

Early Adopters: Playing New Literacies and Pretending New Technologies in Print-Centric  
Classrooms

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Abstract: In this article, semiotic analysis of children's practices and designs with video game conventions considers how children use play and drawing as spatializing literacies that make room to import imagined technologies and user identities. Microanalysis of video data of classroom interactions collected during a three year ethnographic study of children's literacy play in kindergarten and primary classrooms reveals how the leading edge of technology use in print-centric classrooms is pretended into being by 5-, 6-, and 7-year-old "early adopters" a marketing term for first wave consumers who avidly buy and explore newly-released technology products. *Early adopters* signals two simultaneous identities for young technology users: 1) as developing learners of new literacies and technologies and 2) as curious explorers who willingly play with new media. Children transformed paper and pencil resources into artifacts for enacting cell phone conversations and animating video games, using new technologies and the collaborative nature of new literacies to perform literate identities and to strengthen the cohesiveness of play groups.

„Children have to lead a life and move toward a conclusion that is unknown and if the adults are going to understand the world in which they live, they have to look at the children whose experience is different from their own. It doesn't mean the children know more than adults; it simply means that children know more about living in the present day world than adults because the adults grew up in such a different world.

--Margaret Mead (in Peck, 1988)

### Early Adopters in a Changing World

In the past decade, New Literacies Studies (Street, 1995; Gee, 1996) have documented a proliferation of multimodal ways of reading and writing with dynamic technologies (Lankshear & Knobel, 2003): text messaging with cell phones, instant messaging with email (Lewis & Fabos, 2005), podcasting with MP3 players, animating characters in video games, designing avatars for computer-enabled virtual worlds, among many others. These studies show that many preteens and adolescents are expert users of digital media in innovative intermediate and secondary classrooms where they nimbly multi-task (Leander & McKim, 2003) and navigate complex digital networks and interactive environments.

....and although young people may not in reality be quite as *hyper-literate* as some theorists fantasize, it is part of the common sense surrounding the computer that young people today are more computer literate than preceding generations. (Sefton-Green, 1998, p. 10).

In early childhood classrooms however, new literacies and technologies have received a mixed reception. While most preschool and kindergarten children have access to computers in school (Labbo, 2006), children's meaningful use of technologies is limited when hardware is in short supply, outdated, and/or equipped with minimally interactive software that perpetuates "old literacy" practices (Sefton-Green, 1998) such as

...letter recognition, skill sharpening, and enhanced fluency with reading and writing conventional linear texts via use of word processing software, drill and skill software,

electronic early reader books, audio software functions for matching sounds to letters, authoring software and so on. (Lankshear & Knobel, 2003).

In some classrooms, early childhood practitioners have adequate resources and readily integrate new technologies to enrich literacy curriculum. Others report that they have equipment but feel that they are unprepared and lack the necessary experience to successfully use technology in their teaching (Labbo et al., 2002) with over fifty percent of kindergarten and primary teachers self-identifying as technology novices (Chen & Chang, 2006). In these classrooms, technology may become a “benign addition” (Cuban, 2001, p. 67), an accessory for entertainment or supplemental activities while the “real” curriculum is delivered through traditional paper and pencil activities. Whatever the reason, whether new technologies are outdated, locked away, or in the corner gathering dust, young children in many early childhood classrooms are missing opportunities to explore contemporary literacy resources with rich potential for making meaning with visual, animated, and embodied literacies.

However despite print-centric and technologically-restricted classrooms, young children are using play as “a literacy of possibilities” (Wohlwend, 2008) to create spaces for imagining themselves as 21<sup>st</sup> century multimedia users. Mediated discourse analysis of excerpts from a three year study of literacy play in kindergarten and primary classrooms demonstrates that children are accessing new literacies through pretend play—a transformational semiotic practice and multimodal resource that is readily available in early childhood classrooms—to explore unavailable multimedia such as cell phones, iPods, and video games. In this article, I suggest the leading edge of technology use is pretended into being by 5-, 6-, and 7-year-old “early adopters” a marketing term for first wave users who avidly buy and explore newly-released technology products (Rogers, 1983). I intend my use of the term *early adopters* to signal two simultaneous identities for young technology players: 1) as developing learners of literacies and technologies

and 2) as curious explorers who willingly play with new media. In some classrooms, children's attitudes toward multimedia contrast sharply to those of surrounding adult "laggards" (Rogers, 1983) the marketing term for reluctant technology users who wait until the end of a trend before adopting a product . How are young children leading the way into new literacies through multimodal semiotic practices with available classroom materials (e.g., drawing and play with crayons, markers and paper) to explore practices with electronic devices in times of mushrooming technologies and New Literacies?

