A Two-Dimensional Approach to Creativity Assessment for Digital Game Story Design

Yun-Hsuan HUANG[a*] & Tsung-Yen CHUANG[b]
[a*] *National University of Tainan, Taiwan*
[b] *National University of Tainan, Taiwan*
D10055003@stumail.nutn.edu.tw

Abstract: This assessment design examines the deficiencies and flaws of existing creativity measures for digital game story design. Instead of using holistic scoring simply overlooking an overall story, a two-dimensional analytic approach to creativity assessment which combines distinct game story constructs with six types of creativity indicators is proposed. Besides, creativity descriptors commonly used by educators in scoring rubrics are also been characterized to correspond to the categories of creativity indicators. This creativity assessment not only helps evaluators like teachers measure digital game story creativity, understands which aspects of the digital game story are short of creativity, but also prompts digital game story designers like students and product developers to tailor creative and entertaining game stories.

Keywords: creativity assessment, game story design, game story creativity, digital game stories

Introduction

Creativity has been explored and pursued by human beings because many masterpieces and innovations are yielded through creativity. In the digital game world, one of the crucial factors attracting and immersing digital natives into game play is the game story, as a game involving a story enriches game substance and creates a vivid sense of reality in the fancy game world. How to make a game story fascinating to draw players into a vicarious game world requires special elements. Undoubtedly, creativity is a crucial element for a game story. Thus, creativity assessment for game story design is an imperative.

1. Background, Problems and Purposes

Despite the fact that game stories, story creativity, or creativity assessment has been extensively discussed [1]-[3], scarce information specifically addresses the intersection of the three-creativity assessment of digital game stories. As game stories, unlike other types of stories such as movies and novels, possess story-game duality [6]; thus, the creativity assessment for digital game stories demands to customizably measure whether creativity in digital game stories inspires players to immerse into and interact with the fantastic game world, thereby enjoying story- and game-like entertainment. However, creativity indicators of existing measuring instruments do not adequately target digital game story creativity. Aside from the digital game industry, pedagogically, digital game design courses also need to provide useful information. To fill up this deficiency, this assessment design aims at developing a two-dimensional measure specifically for digital

game story creativity. In addition to provide useful creativity assessment for digital game stories and through it more precisely diagnose which aspects of game story design needs enhancement, this assessment design also highlights a dynamic way of inspiring creativity through game story design.

2. Literature Review

2.1 Creativity Assessment

Due to multitudes of perspectives for creativity, creativity assessment varies accordingly. According to Hocevar and Bachelor's [7] classification from more than 100 examples of creativity assessment, they inducted eight categories of creativity assessment tools. These categories are listed as follows:

Table 1
Types of Creativity Assessment Instruments

Category	Example
Tests of Divergent Thinking	Torrance Tests of Creative Thinking [4] Creativity Assessment Packet, CAP [5]
Attitude and Interest Inventories	Basadur Preference Scale [1]
Personality Inventories	Iowa Inventiveness Inventory [8]
Biographical Inventories	The Creative Achievement [9]
Rating by Teachers, Peers and Supervisors	Domino Creativity Scale, ACL [3]
Judgment of Products	Creative Product Assessment Matrix [2]
Eminence	Genius, creativity, and leadership: Historiometric enquiries [10]
Self-reported Creative Activities and Achievements	The construct of creativity: Structural model for self-reported creativity ratings [11]

Among the eight categories, most commonly adopted techniques are two: one is the Divergent Thinking approach; the other is the Consensual Assessment [12] approach which covers the method of Rating by Teachers, Peers and Supervisors and the method of Judgment of Products [7].

2.2 Creativity Indicators

Whichever creativity assessment it is, existing creativity assessments share similar creativity indicators but also label differentiated ones. For instance, the creativity indicators employed in Torrance Tests of Creativity Thinking [4] comprise fluency, flexibility, originality, average, elaboration, creativity index, abstractness of titles, and resistance to closure. The William Scale [5] for creativity thinking proposes curiosity, imagination, complexity, and risk-taking. The Pythagoras measure [13] of verbal and nonverbal creativity applies creative imitation, verbal interpretation, original production, and verbal aptitude.

Aside from the notions defined by researchers, a tremendous variety of vocabulary has been practically applied by educators to indicate creativity in scoring rubrics. Such words are like original, novel, unique, innovative, unusual, inspiring, complex,

sophisticated, fantastic, unpredictable, dramatic, interesting, surprising, intertwined, unexpected, varied, or using colorful words, imagination, vivid images, suspense, foreshadowing, climax, conflict, irony, imagery, metaphor, symbolism, simile, producing curiosity, etc. These terms will be categorized later in Figure 2.

