Design Thinking in Gamestar Mechanic: The role of gamer experience on the appropriation of the Discourse practices of Game Designers

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Abstract: This paper explores the pedagogical potential of *Gamestar Mechanic*, a computer game where players learn the principles of game design by making, sharing and reviewing games in the context of an online community of designers. The game has been designed to foster the appropriation of complex language and literacy skills by middle school children. By relying on think aloud interviews and a discourse analytic framework, this paper explores the language practices germane to the game designer Discourse enacted by players as they tackle a game design challenge.

Context for the Study

Thinking as a designer has been recognized as an important asset to learners in a world defined by the globalization of economy and intense pressure on them to produce new knowledge, innovate, and solve complex problems (Kolodner, Crismond, Gray, Holbrook, & Puntambekar, 1998; New London Group, 1996). Adopting a designer perspective entails an epistemological shift by the learner from the teacher-driven transmission view commonly promoted by schools, to a conception of knowledge as a dynamic construct that emerges from a dialog between the designer, the designed and a larger community of design practitioners (Schön, 1995).

Game design, which sits at the intersection of computer science, graphic arts, interactive storytelling, has been hypothesized to be an intellectually valuable design practice as it could provide avenues for youth to develop computational literacies, software design skills, models of systemic thinking, and specialist language and literacy skills (Games, Learning, & Society, 2005). Game design is an eminently social activity, where the task is distributed among teams of designers, programmers and artists. As a consequence, effective game designers must recruit a variety of oral and written language practices, using a variety of media in order to communicate game ideas across teams, defend specific design decisions, or present insights learned from designs in the form of *post-mortems* (Grossman, 2003) among other things.

The popularity of computer and video games, particularly with low-income boys disaffiliating from school, make it an intriguing domain for exploring language and literacy development. Recent research on literacy learning documents the prominence of the *fourth grade slump* (Gee, 2004; Hart & Risley, 2003), a phenomenon whereby seemingly well performing students (particularly disadvantaged students) in early literacy, fail to do so in later grades where specialized language is introduced. This problem becomes compounds throughout late elementary and middle school, developing into what some have called "the eigth grade" cliff, a point at which students failing complex literacy tasks such as inference, comprehension, writing, and domain-specific reading disaffiliate and drop out of school (Chall, Jacobs, & Baldwin, 1990; Chall & Jacobs, 2003; de León & Carnegie Corporation of New York, 2002). These phenomena have been cited as key reasons for students dropping out of school, which, with almost 40% of male students dropping out before graduation, is a pressing national concern (Ewell & Wellman, 2007).

The study in this paper happens in the context of *Gamestar Mechanic,* an online role-playing game that is about designing video games to help students practice and learn complex language and literacy skills. Gamestar Mechanic is designed to initiate players into the Discourse of game design, through a series of well ordered game scenarios and encompassing curricular activities that are designed to emulate the key learning practices operating in game design communities. The game is currently under development in joint collaboration between GameLab, a New York based Videogame Company and the Games, Learning and Society group at University of Wisconsin-Madison. It is currently funded under the Macarthur Foundation's Digital Media Learning Initiative, a $50 million effort aimed at understanding the effects of digital media in young people's lives.

About Gamestar Mechanic

In *Gamestar Mechanic*, players take on the role of "game mechanics", characters that are brought to a fantasy world where the economy, culture and lifestyle are fueled by well-functioning games. In the plot of the game however, a catastrophe has taken place resulting in that the overall system upon which the world functions has been broken, and the elements which once comprised well made games have fallen to disrepair. Mechanics must interact with world elements in the form of game *creatures* (e.g. heroes and enemies) through which they can make and repair games and gradually restore harmony to the world (Salen, 2007). Players advance in the game by participating in a series of *game design challenges*, which introduce them to the parameters and rules

that define the behavior of each creature, and its relationship to the game system as a whole. Players can also gain the ability to access and manipulate these parameters and behaviors through the use of a web-based *game editor*. By using this tool, players can modify character properties such as speed, strength, and response to other creatures, as well as systemic characteristics of the games they will be part of, such as the design of game levels and game rules, allowing players to produce complex interactions in their games (see Figure 1).

