.

Did you have any problems using the Wiki? If so, what kind of problems?

No problems there.

What was the most difficult subject to approach and why?

Maybe hinge joints, because there were so many things to consider.

If you could add one feature to the tutorials, what would that be? (For example: Visual feedback, UI, Progression tracking, etc?)

Some sort of feedback maybe; when completed a task, it didn't always feel like a success because you weren't sure if what you did was enough.