UNDERSTANDING GAME IDEATION THROUGH THE LENS OF CREATIVITY MODEL

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Abstract: Creativity in game design is not as widely studied as it is in general design discipline. While it may be argued that game design is simply a special case of design, in reality, it is peculiar in many ways and hence needs special attention. We aim to understand the game ideation process through the lens of creativity model. We first develop a theoretical creativity model based on the concepts in the creativity literature. We then study the ideation process of game design students and understand how it fits with the proposed theoretical model. We find that the game ideation discovered through field study broadly follows the theoretical model. Our larger research goal to develop a refined ideation model and build an ideation tool for game designers. This paper discusses the first step towards it.

Keywords: Game Ideation, Game Design, Creativity Models

1. Introduction

Game design is a highly creative endeavour and designers are under immense pressure to come up with new games every time. Some designers resort to extending existing game ideas and producing sequels which do not provide its consumers with newer gaming experiences. Game designers could do well with specific guidance on idea generation. However, the first step is to understand how game designers generate ideas today.

However, Game Idea generation or creativity in game design is not a highly researched subject. Hagen (2009) brings out the lack of innovation in the game industry, which is often accused of making sequels and extensions instead of creating new game concepts and genres. He also indicates that very few studies about game design and the origin of game design ideas have been conducted.

In this paper, we endeavour to develop understanding of the game ideation process and view it in relation to theoretical creativity model. We draw from existing literature on creativity in design to first build a theoretical model of creativity for game ideation. The emergent temporal model with elements that contribute to creative design is then used as reference to compare findings from the field study. As part of the field study, we conduct semi structured interview with 23 game design students. While we acknowledge that collecting data from just one segment would not suffice for generalizability, it is nevertheless a useful beginning. We intend to pursue further research by conducting protocol analysis studies with experienced designers, however that is not in the scope of this paper.

2. Related Work

Games belong to that category of artefact that is designed for engagement which includes movies, games, books, music etc. However, unlike other media, games involve high level of interactivity. The players control their experience by changing the pace and/or the sequence of events happening (J Schell, 2010). This makes the process of designing games unique, which is a motivation for our study. We searched for available work in the area of game idea generation from leading conference publications and journals in the field of game design and design in general. We find limited work in this space but it provides a useful starting point. Tschang and Szczypula (2006) have done relevant work in building game ideation model. They begin by distinguishing game ideation from any other product (design) ideation. They argue that games are an archetype of emergent complex products due to their interactive nature. Also, game design being a second order design problem, designers are unsure of how play will emerge from the design. The authors distinguish between creative and rational approaches to design and suggest that game ideation follows a predominantly creative approach due to lack of constraints as well as lack of rules. Not surprisingly, the authors suggest that in order to develop a theory of how game ideas come about, the literature on creativity would be the guiding light.

The authors further explain three facets of creativity-based game design: idea creation, constructivism, and evolution. Idea creation is generating ideas through inspiration, insight, and influence or envisioning. They describe constructivism as a particular creative process by which designers combine (and in the process, adapt) elements from different sources (including societal influences) into the artefact. In Evolutionary approach, the artefact evolves through transfer and mutation of knowledge across individuals' minds. They propose a model for idea generation which is a combination of activities at the individual level. These activities are influenced by designers own background as well as social interactions. Though this model is a very useful beginning, to understand relevant concepts, it lacks any specific arrangement or flow.

Kultima (2010) and Hagen (2009) have worked on understanding game ideation process. However, they do not propose a specific model. Kultima (2010) suggests that, initial game ideas may be produced in solitude but it is important that the voices of others on the team be also heard, engendering a process of many ideas contributing to one idea. She conducted a study which shows that game professionals purposefully seek inspiration outside games, and the creative process of coming up with new game ideas is purposefully affected. Hagen's study (2009) on game ideation indicates that a new game concept generally consists of two parts - the recycled part consists of ideas that have been used before in earlier games, in a movie, a book etc., and the innovative part which consists of original ideas. He suggests that game ideas can be drawn from various sources, such as those from within game domain, from narratives and visual art and from human activities.

