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Adolescents Composing Fiction in Digital Game and Written Formats: tacit, explicit and metacognitive strategies

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ABSTRACT This article reports on a study of 23 tenth-grade students who created fiction in digital game and written formats. The researchers observed them at work, analysed their stories in both formats, and interviewed selected students to learn what affordances and constraints they demonstrate and/or articulate in such authoring. The students used *ScriptEase*, a software tool that supports the creation of digital stories, based on the game engine of *Neverwinter Nights* (Bioware). The authors consider the theoretical literature about narrative and games, focusing especially on indicators of verbal tense and mood. They discuss the overlaps and differences between digital and written stories, drawing in particular on the work of two students, and they conclude with implications for theoretical understandings of contemporary narratives in multiple formats and implications for literacy education.

Teachers who encourage students 'to read like writers' and 'to write like readers' have long noted the impact of students' writing on their reading and the impact of their reading on their writing. Adding a different medium increases the metacognitive potential of this exercise. As young people increasingly become able to produce fiction in game and other digital formats, it is likely that their consumption, production and understanding of fiction in such formats will develop in ways that we cannot now predict.

This article reports on a project in which 23 Grade 10 students were given the opportunity to create two related stories, one in digital game format and one in words. Six of those students commented in subsequent interviews on their processes of creation in both media. We report in detail on the work of two of these students.

The artefacts created using the two different formats and the students' comments about their creative processes raise many questions for contemporary literacy education and many challenges for literacy teachers. Although creating digital game fiction may appear to be a marginal activity to teachers who must prepare students for high-stakes examinations (as these students' teachers must also do), our findings suggest that we need to consider vital questions about the core of the literacy curriculum for kindergarten to Grade 12 students in the coming years.

Many contemporary high school students are experienced digital gamers, and all of them have had years of practice in both reading and writing stories created in words. However, few students have had the opportunity to develop their own story in the format of the digital game. When the students in our project were given the chance to work in this way in a highly supportive environment, they learned new digital skills, made sophisticated decisions about what kinds of narrative were more appropriate to each of the two formats they were using, and articulated productive metacognitive strategies.

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Working with *ScriptEase*

Carbonaro, Szafron and Schaeffer, working in conjunction with the gaming company Bioware, developed a software tool for digital story composing that they named *ScriptEase* (http://www.cs.ualberta.ca/~script/), based on the game engine of Bioware's *Neverwinter Nights* (2002-2004). They created an intensive tutorial and supplied a strong support system for a class of tenth-graders who, in the spring of 2005, went on to develop their own game narrative using this tool. In 2006, this team was augmented by McClay and Mackey, who were interested in exploring student attitudes and achievements in two contrasting creative formats. This article is written by McClay and Mackey, and reports on a qualitative study of students composing narrative in digital game (using *ScriptEase*) and written (word-processed) format, conducted in the spring of 2006. In the spirit of the collaboration that marks this particular project, all project team members are included as authors of this article.

ScriptEase enables users with no previous game authoring experience to define a setting (a default setting is provided but may be altered), to develop characters from a tool kit of qualities and characteristics, to compose multiple strands of dialogue with branching alternatives, to create plot events, and to refine default avatars and objects, thus enabling the creation of complex fictions (Carbonaro et al, 2005). Students created a digital story using this tool, and then wrote a related story in words.

McClay and Mackey took a qualitative approach to the project, asking the following research question: When students create fiction in digital game and written formats, what affordances and constraints do they demonstrate and/or articulate? In this article, we will discuss theoretical aspects of narrative tense, mood, and gaze relevant to the students' narratives; provide a brief overview of the project; report on the work of two students; and, finally, consider implications for theoretical understanding of narrative and for literacy education that this work suggests.

Theoretical Framing

In reviewing available literature, we were particularly interested in studies that explored the intersection where narrative games and written stories connect. The raw material of gaming has narrative potential, as we may see from machinima, 'home-made' stories created using the facilities of game engines. 'Machinima' means a hybrid of machine and cinema. 'Machinima refers to 3-D digital animation created in real time using game engines' (Jenkins, 2006, p. 152). Gamers making machinima draw on components of game engines such as 'sophisticated real-time graphics, physics, lighting, camera views and other facets of their games' (Lowood, 2006, p. 25); story creators also make use of 'script editors, level editors, and the like, along with resources, such as backgrounds, themes, characters, settings, etc. available in the game' (Lankshear & Knobel, 2007, p. 8).