2.3 Narrative and Story Writing Assessment

In the area of narrative and story writing assessment, myriads of assessment rubrics have been dedicated by researchers and educators. The commonly used constructs for narrative writing, story writing, or creative writing include content, knowledge and understanding, plot, organization, communication, application, word and language choice, voice, mechanics, style, originality, focus, integration, etc [14-16]. Yet, these constructs are not all effective for game stories.

3. Development of Creativity Assessment for Digital Game Stories

3.1 Problems of Existing Creativity Assessment Instruments

No matter which kind of assessment it is, none can adequately and specifically target the assessed domain-game story creativity, as game story creativity simultaneously involves the dimensions of creativity in game and story contexts.

For general creativity assessment rubrics, they lack measurement in the attributes of game contexts and story writing. For creative writing assessment rubrics, they neglect the characteristics of game contexts and narrative or story genre. For narrative or story writing assessment rubrics, they do not closely address creativity as a core, nor do they thoroughly consider some significant game essences such as virtual characters, fantastic scenes, and exciting game play. To tackle these problems, this assessment design thus devices a two-dimensional analytic rubric model to target this specific domain.

3.2 Proposed Theoretical Framework of Game Story Constructs

For the purpose of this assessment design, five game story constructs are selected as manifested in the following framework.

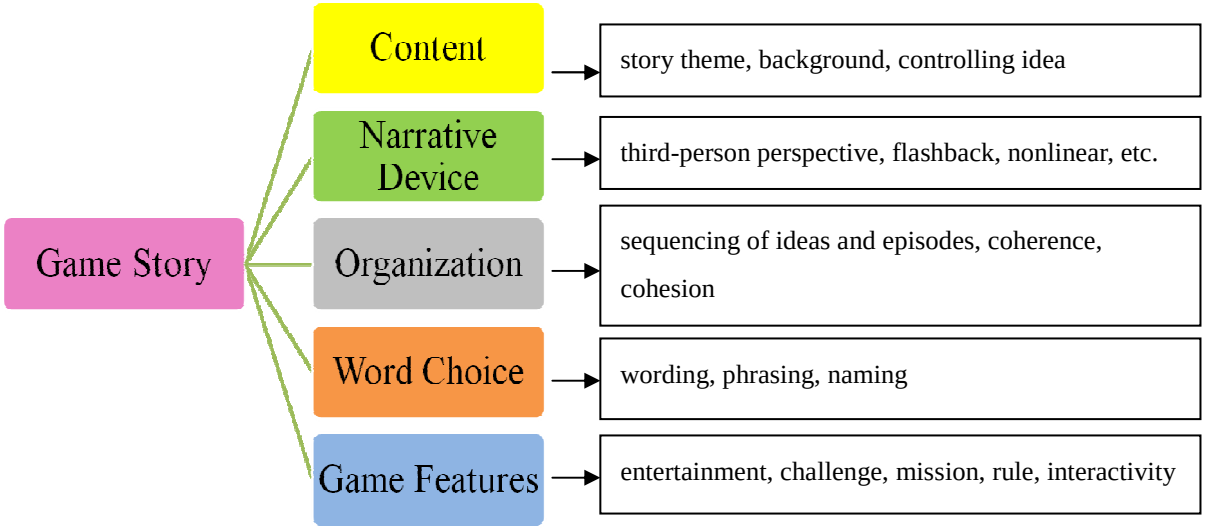

Figure 1. The theoretical framework of game stories and the statement of constructs

3.3 Proposed Creativity Indicators for Game Stories

This assessment design examines creativity in terms of the "product' dimension from Rhodes' 4P [17], and the assessment rubric generated is through the Judgment of Product technique. Six types of creativity indicators are selected: originality, complexity, imagination, flexibility, wonder and application. The more types of creativity indicators involve, the more abundance creativity presents. Besides, the aforementioned terms such as surprising, novel, imaginative applied by educators in scoring rubrics are characterized as creativity descriptors to interpret the six types of creativity indicators, which is illustrated below.

