RUBRIC FOR ASSESSING OR DESIGNING DIGITAL PLAYFUL LEARNING SPACES

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RATIONALE

Young people today, particularly children and teenagers, love playing games and are fluent in the use of digital playspaces. There are growing numbers of digital games, many with uncertain educational value. The potential for educational use of digital play spaces is an area yet to be explored in the home, in the school and in the corporate setting. Identifying and assessing the value of digital playful learning spaces is a starting point for this exploration. The next step will be to learn how to use these devices in the appropriate setting.

INTENDED USERS

This rubric is intended to be used by decision makers involved with digital and playful learning spaces. This group could include those who want to buy and use digital spaces for educational purposes (parents, teachers, corporations) and those who want to design and build digital playspaces for learning (educators, developers, strategists).

CONTEXTUAL ASPECTS

This document is not a recipe to be applied uniformly to all digital playspaces, nor is it intended to meet all the learning needs of any type of learner. Because of this, it is recommended that the following points be clarified before presenting the procedures, components, variables and other aspects of this work.

The following are adapted from a prior work on Children's software evaluation [1]:

- **What kinds of software and hardware are necessary for using a digital playspace?** Is it software to be used on a computer (desktop/laptop, or handheld computer), a hardware cartridge to be used in a digital device, or a service to be offered through the net? Is it a mono-user or multi-user digital playspace? Does it require special interfaces (e.g., sensors, cameras, plotters, game terminals,…)? A knowledge of these characteristics makes it possible to examine the *viability* and *practicality* of using the digital playspace in the desired educational setting (home, school, or work).
- **What is the intended educational purpose of the digital playspace?** What educational promises do authors and sellers make? What educational value is the evaluator seeking (e.g., software to promote creativity, to learn a particular skill, or to develop a certain attitude...)?

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Having clear answers to the above questions allows an immediate analysis of the *pertinence* of the digital space and, later on, its *consistency*, *congruence*, and *completeness* as measured against the appropriate educational principles and strategies.

- **Who is the audience or the target population?** Is this software intended for children, teenagers, young adults, adults, some of them, or all of them? Are people with special needs (hearing impaired, illiterate, foreign language speakers…) included? Is gender an issue or a selection criteria that must be considered? Is it designed to be used individually, in small groups, on the same console, or in small groups on individual machines? Answers to this set of questions will help analyze the *relevance*, *significance*, and *adequacy* of the different components of the digital playspace to the target audience.
- **What theoretical orientation is brought to the digital space evaluation process?** Every educational perspective has its champions concerning the kind of digital playspaces worth using. There are excellent digital playspaces applying constructivist, behaviorist or combined psychological approaches. Depending on the educational intention, as well as on the characteristics of the audience, a *consistent* theoretical framework should be adopted.
- **Are there non-digital playspaces that help the target population achieve the intended learning goals**? What can we learn from them? Reviewing non-digital playspaces may help in supplementing digital ones. Are there other non-digital learning spaces and materials that allow the audience to achieve similar learning goals? What are the limitations of such non-digital playspaces in promoting the desired learning? What are the advantages? This contrast of digital Vs non-digital playspaces will help determine the expected *value added* by the digital dimension of the playspace.

PROCEDURES TO FOLLOW

The following is an incremental process for assessing digital playspaces that builds on relevant literature regarding playful digital spaces evaluation [2, 3].