The affordances are different, but there are some common generic narrative components involved in both written and digital stories. We explored this overlap and also investigated specific points of divergence that can be traced to the strengths of the different media.

The formats have some common characteristics. There are components of a story that are at least superficially similar in both game and written story. Dialogue reveals character and furthers plot in both formats. Each story is influenced by its setting. Plot events are both enabled and limited by generic conventions and expectations.

Such similarities begin to blur as we look more closely at the two formats. In a written story, there is normally only one instantiation of any particular dialogue, whereas the game supports alternate versions that may send the story in different directions. In our project, the creation of the setting actually worked quite differently in the two kinds of story: *ScriptEase* offered a default setting that was easy to augment but difficult to replace, whereas with words, no one setting was 'easier' to create than any other. Even so, the basic narrative elements of character, setting and (to a lesser extent) plot remained recognizable across the two forms.

There are differences, however. The points of divergence were in many ways more interesting, and much of the theoretical literature about narrative and games expresses these divergences in grammatical terms. Clues provided by verbal tense and mood were particularly telling and we found them pertinent to our analysis.

The idea of using verb tense as a genre marker is not new and can be traced back at least to the work of Susanne Langer (1953). Langer distinguished between a verbal narrative, which is always told in a virtual past tense; a lyric poem, which is created in a virtual present tense; and a drama, which she says is a story set in a virtual future tense.

Juul (2001) made a different kind of distinction, looking at the relationship between the moment of the story events, the moment of the telling of those events, and the moment of reception. Like Langer, he sets a verbal narrative in the frame of the past tense; the events have already happened by the moment of telling the story, and the moment at which the narrative is received by the reader is different again. A game differs from a verbal narrative because those three different points of time are collapsed: the events of the story do not get put together in a particular way until the moment of reception, when the player makes decisions that actively affect the outcome of the story.

Frasca actually relegates drama to the past tense along with story, and observes, '[S]imulation is the form of the future. It does not deal with what happened or is happening, but with what may happen' (2003, p. 233). The major difference between a game and a story, he says, is that, in the game, changes in the narrative options are possible *at the point of play*.

Burn (2006) discusses the distinction between narrative and game in different grammatical terms, referring to verb mood. A story, he says, is told in the indicative mood: this happened and then that happened. But a game is created by means of the imperative mood: 'you' are instructed to do something and then 'you' do something further, and the events fall out in reaction to your decisions.

Atkins (2006) talks about the nature of the 'game gaze' rather than the grammar of the action, but his conclusions, rather surprisingly, also lead back to questions of tense. What the screen holds, he says, is information about the past, about what has been achieved up to this point. But the player scans the screen with an orientation to the future, to see what potential actions are possible and what consequences are likely. We agree that when a player points, clicks and presses keys, some choices are made to affect the future. However, many choices are made to respond to the now, whether to change focus in the world, to evade a present danger or to take advantage of unique conditions of the moment, without thought of repercussions in the future.

Methodology, Data Collection and Analysis

We wished to explore how students would address and then articulate the composition challenges of creating a story in two different formats: digital game and words. The *ScriptEase* tool and its associated tutorial offered students a variety of options for characterization and setting in their game development, some relatively fixed and some open-ended. We were well aware that, for most of them, the tool would be completely unfamiliar and that they would be learning the basics and producing a result at the same time. All of these conditions meant that the game segment of the project was relatively more fixed.

The written story offered different conditions: students would be working with a familiar medium, words, and they would not be constrained by default options. We wanted to take advantage of this flexibility while encouraging students to make some connections between the two stories so that they could articulate comparisons between them. We also wanted to create conditions for story writing that would maintain some of the appeal of the game story, a framework of story creation that would have some vernacular grounding. To achieve these different ends, we established that the written story should relate to the game story in ways similar to the relationship between fan fiction and canonical fiction. We asked students to take any two characters from their game story and place them in their written story. Settings could be altered, plot details could be completely open-ended, but something of the relationship between the two characters must be maintained in the transition from game to print.