The brief discussion on existing literature provides us the elements that contribute to game ideation, such as the sources of ideas, the steps of ideation, the role of individual background as well as the interactions, and the methods for the composition of ideas.

3. Theoretical model

Our approach to the development of a theoretical model of game ideation is based on drawing and arranging elements from available sources on game ideation as well as creativity in design in general. From the related work in game ideation space, we extracted elements of relevance for the model. In this section, we will understand the elements of a creative process. We will then combine these to propose a theoretical model for game ideation.

We begin with a formal understanding of creativity. While there are several definitions of creativity, we refer to Mumford & Gustafson (1988) who define creativity as a complex phenomenon that involves the processing of multiple influences at different stages, moving from the initial generation of an idea to the delivery of an innovative product. This definition indicates a temporal dimension to the creative process. Though there is a debate on whether creativity is a multi-step process or a moment of enlightenment, we find the view of Gigerenzer (2003) more balanced. He suggests that ideation is more structured than thunderbolt guesses but less definite structure than a monolithic logic of discovery.

One of the influential and early models of creativity, proposed by Graham Wallas (1926), divides creativity into the four distinct phases. These are Preparation, Incubation, Illumination, and Verification. Wallas model is widely referred in creativity literature and many other models are developed with this model as the foundation. Therefore we use this model as the underlying framework for our proposed model.

We further look at other important elements of creativity that we may integrate with the temporal model of Wallas. The first set of elements are about the individual background and the social context. Mace et al, (1997), argue that creativity should be viewed as the interaction of multiple variables, including the creative individual's cognitive, emotional, motivational, and behavioural processes, and how these intrapersonal variables complement the social and cultural context in which the creative person works. Herring et al (2009), suggests that the creative process can be inhibited by individuals inability to entertain ideas that violate previously held assumptions, rules, and conventions.

We also look at the role of constraints. Johnson-Laird (1988) propose two models /approaches to creativity based on how ideas are filtered - the Neo-Darwinian model and the Neo-Lamarckian model. Neo-Darwinian creativity is characterised by the unrestricted combination of ideas to produce potential new ideas, which are then subject to a screening process based on predefined constraints in order to filter out the ideas which are non-viable. Conversely, Neo-Lamarckian creativity involves imposing the constraints from the beginning in order to generate only viable ideas. Lawson (2005), also suggests that a design constraint is a requirement of the design process that might restrict the space of the solutions for a certain design problem. The function of the constraint can be radical (strong effect for the design), practical (realities of the producing), formal (visual organization of the object) and symbolic (expressive qualities of design).

Kultima, et al (2008), emphasized the role of domain specificity in creativity. She suggests that creative performance in any domain requires domain-relevant skills, creativity-relevant skills, and task motivation. She argues that game design is an organic process, where designer moves according to the situation using related insights, drawing from their specific experiences and thus suggesting that creative processes are domain specific.

We arrange the various elements and concepts found in the creativity literature as well as game ideation literature along the axis proposed by Wallas (1926) and create an integrated model for game ideation. This is shown in figure 1 and explained further. The arrangement is based on mapping the concept with the most likely stage where it would surface.