### Research on New Literacies in Early Childhood

A long history of early literacy research (Whitmore, Goodman, Martens, & Owocki, 2004) shows that young children's transactions with text, whether with electronic screens, product packaging, published books, or marks penciled on paper, involve practices that are semiotic, multimodal, and social (Kress, 1997, 2003; Rowe, 2008; Siegel, 2006). Early research conducted by Jerome Harste, Carolyn Burke, and Virginia Woodward (1984) interpreted preschoolers' mark-making and approximations of print through a semiotic lens, finding meaningful intent in children's inventive production of signs with multimodal symbol systems. In Peircian (1931) semiotics, meanings are represented by signs (representational media) in three ways:

- as icons in which the representational material resembles some sensory quality of the represented idea,
- as indexes that point to or recall an aspect in the history of the represented idea,
- or as symbols that have no physical or historical connection to the represented idea but have an arbitrarily assigned association.

In *Before Writing: Rethinking the Paths to Literacy*, Gunther Kress (1997) showed that children extend and enhance meanings by moving signs across modalities, as they make a single sign using multiple practices with varied media and mediational means—drawing a car, coloring or painting it, cutting it out, writing logos on it, making engine sounds, and animating it by driving it along the floor.

Recent research examines how children’s sign-making extends to computer keypads and screens, showing that children transform the content of meanings of the signs they make, whether on-screen or on paper, through playful manipulation of the relationship between the signified object, the signifying graphic, text, or gesture, and the resulting meaning (Labbo, 2006). Families provide children with scaffolded experiences in “technoliteracies” (Marsh, 2004) through which children learn to manipulate devices including computers, cell phones (Gillen, Gamanossi, & Cameron, 2005), and game consoles (Pahl, 2005) while they explore practices with email (Wollman-Bonilla, 2003), text messaging, and computer games. Each device and literacy practice evokes expectations for automatic performances of particular tacit conventions that signal user competence and technologically savvy identities (Gee, 2007). For example, video games genres include first person shooter, role-playing games, action, adventure, and fighting genres. Features of game play vary according to each genre, following conventions for roles, settings, path designs, goals, and strategies. In the central vignette in this article, children play an invented video game using paper and markers that appropriates elements of a fighting genre Playstation video game, “Digimon Rumble Arena” (Bandai, 2002) in which two Digimon characters duel on a platform, as players empower the fighters with various ways of attacking, blocking an opponent’s attacks, and self-healing. Digimon. Each Digimon is associated with either fire, water, or nature. Players use this knowledge to strategically plan each

move as Digimon characters are less vulnerable to attacks composed of their associated elements.

Knowledge about genres and conventions of multimedia texts integrates into schooled literacy in writing classrooms when children are encouraged to write about their interests (Dyson, 2003; Kendrick & McKay, 2004; Leland & Harste, 1994). Jason Ranker's (2006) case study showed that children's use of video game conventions dramatically influences character development and story progression in drawings and writings produced during writing workshop. When Adrian, an eight-year-old boy, drew and wrote about a Nintendo-64 video game, *Gauntlet Legends* (Midway Entertainment, 2000), he introduced characters in visually complex ways through drawings produced prior to the written text but minimally described within the story action. The story progression also did not follow the expected pattern for narrative fiction: problem—conflict—resolution; rather, the story built upon a video game goal for sustaining play, enabled through game conventions that regenerate the story following climatic events and create portals to the next, more complex level.

...the character's actions are designed to resist narrative closure.... If the central character were to be defeated by enemies, thus "dying," the narrative would come to an end. Rather than bringing his narrative to an end, Adrian perpetuates it by advancing to a new level and then initiates a similar sequence of events (although different each time) at the higher level. (Ranker, 2006, p. 28)

James Paul Gee (2007) offers an expanded and critical examination of the semiotic domains of new technologies and new literacies. Using the example of video games, he suggested that we look beyond an internal perspective limited to game content such as characters, narrative, and game progression. Rather, a critical examination requires an expanded view that includes an external social semiotic perspective to see how meanings are constructed through valued practices among a group of players. In a review of early childhood research on

computer-related technologies, Michelle Knobel and Colin Lankshear (2003) identify a paucity of socially situated research in which literacy is viewed “as competent handling of texts that are meaningful to ‘insiders’ of particular sociocultural practices and discourse communities” (p. 75), noting a handful of early childhood studies that take this critical perspective on new technologies.