A class of 23 Grade 10 students from a middle-class, racially mixed school in a western Canadian city received intensive tutorial support in learning how to manipulate *ScriptEase* during a two-day workshop, held at the University of Alberta and supported by graduate students in the Department of Computing Science. At the end of the two days, most students had mastered the tutorial to the point that they had begun composing their story. They were given paper planning

sheets and a rough map of the game setting, of which they made variable use. They continued their game creation back in their school computer lab during three class sessions of 90 minutes each, during which time the technical support team continued to be available. They were also given the option of working over two lunchtimes in the computer lab, again with support. At set times, they saved their game story as composed to that point and submitted it to the teacher and the university liaison. At the end of this time, their games were collected.

For the written stories, students had only two class periods and two optional lunchtime sessions; a field trip reduced the class writing time for some students. Much of the story was written at home, as homework. Students were asked to save at intervals of 30 minutes and to submit multiple drafts of the story, as well as the final product. Therefore, neither story was produced in conditions that led to a polished final outcome, and not all the texts were completed to the authors' satisfaction.

Members of the research team observed the game story production activities, both at the university and at the school, and took field notes. There was less observation of the writing time. The field notes and the submitted written stories were used to select students for follow-up interviews, held at the school, recorded and transcribed. These interviews took place in front of a computer screen and students were invited to walk the interviewer through both the game and the written story, to talk about what kinds of decisions had been necessary, about what had to be omitted for various reasons, and about what they might do on another occasion. The interviews were conducted on the principle of 'sideshadowing' (Welch, 1998; Morson, 1994; Mackey, 1999; McClay, 2002), an interviewing protocol we have developed for encouraging writers to consider their composition options: what alternatives were possible at any given stage of the creation, why some alternatives were adopted and some were rejected, and what the implications of these decisions were for the final story.

The data set comprises in-progress and complete records of all 23 games and provisional and final drafts of all 23 written stories, the students' written planning sheets for the game stories, the researchers' field notes on the tutorial and game production processes, and the transcripts of the interviews with the selected students. In this article, we report in detail on two of these students.

We did a close textual analysis of the stories in both formats alongside each student's comments about the composition processes and their appraisal of the concluded stories. We explored the many options that students laid out in their games, and we also made use of a recording of a single instantiation of each game in order to clarify the flow of the story.

Two Student Stories

Andrea and Lana, the two students whose texts and perspectives we highlight in this article, were clearly engaged in composing their stories and were animated in discussing them. For each author, we will provide a short profile, summarize her digital story and written story, and provide some of her commentary on the experience of composing in both formats. The girls' digital games share the common visual template of the castle setting, which they, like many of their classmates, found restrictive. Within this common visual format, however, they create very different fictions. In discussing the digital games, it is difficult to describe the gender of the protagonist or player character, since a game player can choose to play it as a male or a female character. The game solves this problem by providing the author with a neutral pronoun that is replaced by a pronoun of the appropriate gender when someone plays the story as a male or female. Since English inconveniently has no singular neutral pronoun, we arbitrarily use the male singular pronoun to describe Andrea's digital story and the female to describe Lana's digital story.

Andrea's Stories

Andrea's family migrated from Bosnia-Herzegovina when she was five years old, and English is her third language. Andrea writes a journal and, occasionally, 'on rainy days', some fiction. She plays sports games on computer but not other digital games, and she chats online from three to five hours per week. She indicates that she uses the Internet for homework one to two hours each week.

Digital game story. Andrea's digital story begins with the player returning home to his castle in Lesteria, known now as the Kingdom of the Thirty Poisons. Since the death of the player character's father, the good King Lester, the kingdom has fallen into despair under the subsequent ruler, Queen Engala. The player character has returned to confront the Queen, and he must work his way through a number of rooms by talking with inhabitants and securing various tokens and artefacts. Castle dwellers explain that Engala has forced them into servitude with black magic. The player character eventually can gain access to the Queen's room to confront her; he knows that she has killed his father, King Lester, who was a good king. Ultimately, the player realizes that Engala is the player character's mother.

Andrea's digital game is massively verbal. She uses dialogue for exposition of past events and to establish characters. The cook, for example, explains the situation in the kingdom to the player character. Andrea laces in characterization with the exposition, as shown in Figure 1.