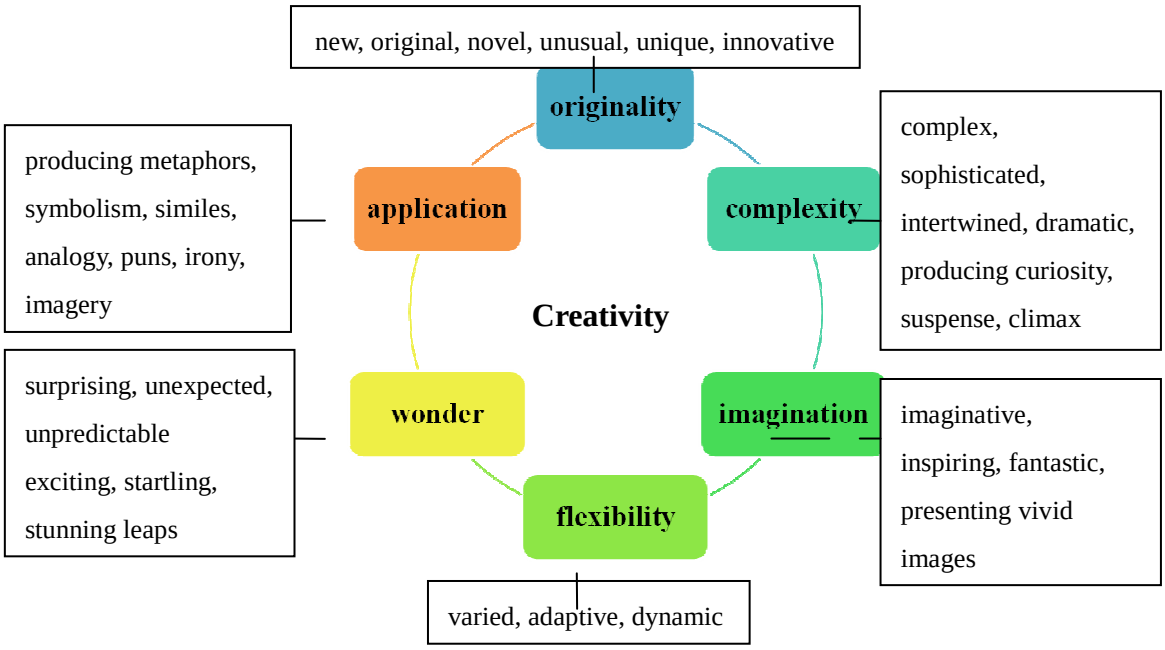

Figure 2. The framework of creativity indicators for digital game stories

3.4 The Analytic Scoring Rubric of Creativity Assessment

Based on the above frameworks, the scoring rubric is developed in the following.

Table 3
Analytic Scoring Rubric for Creativity of Digital Game Story Design

Construct		Statement of Scoring
Content	6	Proficiently applies 5-6 types of creativity indicators
	5	Skillfully applies 3-4 types of creativity indicators
	4	Adequately uses 1-2 types of creativity indicators
	3	Unskillfully practices any type of creativity indicators
	2	Uses a common story theme, background, and controlling idea
	1	Displays an unclear story theme, background, and controlling idea
Narrative Device	6	Proficient conveyance with 5-6 types of creativity indicators
	5	Tactical conveyance with 3-4 types of creativity indicators
	4	Adequate delivery with 1-2 types of creativity indicators
	3	Unskillful delivery with any type of creativity indicators
	2	Smooth use of a common narrative technique
	1	No narrative technique

Organization	6	Proficient sequencing with 5-6 types of creativity indicators
	5	Tactical sequencing with 3-4 types of creativity indicators
	4	Adequate sequencing with 1-2 types of creativity indicators
	3	Unskillful sequencing with any type of creativity indicators
	2	Ordinary sequencing of ideas and episodes
	1	Poor or confusing sequencing of ideas and episodes
Word Choice	6	Proficiently depicts with 5-6 types of creativity indicators
	5	Brilliantly applies 3-4 types of creativity indicators
	4	Appropriately portrays with 1-2 types of creativity indicators
	3	Unskillfully practices with any type of creativity indicators
	2	Shows limited ability in wording, phrasing, naming
	1	Reveals many inappropriate wording, phrasing, and naming
Game Features	6	Excellent game features with 5-6 types of creativity indicators
	5	Skillful game features with 3-4 types of creativity indicators
	4	Impressive game features with 1-2 types of creativity indicators
	3	Ordinary game features
	2	Poor game features
	1	No game feature

4. Characteristics of the Analytic Rubric

Distinct from other assessment rubrics, this two-dimensional analytic scoring rubric comprising game story constructs and creativity indicators is characterized with four traits: (1) It consists of a breakdown of game story constructs, identifying the features of each game story construct for precise assessment; (2) The creativity indicators specifically target digital game stories, as they can detect the creativity that digital game stories need for stimulating players' excitement and enjoyment in the interplay of experiencing the story and playing the game, rather than simply for story readers; (3) Based on semantic implications, the creativity descriptors generally adopted by educators are categorized to correspond to creativity indicators termed differently by researcher; (4) Such a categorization integrates the perspectives and terminologies from both researchers and educators for creativity assessment.