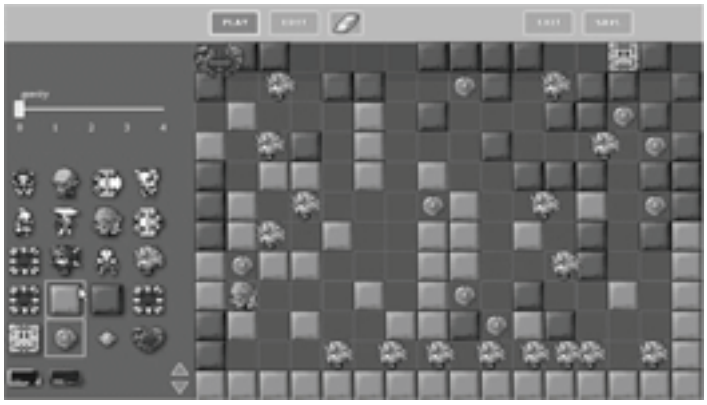

Figure 1. A game design by Marc, one of the workshop participants in an early version of the Gamestar Mechanic Game Editor.

In some ways, *Gamestar Mechanic* may seem similar to constructionist approaches aimed at facilitating computing as a form of literacy (DiSessa, 2000; Resnick, 1994). However, a fundamental difference between these approaches and the *Gamestar Mechanic* approach is that in constructionist tools such as Logo or Boxer, the emphasis has commonly been placed on teaching students the fundamentals of programming, in hopes that once familiar with the tools, they will appropriate them in their own designs. Conversely, *Gamestar Mechanic* places an emphasis on teaching what James Gee calls the *Discourse* of game design, a term which refers to ways of doing, talking, thinking and using tools that game designers enact in professional practice (Gee, 2005). In other words, while constructionist approaches to computational literacy have emphasized *learning to make* meaningful creations with computers, the approach proposed in *Gamestar Mechanic* focuses on learning *how to make* those meaningful creations through games.

In order to give the game this emphasis, design challenges within it are framed within the context of a *metagame* consisting among other things of an overarching narrative and rule system that help define player characters' identities, goals, and paths of advancement and status within an *online community* of game mechanics. The challenges are constructed in ways that require players not only to design games, but also to engage players in written discourse with other members of the community.

This paper explores the way in which previous gaming experience by middle school players influences their adoption of the language and literacy practices of game designers in the context of a *Gamestar Mechanic* design challenge. By relying on a discourse-analytic methodology, it aims to illustrate the ways in which a gamer identity mediates the adoption of a game design Discourse through play.

Theoretical Framework and Research Questions

This paper examines learning from a social-constructivist framework of learning. The central interest of this study is to understand the appropriation and enactment of a Discourse by players. That is, how players adopt and enact ways of design thinking and doing, and to explore the utility that these habits may have in other spheres of life. Within this framework, language is central to the learning of individuals and communities, since it mediates the negotiation of meaning between individuals, tools, and context (Scardamalia & Bereiter, 1996, Vygotsky, 1930). Lemke (1990) for example, uses the term "talking science" to address the ways in which scientists use language to communicate findings and disseminate knowledge across their communities. At the same time, a socio-constructivist view of learning within games characterizes it as conceptual change that is achieved through the gradual appropriation of a discursive identity by the learner (Shaffer, 2007). Gee calls identities such as these big 'D' Discourses (Gee, 1999, 2005), an umbrella term that encompasses multiple sociocultural theories of knowledge (Hutchins, 1995; Lave & Wenger, 1991), and refers to "ways of knowing, talking, doing and being in the world" practiced by people affiliated to a certain identity. The term stands in contrast with little 'd' discourse, which refers to instances of language-in-use through which people situate meaning and construct reality for themselves and others at any given time.