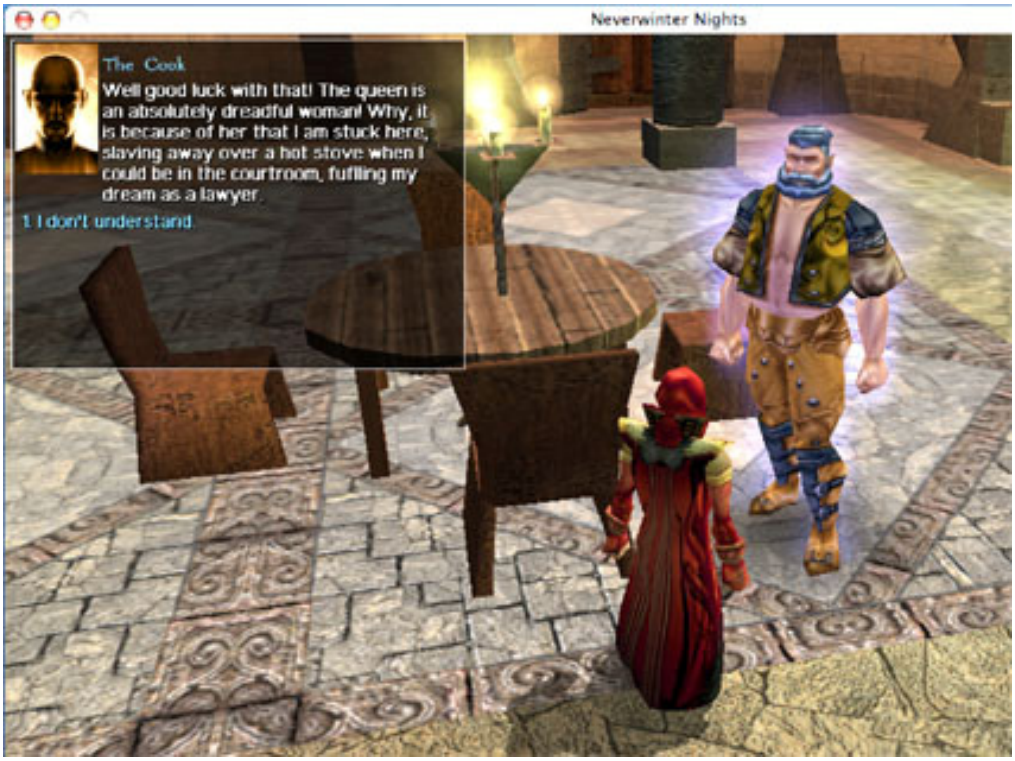

Figure 1. Part of a dialogue between the player character and the cook in Andrea's story.

> *Cook*: The queen is an absolutely dreadful woman! Why, it is because of her that I am stuck here, slaving away over a hot stove when I could be in the courtroom, fulfilling my dream as a lawyer.
>
> *Player character*: I don't understand.
>
> *Cook*: When Engala took over the city, she made a few 'changes' to the city. Commoners like me weren't allowed to hold jobs of importance. No, instead we were forced to become her personal slaves. But I guess I shouldn't be complaining. You should see what has happened to some of the others – I cannot even bear to say it.

Andrea creates branching dialogues to allow players to choose different paths through the story based on their responses to the characters they meet in the castle. She notes:

> I like the dialogue and how you could have two different dialogues going at the same time, kind of choose what you were going to say. I use that a few times with the guard and then with the cook as well. They all lead up to the same thing but you can have two different ways; they can be

> going in different directions. The character could be more rude or he could be more polite, so it all depends. It gives the player a bit more choice and that made the story a bit more special.

Written story. Andrea titled her written story 'The Secrets of Lesteria' and chose the name Matthias for the protagonist, noting later that in the written story, she had to choose a gender for the protagonist. The following excerpt occurs at the moment when Matthias enters his childhood bedroom:

> And there it was. A room that brought tears to his eyes like no other. A room that at one time had held so many memories, and was now reduced to nothing. His bedroom. As he entered the room, Matthias looked over each detail lovingly, his bed, his bookcase, his rocking horse from when he was but a baby. Simply being in the room brought such an overwhelming feeling of joy and misery, that Matthias was not able to contain himself. Instead, he broke down in tears, right in the middle of the room once part of the great kingdom of Lesteria.

