ATMSG analysis

DragonBox Algebra 5+

Producer: WeWantToKnow
Release year: 2012
Platform(s): PC, iOS, Android
URL: http://dragonboxapp.com/
Description: *DragonBox Algebra 5+* is a critically acclaimed and commercially successful videogame for teaching algebra concepts to young children.

Figure 1. The title screen of DragonBox Algebra 5+

Step I – Activities description

Activity	Subject	Description
Gaming	Children aged 5-12	The objective of the game is solving a series of puzzles to be able to feed the dragon and watch it grow. To pass each level, the player must manipulate the tiles until the Dragonbox is alone on one side of the game board. The graphics, music and rewards are similar to other apps and games typically targeted at the same age group, keeping it familiar and fun.
Learning	Children aged 5-12	The puzzles to be solved in the game are in fact algebraic equations that must be solved for an unknown variable, represented by the Dragonbox. The graphical icons are progressively replaced by numbers and variables. Typically, there is no conscious motivation for the learning activity.
Intrinsic instruction	WeWantToKnow	The game aims to introduce the basic concepts of algebra in a fun way. It tries to remove the negativity surrounding the topic by making it as simple as possible to understand.

Figure 2. Tiles have to be combined and moved to solve the puzzles.
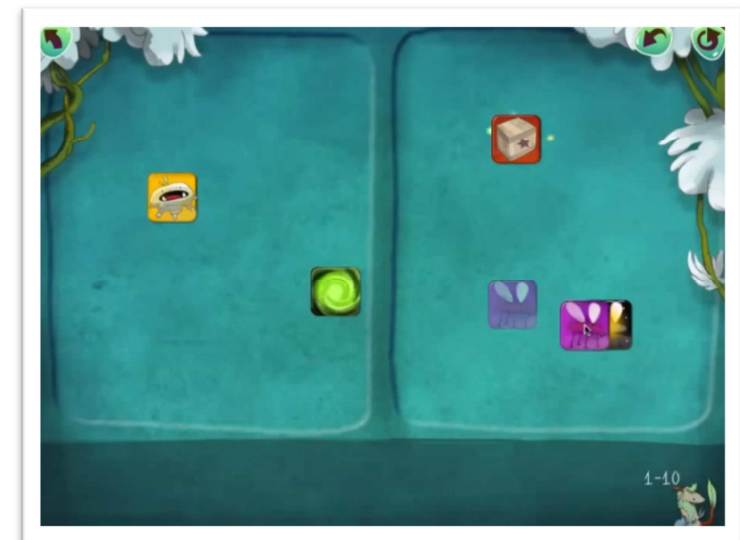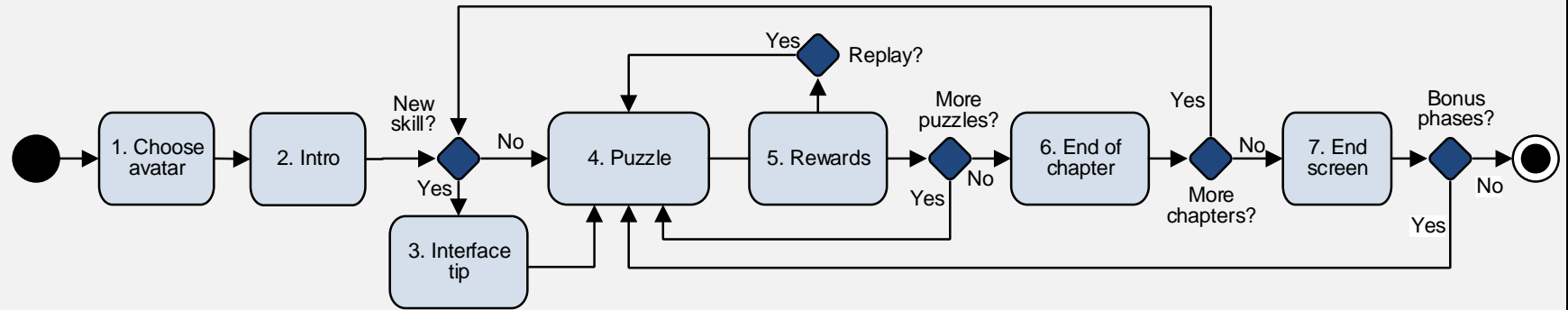
Steps II & III – Game sequence and SG elements

		1. Choose avatar	2. Intro	3. Interface tip	4. Puzzle	5. Rewards	6. End of chapter	7. End screen
Gaming	**Actions**	Customization	Watch	Obtain help	Matching	See performance evaluation	See performance evaluation	
	Tools	Avatar	Information	Tutorial	Tiles; Performance Meter; Warning messages	Rewards; Performance meter	Rewards; Levels	
	Goals	Configure game	Learn UI	Learn UI	Solve puzzle; Maximize performance	Maximize performance	Maximize performance	
Learning	**Actions**			Observe	Repetition; Imitating; Experimenting	Verifying/ reviewing		
	Tools			Tips	Challenge	Report		
	Goals			Remembering	Remembering	Understanding		
Intrinsic Instruction	**Actions**			Demonstrating	Scaffolding; Repetition; Recover from errors	Quantitatively assessing performance; Rewarding good performance		
	Tools			Tips	Challenge; Multiple Chances; Limited set of choices	Performance measures		
	Goals			Providing learning guidance	Eliciting performance, confidence	Providing feedback; Assessing performance		

Step IV – Details of the implementation

Game sequence node	Gaming	Learning	Intrinsic Instruction
1. Choose avatar	The player finds a character that pleases her to be her avatar. The avatar is not used anywhere else in the game.	-	-
2. Introduction	A short animation explains the basic objectives and rules of the game before the start.	-	-
3. Interface tip	If there is a new skill ("power") needed to solve the puzzle, the game shows an animation explaining the allowed movements.	The game conveys the rules of algebra in a hidden way, with short interface tips that demonstrate the allowed movements.	Demonstration is used instead of verbose explanation, using simple tips to provide the guidance that the player needs to solve the puzzles.
4. Puzzle	The player has to move and combine the tiles to isolate the Dragonbox in one side, using as few movements as possible. The interface forces the player to follow the rules. The player can play the same puzzle as many times as she wants.	Puzzle after puzzle, the player has to repeat the same patterns until they become automatic. Experimenting with the rules is encouraged, as the interface forces the correct balancing of the equation.	The complexity of the puzzles increases very gradually. The necessary skills are accumulated over the levels. The interface prevents the player from making mistakes, which avoids frustration and increases the player's confidence.
5. Rewards	After completing the puzzle, the player earns stars for each possible achievement. Extra points are given when the puzzle is solved in the fewer number of movements possible and when no extra elements are left in the board.	It is not possible to give wrong answers in the puzzle, but the player can earn extra points for eliminating extra pieces and using fewer movements. The player can repeat the level to achieve a better score with no penalties.	The assessment of the player's performance gives feedback on which rules were not completely followed and elicits the player to try again.
6. End of chapter	A screen showing the full-grown dragon marks the end of the level. A player can share her achievements in different social networks.	-	-
7. End screen	When all levels have been completed, the player is invited to play the bonus stages, which feature algebraic equations in proper mathematical notation.	-	-