This project takes advantage of a learning-through-design instructional framework (Kolodner, et al. 1998; Perkins, 1995) as a means to foster the emergence of a game design Discourse in children. In this design approach, learning is achieved through an iterative process enacted through the production of public artifacts in

problem-based contexts. Such approaches also emphasize experience as central to learning, and rely on presenting students with learning scenarios where ill structured problem solving tasks are framed within the context of close to real-world situations. An example of these frameworks is *Learning by Design* (Kolodner et al, 1998), which blends insights from case-based reasoning pedagogy (Riesbeck & Schank, 1989) with problem-based learning (Barrows, 1998). This framework presents learners with a sequence of modules where they must tackle challenges centered on the design of real world artifacts, which in Gamestar Mechanic are embodied in a series of *game design challenges.* In these challenges players are required to engage with specific design problems that require the enactment of a designer Discourse for their solution. These challenges are constructed to introduce learners to key ideas and language in the Game Designer Discourse, and require players to put them into practice as they tackle their game designs. For example, the introductory statement for a challenge could be:

> "A core mechanic represents the essential moment-to-moment activity of the player, it is what the player will be doing over and over as he plays the game. For this challenge, make a game where the core mechanic is to *collect things.* When you're done with your design, write the instructions for your game so that others can play it."

In this statement, introduces the player to the game design concept of *core mechanic,* a specialist term that refers not only to a fundamental component in games (the central activity of the player), but that also emphasizes the need to design mindful of the systemic relationship between game elements (e.g. a collect mechanic would be useless in a game with nothing to collect).

Alongside design-based frameworks the work on constructionism has served an important role in informing this study (e.g. Harel & Papert, 1992). Constructionist approaches emphasize not only the design process as a way to enact the public construction of knowledge (Papert, 1991 p.1), but also the role of *epistemological pluralism* (p.10), which refers to the need to acknowledge the existence and value of multiple ways of knowing beyond those traditionally accepted by schooling. Given that one of the most fundamental ways of learning within *Gamestar Mechanic* comes through the completion of *design challenges,* where meaning making happens with a mixture of both the grammar of traditional texts, and the design grammar of games, these frameworks became useful in the attempt to understand the players' design strategies and process towards their design goals.

Close to these approaches, the third theoretical framework this study relies on is DiSessa's work on the Boxer programming language (DiSessa, 2001). In Boxer, DiSessa and colleagues designed a programming language that removes the abstraction and complexity inherent to most commercial languages, with the purpose of letting novice computer users engage in an experiential approach to learning through simulations, by constructing models in which patterns of design and knowledge can emerge. In his view, one of the most important benefits that programming can bring to learners is the ability to create simulations that will help them learn complex concepts in more experiential ways (P.35). While *Gamestar Mechanic* fully aligns with these views, it differs from this and other constructionist approaches to computational literacy in that it doesn't have their underlying assumption that the activity of construction itself will motivate learners to use tools such as Logo or Boxer. Conversely in *Gamestar Mechanic*, the assumption is that videogames have become a widely disseminated medium that many children are familiar with, and enthusiastic about. Gamestar Mechanic attempts to harness this enthusiasm by fostering a community where game design principles and patterns are learned through active participation in play, and construction plays a more supportive role.

The notion of thinking through simulations put forth by DiSessa has been echoed by researchers in the field of games and learning (Gee, 2003, Squire, 2006). This field recruits a diversity of learning science frameworks to analyze the learning that takes place in the context of game play. These include situated learning (Lave and Wenger, 1999), Connectionist cognitive models (Gee, 2003), socioconstructivist perspectives on technology-supported learning (Bonk & Cunningham, 1998; Vygotsky, 1930), and models of knowledge based on the professions (Schon, 1995; Shaffer, 2006). Research into games and learning suggests that by playing videogames, players learn to see them as *designed objects* (Gee, 2003 P.42) which represent complexly interrelated and context-dependent meanings that designers build using symbols that are given structure through a *design grammar* (p. 30). Players also learn to see games as forms of *text representation* where aspects of printed texts such as genre are also present (Gee, 2005 P.108). If in line with this view games should be considered a form of new literacy, game play could be said to be analogous to reading, and design to writing. This notion becomes even more compelling if one considers that several scholars have put forth the notion of written text as a designed object in recent years (Kress, 2003). Given that reading and writing are the most used literacy practices in schools today, one could then imagine that some aspects of the discourse of game designers could serve as a basis to help students participate more effectively in their school lives.