As is immediately apparent, the written story focuses on the emotional import of the scene in a way that is much more difficult in the digital story. In a digital story emotion would need to be conveyed through dialogue or by using a technique called a journal entry that can be read by the player to fathom what the author thinks that player character should be feeling. However, the journal is often perceived as a secondary channel of communication since its reflective nature is often at odds with the immediacy of the game experience and players usually only check their journals when they are seeking guidance about how they should proceed in the story. In her written story, Andrea portrays emotional responses carefully, using details of the set pieces to establish the mood and the character's perceptions.

The contrast with her digital game story is also evident in her treatment of fight scenes. In digital game format, fight scenes are often the main focus of the player's attention. In the written story, however, Andrea glosses over fights quickly, dispensing with them in a sentence or two: 'After 10 minutes of intense fighting, Matthias, panting and covered in blood, finally defeated the guard'. She has an implicit understanding of what digital stories and written stories are 'good at'.

Andrea enjoys the multiple endings that are possible in a digital story and wants to employ that technique in her written fiction as well. She notes of her story:

> I'd want one ending where Engala [convinces Matthias] to go over to the dark side, into dark magic. There's another possibility that I actually included in my ending where she would take him captive and the story would just end there. And another ending was where he would overcome her and then avenge his father, what he came to do. So three possible endings there.

Lana's Stories

Lana writes a journal and some poetry. She is not a gamer and does not chat online. Like Andrea, she indicates that she spends about 1-2 hours per week on the Internet doing homework.

Digital game story. The player character arrives at a castle tired and seeking shelter and food (see Figure 2). Before these can be found, various obstacles must be overcome or destroyed. The game story proceeds with a focus on these obstacles and the tokens achieved by their destruction. The first obstacle, for example, is a gelatinous cube (from the original *Neverwinter Nights* tool set). Its destruction leaves a residue that is stored in the inventory as a cloak and is needed later. In several scenarios, the player can acquire something that is made available to her after overcoming an obstacle; that token's value is not immediately apparent, but it becomes essential to later progress in the story.

Even students who are not gamers understand the convention of taking whatever token is available, and Lana's game employs this convention adeptly. Lana comments on the limitation of the setting: 'I'd like a different setting. The castle is too cliché for a game. In an underwater setting there'd be more room to move around'.

In contrast to Andrea's digital story, Lana's story relies almost exclusively on action. The dialogue is much more sparse than Andrea's and serves mostly as exclamatory marks in the action sequences, such as when the player character booms, 'You *will* regret that!' to a creature that attacks her.