In this model, the preparation phase is where domain plays an important role in guiding decisions about which kind of game, for which purpose. The availability of resources (time to design/develop, budget) etc. can constraint the complexity of ideas by elimination at the beginning as suggested by the Neo-Lamarckian approach. However, this may not be always the case. Designers may begin freeform and apply constraints at a later point as in Neo-Darwinian approach.
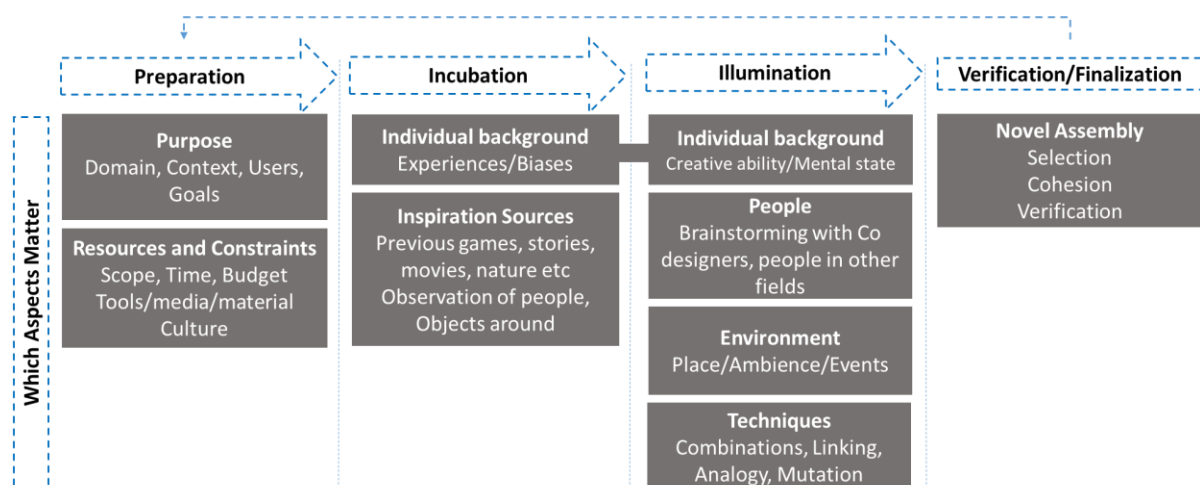

Figure 1. Proposed Game Ideation Model

The Incubation phase is where designers look for inspiration. According to Hagen's (2009) study, the most important source is existing games. This method may give quicker results but it is unlikely to generate a completely novel game. Individual experiences (problems faced, observed, preferences, comfort, and convenience) matter significantly in the incubation phase. The incubation phase narrows the ideation space to a limited number of threads or topics.

The illumination phase is the critical step where a new idea emerges. Although the idea may appear suddenly, it needs prior effort through idea generation techniques such as brainstorming, storyboarding, prototyping, sketching etc. (Herring et al 2009). A new idea may not be entirely new but a combination, mutation or analogy of existing ideas (Rosenman and Gero, 1994). It may also arise from linking multiple existing ideas (Goldschmidt 2014). Apart from the effort aspect, there could be events happening around or serendipity that may lead to illumination. According to Kultima (2008), playful atmosphere or playing a game can trigger new ideas as well.

In the "verification" stage, once an idea seed is germinated, it needs further cohesion and completion to make it a verifiable idea. This stage is about arranging the elements around the core idea to form a novel assembly.

4. Exploratory Study

For validation of the theoretical model, we attempt to understand creativity in game ideation through empirical methods. We conducted two studies in a span of a couple of months. The first study was conducted as a part of a game design competition in 2016 with 15 young designers. The competition required that the participants conceptualize a game and develop a prototype in four weeks' time. We conducted an interview at the time of presentation. We asked the participants to sketch the ideation process.

The second study was conducted during a game design course also in 2016 with 8 participants. Participants were instructed to make a paper prototype of a non-digital game i.e. board game, card game or any game with props. The data was collected through semi-structured interviews.

Participants across the two groups had a median age of 25; predominantly male, were either undergoing masters in design or engineering and none had prior game design experience (other than part of the coursework). We had not recruited the sample with specific criteria as we capitalised on the opportunity presented by the competition and the scheduled course.

The interview questions specifically included tracing the steps of ideation. Along with steps, we asked questions about the triggers (for ideas), identification of elements from the content, use of ideation techniques, support-taken from other people and the role of environment. After the interview data was collected from individuals, we collated data from all the interviews and then categorised and arranged the same.