In line with this theoretical framework, the four guiding research questions posited for this study were the following:

1. How and to what degree does language reveal the enactment of a game design Discourse by students in the context of *Gamestar Mechanic*?
2. What aspects of the game designer Discourse play out in the solution of a *Gamestar Mechanic* Game Design Challenge?
3. In what way does *Gamestar Mechanic* facilitate learning through games and simulations?
4. What similarities and differences between the Discourse of game design and the discourse of School emerge in the context of *Gamestar Mechanic*?

Research Site and Participants

One of the central aims of pedagogies such as the one furthered by *Gamestar Mechanic* is to bridge the gap that exists between the learning and literacy practices of formal education settings and those of informal learning communities. Given that videogames nowadays find their principal venues in the second category, the current study focused on the use *Gamestar Mechanic* and its associated curriculum in out-of-school settings.

Participants were recruited from a variety of after school programs in a several cities in the greater Madison-Milwaukee Wisconsin area, as well as from the general community, through flyers which invited them to participate in a short workshop where they would learn to make games by playing games. The project began in January 2007, and to this date three instances of the workshop have taken place, two of the workshops took place in a computer lab at the University of Wisconsin-Madison, and one at a High School in a suburb of Milwaukee. Given that the main populations of interest to the project are middle and high school students, particularly those from low-income households, thirty participants between the ages of 12 and 16 years both backgrounds in order to help us identify differences in the interactions with *Gamestar Mechanic* between low and high-income groups.

Methods:

Data Collection

The background information for all participants was obtained by a series of ethnographic interviews (Spradley, 1979) done individually with before the start of each workshop. Since a core interest of this study was to assess the relationship of previous gaming experience to the adoption of the language and literacy practices that Gamestar Mechanic aims to foster, through the interview background data was collected on the participants' number of years as a player, number of games played, favorite games, and ease of access to videogames at home or in other contexts. Also, in-workshop activities such as game design discussions, play sessions and collaborative design challenges were documented via video recordings and field notes.

In addition, in order to assess the language and literacy practices of players, samples of oral and written language skills were collected before and throughout the workshop in the form of game labels, blog entries, level messages and digital voice recordings of design discussions.

Finally, a hybrid data collection approach mixing video capture of the participant's computer screen during the design process, mixed with a think aloud interview of participants during the process was used in this study. This approach has recently gained popularity to assess participant problem solving and information search strategies in human-computer interaction (Benbunan-Fich, 2001). Given that the intention of this study was to understand the use of language used by the participants to explain their design process during a Gamestar Mechanic challenge, the focus of the analysis was on meaning making practices rather than on the cognitive aspects of the problem solving process itself, the think aloud takes the form of an interview as opposed to a protocol in the traditional sense. In order to add reliability to the analysis, aside from notes taken by the researcher, both the participant and the computer screen wee recorded during the think aloud, using a digital camera and a CamStudio (http://camstudio.org), screen recording tool and the data were analyzed and corroborated with four other research team members.

Data Analysis

This presentation will focus on the language and literacy practices enacted by players as they tackled a *Gamestar Mechanic* design challenge. The data collected from the interviews, field notes, video and audio recordings was consolidated using a case study methodology (Stake, 1995) with the purpose of providing a "thick description" that would serve as a context to frame the think aloud interviews used during the challenges.