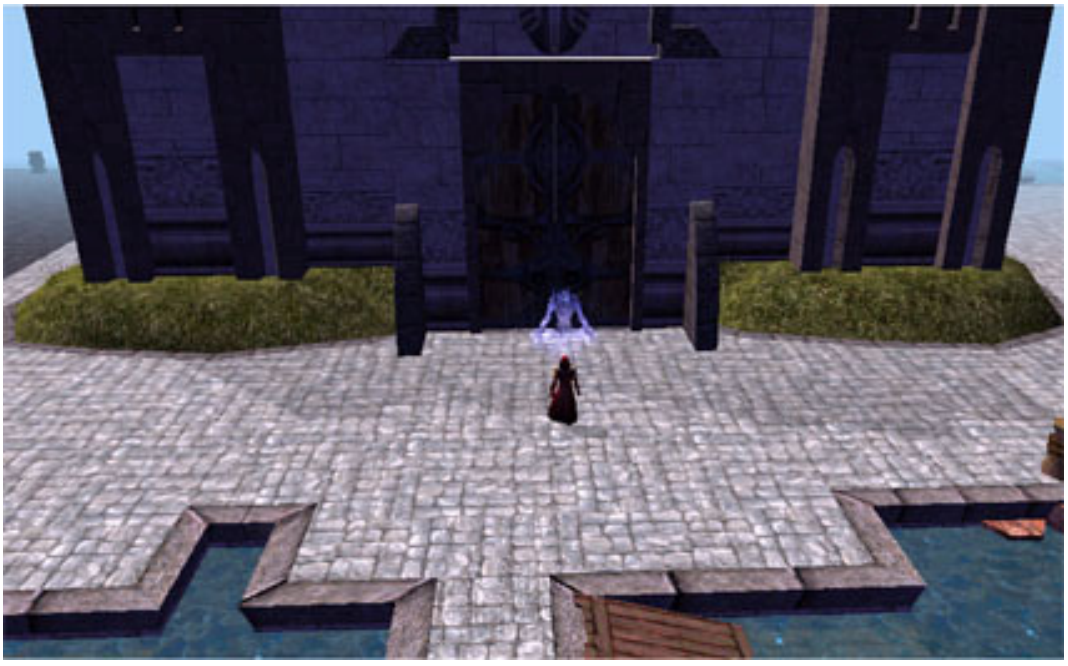

Figure 2. Exterior of castle in Lana's game story.

Written story. Lana notes that her written story, 'Enelya', makes a break from her digital game: 'I like how the game is kind of an interconnected web ... With the story I got out of the web and started a whole new thing'. In her opening paragraphs, Lana employs literary technique carefully:

> *It's so deathly quiet ... the only sounds you hear are your own heavy breathing and the echo of your footsteps on the cold stone floor of the castle. You can feel your heart beating; it feels as if it is going to burst out. You are tense, ready to react immediately, feeling with all your senses. You can see almost nothing except the blackness ahead of you; feel the cold drafts bristling your hair. You can taste the blood in your mouth from the bite on your cheek, and you can still smell the reek of that spider you killed ... You try to calm your pounding heart, and slowly open the door, feeling ready to face what lies beyond. The room is hot, as if a fire had been recently lit and put out. Smoke rises in front of you as you turn the corner round the wooden creates beside you, and –*
>
> 'NO! she screams, sitting up and looking around wildly. Her eyes are wide and terrified; she is breathing deeply and cannot yet grasp her surroundings. She looks around for comfort in the cold, round room, and finding none, rests her head on her knees and begins to sob. She is alone, more alone than she has ever been, and it is more horrifying than anything she has had to face in the last few hours. [Italics in original]

Lana notes of her digital game, 'I'd probably have the sense that I was the main character most of the time, so I sort of planned around that'. Similarly, in the written fiction, her use of the second-person opening is deliberately calculated to bring a reader into the immediacy of the action:

> I like how it's second person. I like having the reader feel like they're actually the person, like they're actually looking around and doing this, but it's actually a dream. I kind of like creating things like that so you can actually feel like you're doing it.

Lana produced four drafts of her written fiction, and she was pleased with the result, while commenting also that she needed more time to complete it to her satisfaction. (Students had less time for their written stories, and most students commented on what they would do with more time to create both stories.)

Discussion

Even these circumscribed snapshots of a complex composition project provide a glimpse into the rich potential for new insights offered by these young people. Our discussion will be divided into two sections: the implications for theoretical understanding and the implications for literacy education.

Implications for Theoretical Understanding

With the advent of the Internet and digital literacy, mainstream literacy practices are now more likely to include production as well as consumption. In all of the language arts, young people are now able to produce as well as to consume media representations, and they create works with increasingly sophisticated production values. Such professional-looking production may complement sophistication of expression, or it may mask naivety of expression. Young people's ability to create in the media in which they consume their aesthetic and ludic pastimes changes both their production and their consumption. The common DVD '*behind the scenes*' and '*the making of …*' features provide consumers with insider discussions about aesthetic thinking and decision making that arguably serve as tutorials for aspiring authors and filmmakers. Similarly, it is likely that digital games will change as amateurs join in producing them.

When learners acquire the capacity to produce their own texts they become able to present some of the tacit assumptions they have acquired but may not yet be able to articulate directly. If tense, mood and gaze are important components of game play, it should be instructive to establish how these girls draw upon the potential of these elements, both in the novel medium of game production and also in the familiar arena of story writing.

Surprisingly, although the short quotes we selected were not chosen to demonstrate these ideas, issues of tense, mood, and gaze are all evident in their composition. Lana's dream sequence offers an unusual prose example of second-person narrative with its implied imperative. Interestingly, the dream describes nearly every sensory mode *except* gaze: smell, taste, hearing, 'feeling with all your senses'. In the dream, it is too black to see – a condition that can perhaps be conveyed *only* in words since both games and films require a minimal level of light in order to communicate at all. Lana clearly makes full use of the sensory range and subtlety of words and plays overt or unconscious games with the affordances of the different media at her disposal.