5. Conclusion

The creativity assessment of digital game stories has not received deserved attention. Even though conducted, it is often treated as assessing general story writing without scrutinizing the nature and constructs of digital game stories as well as the adaptability between creativity indicators and digital game stories.

This assessment design devises a two-dimensional analytic approach to creativity assessment for digital game stories, identifying the significance of individual game story constructs and integrating the association of creativity indicators denoted by researchers and educators. This analytic rubric can not only assist evaluators like teachers to precisely assess digital game story creativity as well as effectively observe which aspects of game story writing are short of creativity, but also prompt game story designers like students and product developers to tailor creative and entertaining game stories. For digital game design courses, the proposed game story constructs, creativity indicators, and the analytic rubric can be used as effective teaching resources. More importantly, this assessment design accentuates the dynamic way of sparking creativity through digital

game story design. With this assessment rubric developed, future study will further examine its validity and reliability.

Acknowledgements

The research reported in this paper has been supported in part by the National Science Council in Taiwan under the research project number NSC 98-2511-S-024-004-MY3, NSC 99-2511-S-024-003-MY3, and NSC 101-2631-S-001-001.

References

[1] Basadur, M., & Hausdorf, P.A. (1996). Measuring divergent thinking attitudes related to creative problem solving and innovation management. Creative Research Journal, 9(1), 21-32.

[2] Besemer, S.P., & O'Quin, K. (1987). Creativity product analysis: Testing a model by develping a judging instrument. In S.G. Isaksen (Ed.), Frontiers of creativity research: Beyond the basics (pp.367-389). Buffalo, NY.: Bearly.

[3] Domino, G. (1994). Assessment of creativity using the ACL: A comparison of Four scales. Creativity Research Journal, 7(1), 21-23.

[4] Torrance, E. P. (1966). The Torrance tests of creative thinking-norms-technical manual research edition-Verbal Tests, Forms A and B-Figural Tests, Forms A and B. Princeton, NJ: Personnel Press.

[5] Williams, F. (1980). Creativity assessment packet: Manual. East Aurora: N.Y.: DOK Publishers.

[6] Schell, J. (2008). The art of game design. Burlington, MA: Elsevier Inc.

[7] Hocevar, D., & Bachelor, P. (1989). A taxonomy and critique of measurement used in the study of creativity. In J.A. Glover, R.R. Ronning, & C.R. Reynolds Eds.),Handbook of creativity (pp.53-75). New York: Plenum Press.

[8] Colangelo, N., Kerr, B., Hallowell, N., & Gaeth, J. (1992). The Iowa inventiveness inventory: Toward a major of mechanical inventiveness. Creativity Research Journal, 5, 157-164.

[9] Lubart, T.I. (1994). Thinking and problem solving. In R.J. Sternberg (Ed.), Creativity (pp.289-332). New York: Academic Press.

[10] Simonton, D.K. (1984). Genius, creativity, and leadership: Historiometric enquiries. Cambridge, MA: Harvard University Press.

[11] Kaufman, J.C., Cole, J. & Baer, J. (2009). The construct of creativity: Structural model for self-reported creativity ratings. Journal of Creative Behavior, 43(2), 119-132.

[12] Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. Journal of Personality and Social Psychology, 43, 997-1013.

[13] Grove, G.A. (1999). PYTHAGORAS B / C: An experimental measure of verbal and nonverbal creativity. Retrieved from http://www.mysteriumsociety.org/psimetric%20solutions/pyth_bc.html

[14] Arter, J., & McTighe, J. (2001). Scoring rubrics in the classroom: Using performance criteria for assessing and improving student performance. Thousand Oaks, CA: Corwin Press Inc.

[15] Engel, T., & Streich, R. (2011). Yes, There Is Room for Soup in the Curriculum: Achieving Accountability in a Collaboratively Planned Writing Program. The Reading Teacher, 58 (7), 660-679. doi: 10.1598/RT.59.7.5

[16] Spence, L. A. (2010). Discerning writing assessment: Insights into an analytical rubric. Language Arts, 87 (5), 337-347.

[17] Rhodes, M. (1961). An analysis of creativity. Phi Delta Kappan, 42, 305-311.