The think aloud data were analyzed using a Discourse analysis methodology (Gee, 1996, 2005), which focuses on the situated meaning making practices that people enact through language-in-use. The interpretation of this analysis relies on *seven building tasks of language* (Gee, 2005 P.10) that people use to construct reality at any given time. These are (1) *significance*, using language to make certain things more relevant than others, (2) *activities*, using language to get recognized as engaging in a certain activity, 3) *identities*, using language to get categorized as enacting a certain role or identity, 4) *relationships*, using language to signal a sort of relationship between two people, 5) *politics*, using language to convey a perspective on the distribution of social goods, 6) *connections*, using language to highlight the relationships between two incidents or concepts, and 7) *sign*

systems, privileging certain ways of communicating through symbols over others. Depending on their relevance to a particular sample of language, some or all of these building tasks provide a lens through which to understand language practices used in a context of interest, -in this case game design- as a means to generate claims on theory.

Preliminary Findings

For the sake of space, this section will concentrate on presenting a sample of the project's preliminary findings by based on a few excerpts from the think aloud interview conducted with a participant tackling a design challenge in a *Gamestar Mechanic* workshop. The challenge consisted in building a game using only four creatures from a set of 16 possible choices within a time limit of 15 minutes. The participant also had the opportunity to swap one of his initial creature choices for a new one at any point in the design, if he wished to do so. Before each excerpt, a brief description of the participant's background is presented for contextualization. The excerpts present two segments of the protocols where the researcher observed significant design changes being enacted. In line with the methodology suggested by Gee (2003), the transcripts of these interactions are presented coded into *lines,* which represent spurts of speech separated by silences, and *stanzas*, which group lines into structures with a specific theme or idea in order to provide context to the analysis. Emphasis, silence, tone and other linguistic elements are transcribed using the standard notation proposed by Gail Jefferson (Jefferson, 1984).

Discourse Analysis I: Orality, Argumentation and Problem-Solving in the "design game".

The following transcript presents the think aloud protocol for Marc, a Caucasian thirteen year-old middle school male from a low-income household in the Madison-Wisconsin *Gamestar Mechanic* workshops. In the interview at the beginning of the workshop, Marc self-identified as a gamer and stated that he owns a PlayStation 2 console and a variety of game titles. Even though he comes from a low-income working class family, his family seems to value his interest in gaming, as he has access to cable at home and is an avid viewer of G4, a channel devoted to videogames. In his preliminary interview, Marc also expressed a deep disaffiliation with school and samples of his reading and writing demonstrated low school-based literacy skills. For example, a description of a game he made, taken from the game's label, reads:

> "The presoners [sic]
> There was a war a big war[sic] It tuck [sic] out a lot of sogers [sic] but some servived [sic] but got capshered [sic] in the prison"

Following is the transcript of an interaction that took place at the beginning of Marc's design task just after he researcher had finished reading the instructions for the task:

> Stanza 1
> R1: You can choose four creatures from, from your palette.
> R2: And you need to make a game out of those four creatures
> R3: And if for whatever reason the four creatures that your chose do not make a game
> R4: Then you need to, you can swap [one, just one
> Stanza 2
> M1: Hold on] I think umm, a major (.) point=Is this a character? ((Hovers mouse over the block and coin character and sets it to rest on a life meter character))
> R5: [Uh]Um, y:::es, all of those[are characters.
> M2: How] dare you?! ((uses mock tone))
> Stanza 3
> M3: I'd have my main character, which would be one of the heroes (hovers the mouse from the shooting hero to the play area).
> R6: uh::huh..
> M4: A::nd I'd put him somewhere and then I'd have (1.0) blocks
> M5: Some evil people,
> R7: Okay.
> M6: And have something to tell where your health is.

Recall that the seven building tasks of language laid of by Gee provide analytical tools to understand the way people situate meanings and structure reality for themselves and others during communication. Since the goal of this paper is to study the way participants enact the game designer Discourse, it should just briefly be mentioned that in Stanza 1, the researcher lays out the rules of the design challenge, bringing emphasis to the role that creature selection plays on its completion (Line R4). This becomes particularly interesting in the context of the participant's response to these instructions. Notice that between line R4 in Stanza 1 and M1 in

Stanza 2 there is an overlap between the researcher's statement and Marc's response at the point where emphasis on the creatures is being placed. Marc's response in line M1, illustrates the way that he negotiates the Discourse of game designers using aspects of the gamer Discourse he has so much experience on.

