

Supplementary File S1

This rubric is used to apply the Game Educational Balanced (GEB) Model to any serious game. This framework is divided into the three main sections described in this theory: Game Overview, Educational Overview and Overall Balance. Each one of these features is headed by a table which classifies the game's viability as a learning tool according to the sum of all the subsection scores. The total outcome will assign a rating of excellent, good, acceptable or insufficient. Each grading will explain the game's ability to engage the player, teach the learning contents and distribute properly the gameplay and learning experiences. The sum of the three scores will result in the final game punctuation over 100, which will qualify the learning ability.

Every main section consists of different aspects as the GEB model explains. Following this theory, each feature has a different value in the total score depending on its importance for the learning or gameplay. Anyway, every characteristic corresponds to a table with five possible ratings: excellent, good, acceptable, insufficient and bad. Each one of these paragraphs defines the elements the game must include to achieve a score. To adequately measure the game, the most appropriate description and punctuation will be chosen based on the game experience. Finally, these scores will be added together to obtain the main sections gradings.

GAME OVERVIEW

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT
The total score will correspond to the sum of the scores of its four sections.	The game has all the necessary gameplay characteristics to keep the player's intrinsic motivation constant and achieve the learning objectives.	The game has most of the gameplay characteristics needed to motivate the player to achieve the learning objectives in most of its progress.	The game has certain gameplay characteristics which can maintain the player's motivation, but these will depend on other game elements or on their personal interest to achieve the learning objectives.	The game does not include the gameplay characteristics needed to maintain the player's motivation, making it difficult to achieve the learning objectives.
PUNCTUATION	40-36	35-26	25-16	15-0

Game Mechanics

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Identify throughout the game the characteristics described as optimal to create fantasy and challenge.	The elements are found when performing all the actions in the game.	The elements are found in the relevant actions in the game progress and in some additional actions.	The elements are found in the relevant actions in the game progress.	The elements are barely found in the relevant actions in the game progress.	The elements do not appear throughout the game.
PUNCTUATION	10	8	5	2	0

Game Dynamics

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Identify throughout the game the characteristics described as optimal to create challenge and curiosity.	The elements are found when interacting with all the actions in the game.	The elements are found when interacting with the relevant actions in the game progress and in some additional actions.	The elements are found when interacting with the relevant actions in the game progress.	The elements are barely found when interacting with the relevant actions in the game progress.	The elements do not appear throughout the game.
PUNCTUATION	10	8	5	2	0

Aesthetics

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Experience throughout the game the fantasy and curiosity emotions thanks to the quality and integration of the visual and sound aspects.	The visual and sound elements generate strong emotional responses in all the game actions.	The visual and sound elements generate strong emotional responses in the relevant actions in the game progress and in some additional actions.	The visual and sound elements generate moderate emotional responses in the relevant actions in the game progress.	The visual and sound elements generate slight emotional responses in the relevant actions in the game progress.	The visual and sound elements do not generate any kind of emotional response.
PUNCTUATION	10	8	5	2	0

Technology & User Experience

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the technology and user interface for its ability to provide an audiovisually pleasant and fun experience, both in the short and long term.	The interface is audiovisually pleasant and allows both immediate control and advanced mastery in game time. The experience offers long-term and short-term choices, as well as motivating interactions.	The interface is audiovisually pleasant and allows progressive control during the game. The experience offers a variety of gameplay choices, as well as motivating interactions.	The interface is audiovisually pleasant and allows immediate control in the game. The experience offers some gameplay choices in addition to motivating interactions.	The interface is audiovisually pleasant and allows immediate control in the game. The experience offers no gameplay choices or motivating interactions.	The interface is audiovisually unpleasant and blocks the control of the game and therefore the achievement of the learning objectives.
PUNCTUATION	10	8	5	2	0

EDUCATIONAL CONTENT

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT
The total score will correspond to the sum of the scores of its two sections.	The game perfectly integrates the educational content in the playful context. The learning experience is very attractive, realistic and customizable. It adapts to each user and allows to consolidate the acquired skills.	The game effectively integrates the educational content in the playful context. The learning experience is attractive and relatively customized to each user. It allows certain ways to consolidate the acquired skills.	The game mixes educational and playful content without achieving its full integration. The learning experience is relatively entertaining and can offer different options to each user. There would be required more ways to consolidate the acquired skills.	The game mixes educational and playful content creating dissonance in the user. The learning experience is not very entertaining and hardly offers options to each user. There would be required more ways to consolidate the acquired skills.
PUNCTUATION	40-36	35-26	25-16	15-0

Instructional Strategies

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the introduction and association of the educational content in relation to the gameplay and the narrative.	Conflicts in the game require acquiring skills to solve them and use competition as a motivation. The game genre is not associated with instruction and social learning is approached indirectly through abstraction. Playful messages far outnumber educational messages.	Conflicts in the game require acquiring skills to solve them. The game genre is not associated with instruction and social learning is approached indirectly through abstraction. Playful messages are more numerous than educational messages.	Conflicts in the game require acquiring skills to solve them. The game genre can be associated in part with instructional methods. Playful messages are just as numerous as educational messages.	Conflicts in the game do not require compulsory acquisition of skills to solve them. The game genre can be associated in part with instructional methods. Playful messages are less numerous than educational messages.	Conflicts in the game do not require compulsory acquisition of skills to solve them. The game genre is fully associated with instructional methods. Playful messages have little representation compared to educational messages.
PUNCTUATION	10	8	5	2	0