- Obtain access to the digital playspace. This may require purchasing a copy, obtaining a free sample, asking for permission to review it or requesting an authorized password. One must also gain access to the appropriate computing and networking facilities that are connected to the digital playspace.
- Find answers to the "contextual aspects" mentioned above. Read, play, explore, analyze, reflect, and synthesize your ideas. These will give you cursory evidence concerning the viability, practicality, pertinence, relevance, significance, consistency, and value added by the digital playspace. If the balance is positive, continue with the evaluation process.
- [Optional] See if another organization has assessed the educational value of the intended digital playspace. Buckleitner [1, p.7-8] provides a list of 13 organizations that review educational software, their URLs, and the focus of their assessments. Analyze how the evaluation was done (your perspectives may not fit theirs), and their major conclusions. Based on their assessments and methodologies, you may accept or reject their recommendations.
- Try out the digital playspace with representative members of the intended audience. Let them have the experience, provide handouts, surveys or questionnaires to capture their insights, reactions, and opinions. When they are done, get feedback. Principles for digital game-based learning environments (see below) may help in interviewing the field testers. The focus of this field test is to identify the user's opinion of the digital playspace as a playful learning device. Process the data you collected and determine whether or not the balance is positive -- that is, if the users agree that this digital space is a playful learning environment.

- Make an in-depth review of the digital playspace you have selected, taking into consideration the different components, variables and aspects mentioned below. You can do this on your own or with the help of other people interested in assessing the educational value of the selected digital playspace. Different perspectives are worth considering, as they compensate for the educational biases of individual evaluators and lead to a better informed decision.

PRINCIPLES TO BE VERIFIED WITH THE SAMPLE TESTERS

The following questions reflect what Prensky [3, p. 179] considers basic aspects of digital game-based learning environments. They can be used as focal points for interviewing representative users of the digital playspace, after they have completely experienced it:

- Is this digital playspace enough fun so that someone who is not in the target audience would want to play with it and learn from it?
- Do people using it think of themselves as "players" rather than "students" or "trainees"?
- Is this experience addictive? Does it produce great "word of mouth" among users? [Do users talk about it ?]That is, do users rush out after they try it and tell their colleagues or classmates "You've got to try this – it's way cool". Do users want to play repeatedly until they finish or win, and possibly even after that?
- What can be learned with this digital playspace? Are the player's skills in the subject matter and learning content of the game -- be it knowledge, process, procedure, ability, etc – significantly improving at a rapid rate and getting better the longer he or she plays?
- Does the digital playspace encourage reflection about what has been learned?

The information you get will help determine if the digital playspace is playful and whether or not it has potential as a learning device. If this is the case, then it is beneficial to make an in-depth assessment of the software. The following criteria will help you in this regard.

COMPONENTS, VARIABLES AND OTHER ASPECTS TO CONSIDER FOR A DETAILED ASSESSMENT, OR DESIGN, OF DIGITAL PLAYSPACES AS LEARNING ENVIRONMENTS

The study of different types of digital playspaces as learning environments and of multicultural participation process around them [4, 5, 6, 7, 8, 9, 10, 11] has lead this study group to consider the following components (groups of variables) in order to conduct a systematic review of a digital playspace:

Compo-nent	Variables to observe	Aspects to be considered
Fantasy structure / micro-worlds / playspace	• argument (story) or type of stories that the user can build • challenges (posted by the system or defined by the user) • characters and their roles • tools for intervening in the playspace, • constraints or resources that can be applied to the playspace	Is the story/argument endogenous to the learning goals, or is it exogenous? Are the challenges intrinsic to the learning goals (i.e., directly related to the learning goals), or are they extrinsic (i.e,. exogenous) to the goals? What role does each of the intervening characters assume? What powers can be acquired/lost by the character representing the user as well as by other characters? Are the tools for intervening in the action curious, interesting, powerful, dynamic, varied, or fun? Is it possible to change the general conditions of the system, even if they become unreal, illogical or do not make sense?
Feedback	• Behavior of the different components of the microworld and of the intervening tools and characters • Changes of status of the playspace according to the intervention of the users	Is feedback intrinsic (inherent to the task being performed) or extrinsic (rewards or penalties given as consequence of the tasks)? Is feedback implicit (you derive it from the behavior of the system) or explicit (you are told by the system how you are doing)? Is feedback organic (you are given constant visual representation of the state of each component of the system) or responsive (feedback is given when you ask for a response)? Is “give up” or “I got it” feedback encouraging? When you give up does the system provide the answer or clues that encourage you to try again? When you get the solution, does the system encourage you to explore other solutions or to find a better solution?