Andrea's written account of Matthias in his bedroom emphasizes gaze but it is an explicitly *backward* gaze; in addition to incorporating emotions less easily dealt with in game format, she is offering an example of the past tense of print narrative. In both cases, the girls draw on the power of what words do well, and achieve an implicit commentary on what is more difficult to do with the different affordances of the game. Due to time constraints, most students were not made aware of how to use journal entries in their digital game stories. It would be interesting to determine whether this mechanism would be used to provide an equivalent *backward gaze* in their digital stories, or whether it would have been avoided, since it is so different from the immediacy of action that is so common in game stories.

It is important to remember that these girls were working on paired narratives. The telling of the same or related stories through a variety of media is a commonplace of contemporary culture, and these girls would appear to be comfortable with the idea that different media offer specific narrative possibilities. They move among plural options with ease and authority, and expect their players and readers to move as well. What discussion of *Harry Potter* or *Spider-Man* by today's adolescents would not include the pros and cons of representations, effects and other affordances or constraints offered by the books/comic book telling and the movie telling?

We set up our study to create opportunities to move between media in the composition of related stories, so we should not be surprised to find that the students made assumptions that the player/reader would encounter the story in both formats. Nevertheless, when we wrote in our research question the phrase, 'When students create fiction in digital game and written formats …', we were really thinking of providing two parallel and singular options (what will they do in the game, what will they do in the story?) What the participants in this study did was emphasize the plurality of the project, place particular mental emphasis on the '*and*' in that phrase, and create a fiction that needed both parts to be completely realized. This focus on a story that requires

multiple formats to be fully achieved was implicit in our challenge to the students but our own repertoire of tacit assumptions about storytelling had not truly made room for it as a fully articulated idea. The students had no such lacuna in their storytelling tool sets.

This small-sample study raises important questions and offers some interesting potential for further research. One area for further exploration involves the issue of how we may improve our understanding of digital narrative forms as the powers of production become as accessible as the capacity for reception. Another ongoing question entails developing a deeper understanding of the role of narrative plurality for a generation that has grown up from infancy with multiple versions of all their most popular stories.

Implications for Literacy Education

Andrea and Lana approach their first experience creating fiction in digital game format with expectations of multimodality in players' or readers' engagements with their fiction: they expect their audience to shift from one medium to another, and to experience the totality of the fiction by such movement across media and formats. What does such multimodal engagement say for the typical English language arts class, in which viewing the film of a novel or play is still too often the 'reward' for slogging through the print version? And what does this suggest for classroom interpretations of fiction of the future, in which the written does not necessarily have primacy over other formats and media?

The students we profile here implicitly understand the links across media and format for their creations of fiction and articulate their tacit knowledge in interesting ways. They understand the power of juxtaposing versions and expect that readers/players will encounter their fiction across multiple formats. Andrea's fictional world of Lesteria is best encountered in both formats, as she details the action sequences in the digital game and the emotional impact in the written story. Her digital game incorporates much dialogue, and her multiple pathways through that dialogue provide players with variation and control, as digital gamers would expect. Lana, similarly, employs a rarely used prose fiction technique – second person narration, more commonly encountered in video games – to bring more immediacy of action into her written story.

They both independently raise issues of tense, mood and gaze in relation to both game and written story. In so doing, they develop and perform tacit knowledge 'at the point of utterance', in Britton's (1982) phrase. The challenge for literacy teachers is to move this tacit understanding to the point of developing critical perspectives. Teachers who can help such students to bring their implicit skill sets to critical awareness will create rich opportunities for their students' growth in literacy.

In addition, both girls had explicit comments on the potential of each medium. In the written story, said Lana, 'the ideas were easier, like, because you can't create an idea in the game, it just happens, but in the story it's easier to create an idea about how it's going to work'. Andrea raised some of the reverse implications of this observation, saying, 'In the video game ... you can actually, like, see things coming ahead of you, but then with the story, it's a bit more difficult to picture it in your mind'. We did not have the opportunity to organize a discussion among the participants in this project but the pedagogical potential of such a discussion is clear.