5. Findings

Figure 2 shows the arrangement of concepts as they appeared from multiple interviews. We have shown the evolution of three games, namely 2D Geo, Savior and Leap as representative examples.

It is important to note that each participant did not follow the exact same flow but about 80% of these steps were covered roughly in the same sequence. Once the game purpose such as education or environment protection or healthcare is given, the participant started with research of the content. This research also includes finding existing games in the space. Participants then identified a specific purpose/objective for the game. The selection of topic is mostly based on personal preferences – experiences, problems faced, biases or convenience. For example, if middle school education is given as broad area, participants may choose History chapter because it was boring to them or geometry chapter because it will be easy to visualise or Physics chapter because it is, was difficult to understand.

Post this, the participants started thinking of game concepts that can fit with the relevant topic. A step that every participant took here was revisiting existing games and identifying gameplay/patterns. As the

next step, they identified elements from the content for translation to the gameplay. This is where participants struggled most and relied on ideation techniques. This is also the point where some topics are dropped and new ones considered.

Once the participant was able to map elements of content to gameplay, the seed for a game idea is germinated. For example, one participant was working on a game for teaching basic geometry shapes to middle school students. The translation of content was about creating complete shapes (broken shapes were printed on cards) and using the mechanics of collect and match.

After this step, the story and additional elements of luck, blocking, balancing, scoring are introduced. This completes the development of a concept. Further, the generated concept is bounced with colleagues to enhance and finalize.

The descriptive analysis of the data suggests that bouncing ideas (for individual creativity) and brainstorming (for group creativity) were the major techniques employed for generation of ideas. We found only a marginal influence of the place (location where the idea originated) and objects (things that were around when the idea originated) on game idea generation but peaceful ambience played a more significant role.
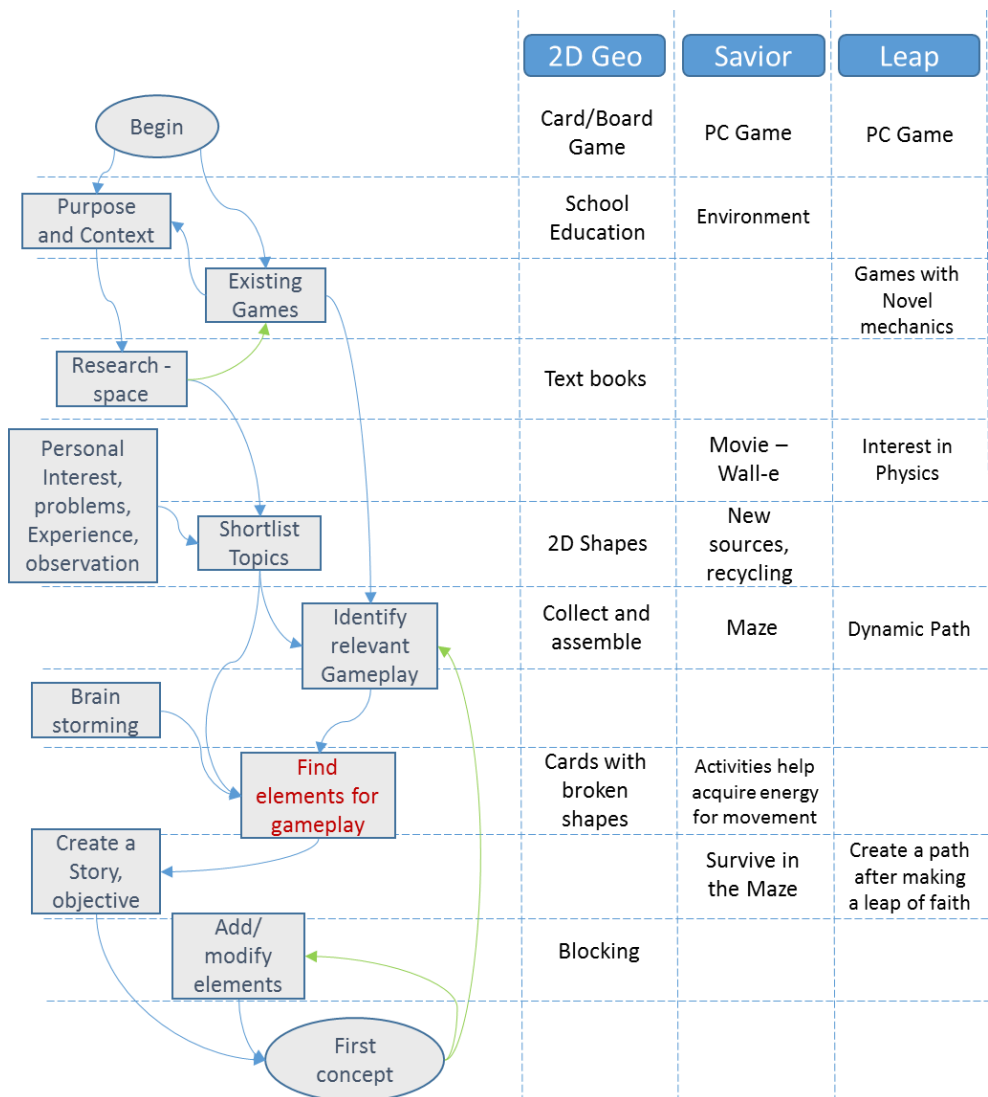