He does so by engaging in the seven building tasks in the following order:

1) Marc uses significance, which refers to using language as a way to make certain ideas salient over others, with the purpose of establishing what Toulmin (2003) calls the *warrant of an argument;* that is, he is clarifying the rules of the game design "game" he will be playing.

2) While the researcher's statements about the rules of the design task in lines R3, R4, and R5 are meant to demarcate a level of seriousness in the challenge, Marc challenges this approach through a rhetorical move which combines his query about rules (line MI) with his response in a tone of mock surprise at the limitations imposed by the researcher (line M2). He uses this move to demarcate the playful nature of the activity, in other words this is a low stakes space, a game about making games.

3) By using this strategy, he is also enacting the third language task of signaling a specific identity for the speaker, a hybrid gamer-as- designer identity, for the warrant that he is establishing is not for an argument in the traditional sense of the word, but rather for what counts as a valid game design-as-argument in the context of a design game.

4) With mock tone when he says "How dare you?!" Marc is engaging in the fourth task of language, establishing a relationship to others. In this case he is attempting to establish the sense of camaraderie and low deference commonly practiced in the gamer Discourse, thus signaling a more peer-level relationship to the researcher than what he would have had with an adult in an academic context.

5) Another interesting aspect of this interaction is the emphasis Marc is placing on certain creatures of the set. Different creatures are designed to have a greater or lesser impact on the overall game system. For example, adding an enemy creature introduces a high level of complexity by being able to move, chase, or damage the player's character, while a score counter serves a mainly informative function, telling the player the total points accumulated during the game.

In this case, Marc enacts the fifth task of language by attempting to build a common perspective with the researcher, regarding the political value of the social goods of the task, which for the challenge are the game creatures to be used in his design. He does so by focusing the researcher's attention on those creatures with a lower degree of complexity (line M1) and in doing so suggests that they should not be considered in the same status as creatures for the purpose of the design challenge given their low game value.

6) For the language task of drawing connections or disconnections between meanings, he is attempting to disconnect the block and life meter from other creatures, in an attempt to "legally" bend the rules of the design challenge, a common gamer and game designer behavior which scholars call *transgressive behavior* (Salen & Zimmerman, 2003), a strategy commonly used to produce new play strategies in games.

7) For the final language-building task, which consists on privileging or disprivileging certain sign systems as a way to convey knowledge, Marc's emphasis on complex creatures grants them privilege as symbols that will contribute more substantially to the game-as argument than less complex ones.

Even when Marc's ability to use some design grammar elements of *Gamestar Mechanic* to sustain an argument illustrates an important language practice that can take place in the game, when one frames the previous analysis in the context of the interaction in Stanza 3 the argumentative exchange in lines M1, R5 and M2 takes on a whole new meaning, since it plays a key role in understanding Marc's design choices further in the challenge.

After establishing a common ground with the researcher that the coin and health meter characters each count as one of his four possible choices, Marc is now placed in a crucial decision-making position within the task. He makes this position overt by declaring his choices of creatures before placing them in the play area (Lines M3, M4, M5 and M6). In doing so, Marc is again enacting his gamer-as-designer identity (Task 3), for by declaring ahead of time the choices of creatures he will use for his design he makes overt a heuristic by which he will approach the problem-solving process for this challenge.

The details of this strategy become particularly evident from the order in which he declares the creatures he will use, and highlights his views of the relative importance of each creature to the design of his game (Task 1). The first creature chosen by Marc is the avatar, a creature that embodies the player in the virtual world of the game (Line M3). The choice of this character provides important insight into Marc's previous question regarding the coins and heart meter. Within the avatars one can choose are some that can shoot and others that can't. Those characters that can shoot are designed to move more slowly than those who can't. By choosing a shooting character, Marc is declaring what game designers call the "core mechanic" of the game (i.e. the fundamental way in which the player will interact with the game system, see Salen and Zimmerman, 2003) and given the highest value to shooting over other possible core mechanics for the game.

