

Evaluation of Hellblade: Senua's Sacrifice on a 2D-screen

The metric developed in this manuscript and described in Appendix A was applied to the 2D-devices version of Hellblade: Senua's Sacrifice. This game tells the journey of Celtic warrior Senua to the underworld of Viking mythology to rescue the soul of her beloved Dillion. The player has to control Senua while she suffers the effects of psychosis, experiencing hallucinations and delirium. The game transmits these experiences through visual effects which form the puzzles that must be solved to move forward in the story. In addition, the user listens to the voices that surround Senua talking to her: ridiculing or encouraging her and giving ideas to progress with the game. In this way, the player becomes acquainted with Senua's story and the difficulties she suffers, how she has been removed from society, due to her illness because she can't distinguish real from imaginary facts. Throughout the game, Senua has to cross hell while finding Norse totems which explain Viking mythology. Along the way she will also find enemies that she must defeat to avoid succumbing to the darkness of psychosis.

The scores are shown in the following table. The Evaluation section explains the elements of each feature that were found in the game and the basis on which specific scores were awarded from the range of scores that the metric offers for each feature.

Playability emotion	MDA layer	Features	Evaluation	Punctuation
Challenge	Mechanics	Levels, points, goals, quests.	Throughout the game, the player has to move around the environment to advance in the story. At important points, there are some goals and missions, which have to be accomplished to move on. Nevertheless, there are no other items to earn during the experience such as points for experience or user levels.	5/10
	Dynamics	Time and enemy patterns, opponent players.	Throughout the main quests that Senua vows to undertake, there are some enemies she has to defeat before she can move on. The opponents have different attack patterns, but once the player has gained some familiarity with the game, these patterns become a bit repetitive and no longer generate constant engagement.	5/10
Fantasy	Mechanics	Rewards, badges, virtual items, feedback.	Throughout the game, there are some Norse stone totems that can be found and with which the player can interact to learn about the mythology of the game. However, these items are few and far between and finding them is not obligatory to move on.	3/10

	Aesthetics	Audio and visual effects regarding love, beauty, delight, and surprise.	The remarkable quality of the audiovisual effects of Hellblade deserve scores within the highest range. The environment that is created has the ability to immerse the player in the action, the details and attractiveness of which can be surprising.	7/10
Curiosity	Dynamics	Reward scheduling, progressive unlock, and appointments.	The quests that appear throughout the game are mainly puzzles that can only be unlocked if Senua uses her skills. Progressive difficulty and resolution are the main elements that enhance the attractiveness of the story.	7/10
	Aesthetics	Audio and visual effects regarding thrill, envy, connection, and comedy.	The remarkable quality of the audiovisual effects of Hellblade deserve to be scored within the highest range. The environment is specially designed to thrill the player and create a connection with Senua, increasing the emotion of curiosity.	8/10
SUBTOTAL				35/60
UX element	Term-time	Features	Evaluation	Punctuation
Motivation	Short-term	Initial attraction to play.	Hellblade presents an interesting environment from the start, with a narrative and effects that invite the player to explore the game and its simple interface facilitates gameplay. It therefore awakens a very strong immediate attraction.	4/4
	Long-term	Available rewards during the game.	Throughout the game, there are only a few totems that can be unlocked.	1/4
Meaningful choices	Short-term	Player's possible tactics.	The puzzles gameplay is based on the immediate tactics that the player must perform to continue progressing in the game.	4/4
	Long-term	Player's possible strategies.	The game offers no strategy, decision or skill of any kind to be accomplished in the long term.	0/4
Usability	Short-term	Sense of control since the beginning.	The interface is relatively simple to learn and to control, but the game offers no explanation of the objectives or interactions.	2/4
	Long-term	Possibility of mastering the interface.	The interface remains simple throughout the game so it can be mastered. Nevertheless, the interactions become more difficult to allow the player to gain control over it.	3/4

Aesthetics	Short-term	Pleasant direct sensory experience.	The audiovisual effects of the environment and the interface are quite pleasant when the game starts.	3/4
	Long-term	Pleasant experience throughout the game.	Although the audiovisual effects remain pleasant throughout the game, these become a bit repetitive.	2/4
Balance	Short-term	Basic game interactions are quickly learnt.	The interactions are quite easy to learn. The game would only need a tutorial to avoid any potential issues with novice players.	3/4
	Long-term	Player's progress affects the interface.	As the player progresses through the game, some of the interactions with puzzles and enemies become more complicated.	2/4
SUBTOTAL				24/40

Evaluation of Hellblade: Senua's Sacrifice in virtual reality (VR)

The following table shows the punctuations of applying the developed metric to the Hellblade's version in virtual reality. Some layers may coincide with the 2D version; however, the Evaluation section has been applied and explained considering the special VR features described in this article and pointing out the differences.

