

Dimensions	Heuristics	
Game general design	1.1	Exploit metaphors from real-life games, activities, stories
	1.2	Minimize the changes to the physical places (e.g. modifications to the physical structure, installation of special equipment like projectors, big displays, etc.)
	1.3	Create a multidisciplinary design team (including e.g. HCI, cultural heritage, educational experts)
	1.4	Perform formative evaluations and pilot studies to check if tasks' difficulty is appropriate for the intended players
	1.5	Consider the social conventions of the place (e.g. not laughing in a church)
	1.6	Consider to extend the game experience beyond the game session (e.g. participating in a web community)
	1.7	Consider to include activities/events that are not part of the game, but happen in the real world (e.g. the ceremony of change of the guard at noon)
	1.8	Consider to include a game master (e.g. tutor, supervisor, coordinator) and her role: e.g. enforcing the rules, narrating the story
Control / flexibility	2.1	Let players become familiar with the equipment and the game rules/structure (e.g. by including an introductory phase)
	2.2	Facilitate game learnability (i.e. tasks, rules, constraints, etc. should be easy to understand and to learn)
	2.3	Player should be free to switch between different tasks
	2.4	Reflect on whether to allow players to correct their mistakes: it could be useful to force them to evaluate the consequences of their actions
	2.5	Provide help or hint mechanisms to assist players
	2.6	Consider to provide increasing difficulty levels (either automatic adaptation or human-generated adaptation)
	2.7	Prevent rule breaking by either discouraging it (e.g. with penalties) or by incorporating cheating into the game
	2.8	Make clear the game goal/s (e.g. earning points, completing tasks, being the winner)
	2.9	Make clear the game ending condition/s (e.g. maximum time, target score, end of resources, ...)
	2.10	Consider to provide alternative ways for performing a task or completing the game
	2.11	Make clear the goal of each task and its effects on the overall game
	2.12	Provide immediate feedback about task execution showing its impact on the overall game

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Engagement	3.1	Consider to integrate a back-story that is at the basis of game tasks
	3.2	Consider to exploit role-playing (i.e. impersonating a character) to meaningfully link tasks to the back-story (if any)
	3.3	Provide contextual cues linked to specific places or events to convey additional information (e.g. sounds reproducing noises of daily activities in an ancient city)
	3.4	Consider to allow players to interfere to competitors, e.g. stealing/acquiring points
	3.5	Let players practice different skills by including in the game a variety of tasks, such as: perform a quest, identify/visit certain locations, shoot a picture from a specific angle, videotape a route, search for a certain object, perform a certain action/gesture, search/identify a physical mark, answer a question, collect and classifying material
	3.6	Minimize the interaction with the game tools. Players' attention should be focused on the game and the environment
	3.7	Tune the level of awareness of other players' activities (hide/provide/delay information, e.g. showing the score and the progress of the competitors)
	3.8	Consider to include rewards in order to improve players' motivation/satisfaction (e.g. providing multimedia information as a prize for a successful task); integrate rewards tightly with the game tasks and back-story; consider when to provide the rewards to the players (during/after the game)
Educational aspects	4.1	Consider to include a pre-game activity to prepare players (e.g. some lessons in classroom explaining the historical context in which the game is set)
	4.2	Game should emphasize either vertical or horizontal exploration of a place/topic, i.e., deeply exploring a limited space (or few objects or a specific topic) vs. more superficially exploring a broad space (or many objects or several topics)
	4.3	Tasks should require players to link areas, locations, physical objects to concepts, topics, etc.
	4.4	Balance between competition and knowledge acquisition. Too much competition may have a negative impact on knowledge acquisition
	4.5	Include a debriefing phase after the game to allow players to reflect on the game experience. Design it as an individual/collaborative game/activity that supports players to clarify and consolidate the game experience
Social aspects	5.1	Team players (if any) should be selected based on players' social relations (e.g. friends to maximize collaboration) or according to their skills. Involve in this process a person that knows them very well (e.g. a teacher)
	5.2	Assign responsibilities and tools (e.g. mobile devices, maps, etc.) among team members to induce collaboration. Consider to force, forbid or allow responsibilities exchange among team members
	5.3	Consider to permit, force or neglect the competition among players/teams