Compo-nent	Variables to observe	Aspects to be considered
Sense of control	• Fantasy structure • Feedback • Sequence of action • Human computer interface • Level of performance	• What is the user's role in determining the fantasy structure? Can s/he contribute to, create or change the fantasy structure? • Does the feedback allow the user to reflect and rethink the next intervention, or does s/he just react to the action? Is controlling feedback (feedback that does not allow for reflection on the action) an issue? • Who controls the sequence: is it history driven? Menu driven? Combined? Is it a flexible sequence? • Is it possible to adjust colors, sound, music, background, speed, language? • Is it possible to change the level of difficulty of the challenges, the goal to be achieved, or the tools to be used?
Game learning curve	• Demo of the system • Tutorial of the system • Trial and error of the components and its functioning in the system • Demo of the components and their integration in the system • Help function	• Is there a demo of the playspace that captures the attention and that can be skipped after the first time? • Is there a tutorial on demand, a step by step procedure that helps users become familiar with the system, its parts and properties? • Is it possible to try new parts or components of the system before using them? Can you learn about the system from the experience? • Is it possible to get a demo or ask to see the different parts or components of the playspace? • Does the system provide clues or feedback when the users are lost or unsure of what to do next? Is this help in the form of an illumination with indirect light or a direct suggestion on what to do next?

Compo-nent	Variables to observe	Aspects to be considered
Accommodation to special needs	• Input / output devices • Information • Learning styles • Expression technologies • Collaboration and communication tools	• Does the digital space offer multiple stimuli and react to multiple devices? • Are there multiple ways of presenting, on demand, information generated by the digital space? • Is it possible to accommodate the interaction with the digital space to different learning styles? Are there multiple learning strategies available for achieving common goals? • Does technology allow the user to express his/her ideas in different ways? Does it provide multiple means for student expression? • Is it possible to synergistically communicate and collaborate with others in order to achieve common goals? • Does the digital playspace support asynchronous or synchronous interaction among peers, teachers or outsiders?
Learning opportunities	• Knowledge, abilities, skills, attitudes, … that can be learned using the digital playspace • Metaknowledge or principles about learning that can be learned • Reflection and discussion about the experience • Creativity and problem solving • Personal development • Social behavior	• What content and process knowledge, abilities, skills, attitudes can be learned? form part of the formal (e.g., to obtain a title) curriculum?, …of the non-formal (e.g., to obtain or keep a job) curriculum?…of informal (e.g. lifelong learning) curriculum? • What heuristics, rules of thumb, or general principles for problem solving can be learned using this digital playspace? • Does this digital playspace provide grounds for interesting discussions based on reflection about the playing experience? (e.g., relationship issues in The SIMS, political issues in SIMCITY, engineering problems in Contraptions..) • Does this digital playspace contribute to the development of creative ways of viewing the subject matter or the problems under consideration? • How might this digital playspace contribute to user's identity formation, self-confidence or other aspects of personal development? • Does this digital playspace encourage anti-social behavior? (e.g., egoism, violence, treachery)? • Does it encourage positive social behavior such as cooperation, team building, etc.?

Compo-nent	Variables to observe	Aspects to be considered
Formal, non-formal and informal education integra-tion	• Appropriate educational setting • Home-school connections • Information to be used by educators • Openness from the educational perspective • Educational support to users and facilitators	• In which educational setting (school, work, home) is it more natural/appropriate to use this digital space? • Is the playspace adaptable to either the classroom or computer lab? For instance, can a classroom with just two computers effectively use the playspace? • Does this playspace support home-school connections? What aspects should be shared, discussed, or shown to parents and teachers? • Does this digital space provide information to educators (teachers, trainers, or parents) concerning the user's performance and activities? • Is the digital space flexible enough so that educators can impose different goal structures or educational resources upon it? Does the playspace support standards and district curriculum for the school/grade level? • Are there resources, such as a professional development community, that would support the educational use of this digital space?

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