Playability emotion	MDA layer	VR Features	Evaluation	Punctuation
Challenge	Mechanics	Levels, points, goals, quests.	Throughout the game, the player has to move around the environment to advance in the story. At important points, there are some goals and missions, which have to be accomplished to move on. Nevertheless, there are no other items to earn during the experience such as points for experience or user levels.	5/10
	Dynamics	Time and enemy patterns, opponent players.	Throughout the main quests that Senua vows to undertake, there are some enemies she has to defeat before she can move on. The opponents have different attack	5/10

			patterns, but once the player has gained some familiarity with the game, these patterns become a bit repetitive and no longer generate constant engagement.	
Fantasy	Mechanics	Rewards, badges, virtual items, feedback.	Throughout the game, there are some Norse stone totems that can be found and with which the player can interact to learn about the mythology of the game. However, these items are few and far between and finding them is not obligatory to move on.	1/5
		<i>These are interactive and integrated in the environment or not.</i>	The totems are integrated into the environment and the player can move around them while interacting, although no other sort of contact with them is possible.	2/5
	Aesthetics	Audio and visual effects regarding love, beauty, delight, and surprise.	The remarkable quality of the audiovisual effects of Hellblade deserve scores within the highest range. The environment that is created has the ability to immerse the player in the action, the details and attractiveness of which can be surprising.	5/5
		<i>The sense of surrounding intensifies the emotion.</i>	The VR environment permits perfect immersion in the fantasy world to generate very strong emotions.	5/5
Curiosity	Dynamics	Reward scheduling, progressive unlock, and appointments.	The quests that appear throughout the game are mainly puzzles that can only be unlocked if Senua uses her skills. Progressive difficulty and resolution are the main elements that enhance the attractiveness of the story.	4/5
		<i>These are interactive and can be explored or not.</i>	The VR environment permits more direct interaction and exploration when solving the puzzles.	4/5
	Aesthetics	Audio and visual effects regarding thrill, envy, connection, and comedy.	The remarkable quality of the audiovisual effects of Hellblade deserve to be scored within the highest range. The environment that is created has the ability to immerse the player in the action, the details and attractiveness of which can be surprising.	5/5
		<i>The sense of interaction intensifies the emotion.</i>	VR environment allows a good interaction and approach to the items to generate very strong emotions.	5/5
SUBTOTAL				41/60
UX element	Term-time	VR Features	Evaluation	Punctuation

Motivation	Short-term	Initial attraction to play.	Hellblade presents an interesting environment from the beginning, with an inviting narrative and effects that player wishes to explore, as well as a simple interface that facilitates further exploration. It therefore awakens a very strong immediate attraction.	4/4
	Long-term	Available rewards during the game. <i>The device and controllers allow the interaction.</i>	Throughout the game, there are only a few totems that offer the possibility of being unlocked and moving around them in the VR environment.	1/4
Meaningful choices	Short-term	Possible player tactics. <i>The device and controllers allow the interaction.</i>	The puzzles gameplay is based on the immediate tactics that the player must perform to continue progressing in the game. These are completely interactive through the VR device and controllers.	4/4
	Long-term	Possible player strategies.	The game offers no kind of strategy, decision or skill to be accomplished in the long term.	0/4
Usability	Short-term	Sense of control since the beginning. <i>There are no complex actions necessary to play.</i>	The VR interface is relatively simple to learn and control, but the game does not offer any explanation of the objectives or interactions.	2/4
	Long-term	Possibility of mastering the interface. <i>No dizziness or headaches caused.</i>	The interface remains simple throughout the game so it can be mastered. Nevertheless, the interactions become more difficult to allow the player to gain control over it. Hellblade is well adapted, so it does not cause dizziness or headaches.	3/4
Aesthetics	Short-term	Pleasant direct sensory experience.	The audiovisual effects of the VR environment and the VR interface are really pleasant when the game starts.	4/4
	Long-term	Pleasant experience throughout the game. <i>Budget limitations taken into account.</i>	Although the audiovisual VR effects remain very pleasant throughout the game, these end up being a bit repetitive. This AAA game has no budget limitations.	3/4
Balance	Short-term	Basic game interactions are quickly learnt. <i>There is a tutorial.</i>	The interactions are quite easy to learn. The game would only need a tutorial to avoid any potential issues with novice players and VR users.	3/4
	Long-term	The progress of the player affects the interface.	As the player progresses through the game, some of the interactions with puzzles and enemies become more complicated.	2/4
SUBTOTAL				26/40