Backstory & Production

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the narrative elements which offer an attractive experience while integrate the learning content.	The game follows an interesting plot with the learning contents integrated through the abstraction of conflicts. The user has the ability to completely choose the story's development.	The game follows an interesting plot with the learning contents integrated in it. The user has the ability to choose various pathways in the story's development.	The game follows an interesting plot with most of the learning contents integrated in it. The user has the ability to choose at certain moments in the story's development.	The game follows an uninteresting plot, with most of the learning contents unrelated to it. The user does not have the ability to choose at any time in the story's development.	The game follows a boring plot with the learning contents totally unrelated to it. The user does not have the ability to choose at any time in the story's development.
PUNCTUATION	6	5	3	1	0

Realism

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the gameplay fidelity in relation to the real world and the learning content the player must acquire.	The game elements bear a strong resemblance to their representations in reality. The user can customize their avatar with their own image. Non-player characters use their voices and facial expressions to communicate all the time and also adopt roles.	The game elements bear a strong resemblance to their representations in reality. The user can customize their avatar with a wide variety of accessories. Non-player characters use facial expressions to communicate all the time and also adopt roles.	The game elements resemble their representations in reality. The user can customize their avatar with a variety of accessories. Non-player characters use different expressions during interactions and also adopt roles.	The game elements bear little resemblance to their representations in reality. The user cannot customize their avatar. Non-player characters show few expressions during interactions.	The game elements have no resemblance to their representations in reality. The user cannot customize their avatar. Non-player characters do not show different expressions during interactions.
PUNCTUATION	6	5	3	1	0

AI & Adaptivity

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the game adaptability to the actions of each user.	The AI records the behavior of each user to guide them through the game and consequently adapts the difficulty. The non-player characters reactions also vary in relation to the registered data.	The game offers a guide available and the possibility to change the difficulty at all times. The non-player characters reactions vary in relation to certain user actions.	The game offers the necessary guidance during difficult actions to complete. Some non-player characters reactions vary according to the user development.	The game offers the necessary guidance during difficult actions to complete. No non-player characters reactions vary according to the user development.	The game does not offer any guidance. No non-player characters reactions vary according to the user development.
PUNCTUATION	6	5	3	1	0

Interaction

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the possibilities offered by the interface to interact with the game and with other users.	The interface is easy to understand and learn to control, including a tutorial. The interaction is progressively complicated through the game. The game allows communication between players by voice or chat.	The interface is easy to understand and learn to control, including a tutorial. The interaction is progressively complicated through the game.	The interface is easy to understand and learn to control, including a tutorial.	The interface is not explained in-game and may cause interaction problems to the user.	The interface is difficult to understand and to learn to control.
PUNCTUATION	6	5	3	1	0

Feedback & Debriefing

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the game possibilities of its educational context to receive feedback and strengthen the acquired knowledge.	In-game interactions offer immediate rewards and are recorded for later reasoning during an informative session which is held after the game to consolidate learning. The teacher can support the educational actions in the game through an avatar.	In-game interactions offer immediate rewards. An informative session is held after the game to consolidate learning. The teacher can support the educational actions in the game in person during the experience.	In-game interactions offer immediate rewards. An informative session is held after the game to consolidate learning. The teacher is not present during the experience.	In-game interactions offer immediate rewards. There is no informative session after the game. The teacher is not present during the experience.	In-game interactions offer no rewards. There is no informative session after the game. The teacher is not present during the experience.
PUNCTUATION	6	5	3	1	0

OVERALL BALANCE

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT
The total score will correspond to the sum of the scores of its two sections.	The experience is very attractive and fully corresponds to the proposed learning. The distribution of the educational content is perfectly integrated with the gameplay.	The experience is attractive and the proposed learning is effectively assimilated. The distribution of the educational content is properly integrated with the gameplay.	The experience is relatively attractive and part of the proposed learning is assimilated. The distribution of the educational content is not effectively integrated with the gameplay.	The experience is not very attractive and the proposed learning is not assimilated. The distribution of the educational content is not effectively integrated with the gameplay.
PUNCTUATION	20-18	17-13	12-9	8-0

Learning & Fun Balance

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the balance between the learning obtained and the fun experienced.	The experience provides enjoyment in all interactions, as well as the acquisition of all the proposed skills. The distribution of the educational content and the difficulty progression are adapted to the required playing time.	The experience is attractive in most interactions and allows to acquire a large part of the proposed skills. The distribution of the educational content and the difficulty progression are fairly evenly adapted to the required playing time.	The experience is quite attractive and allows to acquire part of the proposed skills. The distribution of the educational content and the difficulty progression are adapted unequally to the required playing time.	The experience is relatively attractive and allows to acquire some of the proposed skills. The distribution of the educational content and the difficulty progression are adapted unequally to the required playing time.	The experience is not attractive and does not allow to acquire any of the proposed skills. The distribution of the educational content and the difficulty progression are adapted very unequally to the required playing time.
PUNCTUATION	10	8	5	2	0

Can Learn vs. Must Learn

EVALUATION CRITERIA	EXCELLENT	GOOD	ACCEPTABLE	INSUFFICIENT	BAD
Evaluate the balance between compulsory and complementary learning and its integration into the game.	The compulsory contents are in proportion to the complementary ones. Compulsory learning is integrated with the relevant actions in the game progress. Complementary learning is integrated with the exploration possibilities in the game.	The compulsory contents are less numerous than the complementary ones. Compulsory learning is integrated with relevant actions in the game progress. Complementary learning is integrated with the exploration possibilities in the game.	The compulsory contents are less numerous than the complementary ones. Compulsory and complementary learning is integrated with different actions and possibilities of game exploration.	There is a great disproportion between compulsory and complementary contents, or the latter ones disappear. Compulsory and complementary learning is integrated with different actions and possibilities of game exploration.	There is a great disproportion between compulsory and complementary contents, or the latter ones disappear. Compulsory learning is not integrated with any relevant action in the game progress.
PUNCTUATION	10	8	5	2	0