The intention of his question about the coins and heart meter becomes clearer in this context, since for a mechanic of direct enemy engagement such as shooting, the heart meter would provide a higher strategic value to the player than the coin, as is discussed later in this paper. Conversely, if a non-shooting character had been selected, the coins and a meter to indicate how many had been picked would be more logical choices.

Marc's second and third creature choices of blocks (M4) and "evil guys" (i.e. enemies, M5) provide more evidence of his general solution strategy. In choosing these creatures, he is adding three fundamental elements to his game, namely a) a space layout and structure in which the game will take place, b) a win condition (through the goal block), c) an oppositional force or challenge. In fact, this composition as a whole reflects several recent theories of the fundamental nature of game design put forth by videogame scholars. In particular, the notion by Jenkins and Squire (2002) that a defining characteristic of games is their nature as spaces contested between opposing forces, a state of affairs that Marc's selection of game components accomplishes.

His final selection, the health meter, reflects Marc's understanding of the systemic relationships between different elements of the game. In choosing of this creature, he is making overt a mindfulness of the player's role in the game, an element commonly overlooked by novice game designers that often results in either unplayable or bad games. In choosing the meter, Marc is acknowledging the importance of providing feedback to players that may help them devise winning strategies.

In order to verify whether this strategy a simple approximation to a solution or a well thought plan, a post-design interview regarding his design strategy was conducted, and revealed that his approach was even more structured than a heuristic, and could arguably be seen more like an algorithm guided by well thought out experience and deduction. Given Marc's extensive game play experience, he explained that his design had been influenced by a similar game structures found in other games he had previously played, particularly by the Hades level in God of War II (God of War II, 2008). Marc's final design for this game is one where the player starts at the bottom of the level and must jump from block to block trying to reach the goal block at the top. Even though God of War is a far more complex game in terms of its graphics and elaboration that at the surface level does not look at all like Marc's game, an experienced game designer would most likely note that the mechanic in the level called Hades is fundamentally the same as this game. These deep structures, which architects and software engineers call design patterns (Alexander, Ishikawa, Silverstein & Jacboson, 1977) represent design practices that embody time-proven solutions (heuristics and algorithms) to certain problems within a professional field, in this case within the Discourse of Game Design. If one were to accept the notion that the transfer of learning can be understood as the gradual appropriation of the Discourse of more expert members of a community (Shaffer, 2006, Gee, 2003), then in using this design strategy he is enacting such a Discourse.

Conclusion

Going back to the guiding questions of this study, the preliminary analysis of interview data through case studies and discourse analytic approaches to language-in-use, one can begin to elucidate the way in which learners can appropriate and enact the game designer Discourse in the context of Gamestar Mechanic. Regarding language practices, one can begin to see that the argument by psycholinguists such as Bruner (1986) and Gee (1996) regarding the falseness of the notion of literacy as superior in sophistication to orality seems to be supported by the data. It also becomes evident that language can play as sophisticated and powerful a role in videogame design as it does in academic tasks. Even though an assessment of his written skills would show Marc as a student whose language skills are very low, giving him access to the *design grammar* of *Gamestar Mechanic* games provided him with a medium through which he could harness extensive gaming experience to support his argumentation and meaning construction processes, an idea in line with several theories of literacy development and assessment (Valencia and Pearson, 1987).

As important perhaps, is the fact that through the game designer discourse the adult evaluator was placed in a more peer-level role with Marc. Framed within the playful nature of the game design activity, this stance allowed the emergence of a space of safety and exploration that stands in stark contrast with the current Discourse of high-stakes and standardized knowledge fostered by schools. By using the editor's symbol systems (the creatures) to construct evidence for an argument (or in the case of Marc a game design-as-argument) is also a powerful move used by professionals to highlight this evidence and give it credibility to their arguments within their communities of discourse (Goodwin, 1994). At the same time, the strategies that Marc had to use to tackle design challenges such as the one presented in this article, indicate a level of planning, logic and problem-solving sophistication equivalent to those of academic tasks. Future research should explore these tasks as a form of assessment in more detail before any conclusions can be reached.

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