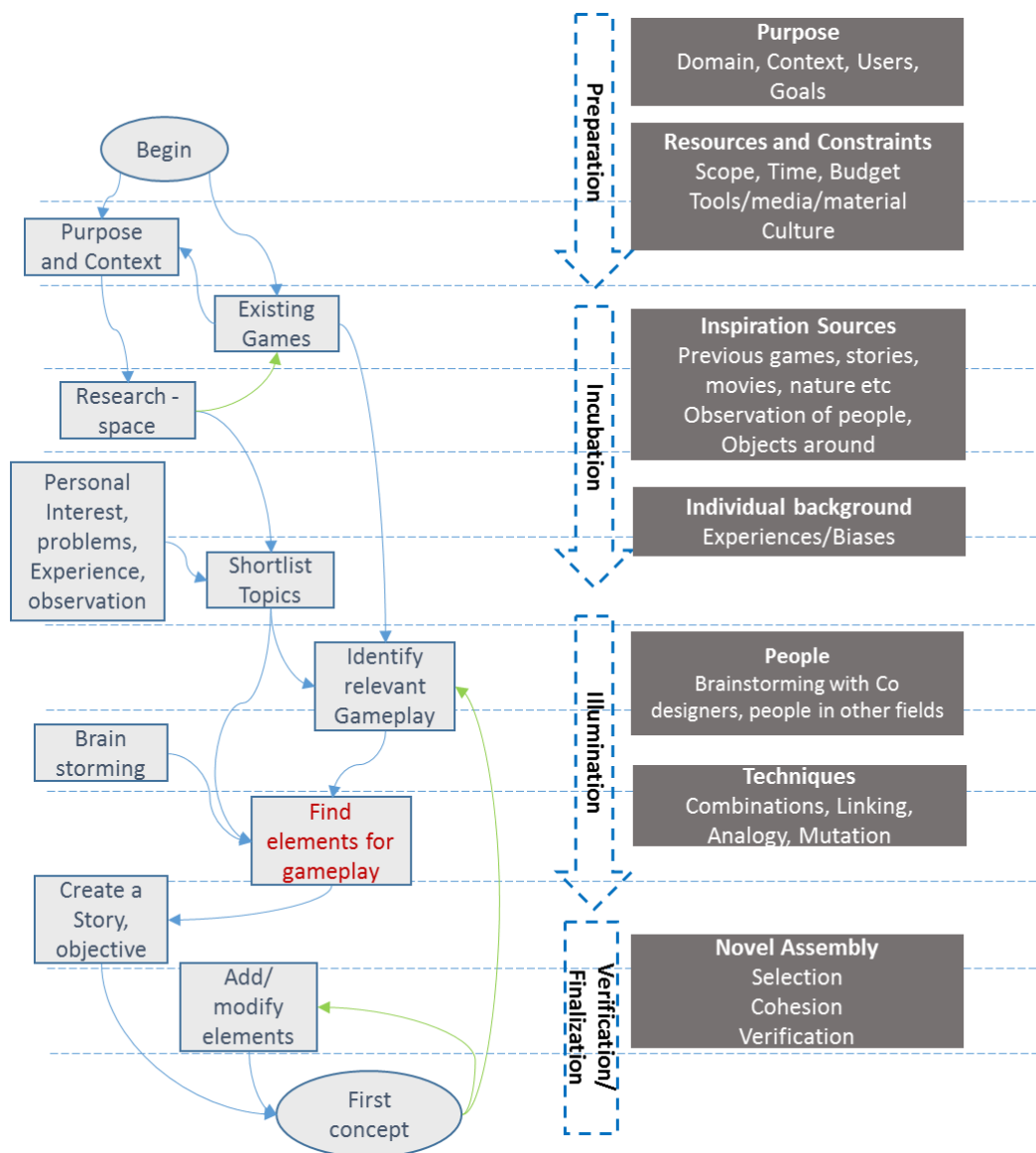**Figure 2.** Game Ideation Observed from Field Studies