In multimodal classrooms, teachers will capitalize on the excitement of having the literacy practices and concerns of their classrooms correlate to practices and concerns of the real literacy world. In allowing classrooms to be places where young people and teachers grapple with the changes and traditions of contemporary literacy practices, teachers will demonstrate the vibrancy and relevance of literacy to their students. By allowing such contemporary practices into their classrooms, teachers can help their students develop the critical awareness that is so often conspicuously absent from contemporary literacy environments. Teachers who hope to encourage students to value sophisticated literary techniques and expressions must be willing to engage with contemporary literary forms *as they are being created*; the current literacy environment affords many rich opportunities to play in literary forms as they evolve. And it may be that the excitement generated by new literacies affects everything done in the English classroom. As Andrea said:

> The game ... is a lot different than anything I've ever seen before, and it gives you so much opportunity, so many possibilities that you can do, and it makes it a lot easier, even for

> somebody who maybe doesn't like to write stories or, I dunno, who just really doesn't like to use a computer or whatever ... It kind of brings something new into their life, so then maybe they can, they'll find 'oh I like this' and then it brings them into that world and they can actually start to enjoy writing stories and stuff.

Nevertheless, the creation of such dynamic literacy classrooms is a tremendous challenge for teachers who increasingly must live in a social and educational climate that puts extraordinary, and extraordinarily misplaced, faith in high-stakes standardized assessment of students (and, often explicitly, of their teachers). Such assessments reflect literacy conventions of the past rather than those of the contemporary or near-future world. There is increasing evidence that these assessments do not allow students to demonstrate their literacy skills. Coiro (2006) notes, for example, that readers use strategies for online reading comprehension that are not included in traditional pen-and-paper tests of reading comprehension. Those capacities that teachers cannot discern, they certainly cannot assist students to exploit and develop as conscious strategies. So, implicit in this work with students is a reminder that teachers and other literacy educators must work to ensure that literacy assessment must link to 'real-world' literacy demands and conventions. Such work will be public, political, and contentious.

Conclusions

From the early days of this project, the research team has been struck by the importance of interdisciplinary networks for research and teaching in new digital environments. McClay and Mackey are substantially in debt to the more technologically sophisticated team members, whose development of digital games allows the team members with expertise in literature and literacy education to focus on our questions with an intensity that would not have been possible had we been responsible for the technology. Similarly, the Computing Sciences members of the team gained an understanding of the students' thinking and perspectives through the qualitative work of the literacy researchers. In a classroom context, such research projects would be unthinkable without the direction of digital gaming experts. Interdisciplinary teaming allows researchers and teachers alike to explore young people's engagement in complex multimodal environments. Although it is hard to develop and work in such teams, it is simply not possible for researchers or teachers to 'go it alone' to work in digital environments, and it is vitally important for the literacy education of young people that we delve into media and formats that increasingly shape their (and our) literacy lives.

The research and teaching that can and should be conducted in contemporary literacy environments will be exciting and relevant, both in terms of our understanding of narrative across media and formats, and in consideration of appropriate literacy pedagogy. As narrative in digital game format becomes more sophisticated and relatively simpler for amateurs to produce, researchers will continue to explore changing conventions of older formats. It is likely that readers' or players' expectations will affect the conventions of newer as well as more traditional narrative forms. Such changing conventions and forms will find their way into classrooms, where researchers and teachers will grapple with their implications.

Literacy education is contested in contemporary schools, and teachers struggle to teach well despite competing demands of parents, administrators at all levels of schooling, and the general public. Teachers are often expected to make such education uncontroversial and based on traditionally sanctioned syllabi and methods – an impossible demand if they are to engage young people in literacy. Instead, teachers themselves must engage in newer literacy environments beside their students. They need to take account of student perspectives and think together about narrative and changing ways of telling stories. In so doing, they are best positioned to make useful connections between traditional and newer forms of literacy, offering the benefit of their greater experience of older forms while considering newer forms with young people and raising the critical questions that are so important in every form of literate practice. The coming generations will undoubtedly develop different sensibilities and tastes in communicative conventions. If teachers do not engage in newer forms with their students, they will lose the opportunity to influence young people's thinking. Teachers who engage with contemporary and developing literacy environments

with their students will gain the rewards of such exploration, helping to shape the literacy sensibilities of the next generation.

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