Figure 3. Game Ideation Process Overlap

6. Discussion

In figure 3, we compare the theoretical model with the discovered ideation process side by side. We find a good overlap between the two. The commonality between the two is highlighted further.

In the preparation phase, the domain is understood and type of game (scope/constraints get decided). In the Incubation phase, the participants look for inspiration from existing games. The participant's background influences the focus area. In the illumination phase, the participants conduct activities such as sketching/brainstorming hoping for a new idea to emerge from the content to form the core gameplay. Finally, in the "verification" stage, the concept is completed with remaining elements such as story, rules etc. It is during this phase, designers "put" themselves into the conceptualized game (mentally) and evaluate the fun element. While it is common practice among other artefact designers do the same for their products, we find it unique for game designers to visualize the extent of play in their design. This evaluation is further used to add/modify game elements.

Additionally, we observe that during game ideation there are two conceptual spaces: the purpose and game spaces. During the game ideation process, there is a flow of information between the two spaces, which leads to one refining the other. For e.g., the purpose of the game helps in identifying relevant

gameplay and the gameplay helps in refining the purpose. It appears that both these spaces are co-evolving. This is analogous to Maher et al's model (1996).

The proposed theoretical model is thus validated through field data. However, we have several stages to go through, before claiming a refined and rigorous model. In the next stage of our research, we intend to conduct protocol analysis studies with experienced designers. This would provide us deeper and accurate insights than post hoc surveys.

7. Conclusion

The objective of our present work was to acquire a preliminary understanding of the game idea generation space and propose a first cut game ideation model. In this paper, we have built upon the work of various authors to understand the nature of creativity in game design. We conducted a literature survey on existing work focused on creativity and game ideation. Next, from the theoretical concepts in literature, we constructed a theoretical model of game ideation process. Thirdly, we conducted exploratory field studies to understand the nature of creativity in game ideation. The proposed theoretical model corresponds to the typical flow of game ideation that emerged from the exploratory studies.

The understanding of creativity through this and further research would help us build creativity support tools focussed on game design. On a longer timeline, we believe that our research and similar such studies could help in building systems that generate creative game ideas and help automate game design processes.

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