...the overwhelming emphasis is on using [multimodal] resources to promote abilities to handle conventional alphabetic print texts rather than to *generate* multi-modal texts and to understand principles of making multi-modal meanings. This skew is understandable given current literacy policy directions that continue to insist on the predominance of alphabetic text and, moreover, to approach literacy education with an assumption that high proportions of learners will actually have to *struggle* to become encoders and decoders. From our perspective, this trend is most unfortunate. Apart from anything else, it entails an absurd ‘under-realization’ of the potential of new technologies to orient children toward literacy futures that will be very different from the past. (p. 77).

The research reported in this article blends internal and external perspectives in its *sideways glance* (Kendrick, 2005; Schwartzman, 1978) at play from a player’s perspective that reveals the social power in play and design practices which have more currency in the peer culture than in the official school culture. When desired technology is not at hand, children can use drawing and pretense to invent it. Children’s flexible use of mode in their writings or multimodal *designs*<sup>1</sup> (Kress, 2003) blend texture, color, shape, sound, and action to produce signs or objects that mimic reality. In this article, expanded and critical analysis of children’s practices and designs with video game conventions considers how children use play and drawing as spatializing literacies that make room to import imagined technologies and user identities.

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<sup>1</sup> For the purposes of this article, the term *design* refers to embodied practices that produce images and artifacts and the term *writing* refers to embodied practices that produce printed or handwritten text. However, in lived lives, the boundaries are blurred as texts, images, and artifacts all constitute multimodal texts. I also intend my use of the term *design* to be consistent with social semiotic definitions (Kress, 1996; New London Group, 1996) in which design refers to planful action that appropriates conventions and reconfigures power relations.

## Method

### *The Research Context*

The kindergarten and first grade vignettes featured in this article are excerpted from a larger study of literacy play in kindergarten and primary classrooms. Following case study methodology (Dyson & Genishi, 2005), I used purposive sampling (Merriam, 1998) to locate classrooms with rich examples for closer study, asking knowledgeable informants in three school districts to recommend specific classrooms with child-directed literacy-play periods. To evaluate the play- and print-richness of each classroom, I used early literacy classroom environment scales (Loughlin & Martin, 1987, Wolfersberger, Reutzler, Sudweeks, & Fawson, 2004) and a play checklist that I developed to assess the accessibility and variety of play materials. The examples of literacy play in this article occurred in kindergarten and first grade classrooms in two public elementary schools in the Midwest United States. Teachers in these classrooms identified as developmentally appropriate (Bredekamp, 1987) constructivist (DeVries, 2001) teachers. The early childhood curriculum in both schools provided opportunities for play in kindergarten and primary classrooms during daily learning centers where the teachers facilitated to encourage exploration, peer negotiation, and collaboration. Computer labs and expensive technological hardware were available in both schools but early childhood classrooms had low priority, receiving equipment that intermediate classrooms no longer needed: outdated and off-line computers with minimal software.

Skills practice software and low-level hardware in these classrooms meshed with administration high-stakes literacy targets. Although in different districts and 60 miles apart, teachers in both schools expressed concern over increasing pressure to raise literacy scores on standardized assessments that affected teachers' curricular decisions. For example, a mandated literacy intervention program in one district targeted a single reading strategy each year (e.g., a

year-long emphasis on weekly lessons to develop the comprehension skill “summarizing”). Over time, teachers scaled back inquiry themes with technology components and play periods to make room for direct literacy instruction focusing on daily comprehension lessons with basal reading materials. This narrow interpretation of literacy disintegrated rather than integrated curriculum, positioning play, inquiry, and new literacies as separate from, and less-valued than, isolated literacy skills.

Like many early childhood classrooms that I observed, children’s most frequent independent use of technology in the kindergarten and first grade classrooms involved listening to books or songs on cassette through headphones connected to a tape player. Technology access was tightly regulated with children’s computer use limited to 30 minute weekly sessions in the computer lab. Children were not allowed to independently access non-assigned applications, to view online webpages, nor to send email. Those children who brought cell phones, hand-held video game players, or MP3 players to school stowed them away in backpacks and only used these devices on the playground and after school.

#### *Data Collection and Analysis*

During visits to the classrooms, I observed, took fieldnotes, videotaped, and transcribed children’s small group interaction to capture the flow of talk and action that accompanies young children’s literacy events. I analyzed the ethnographic data from these visits using mediated discourse analysis (Scollon, 2001; Scollon & Scollon, 2004) to locate the tools, materials, and places where children combined reading, writing, playing, and designing practices (Wohlwend, 2009b). Selected excerpts from videotapes were transcribed to highlight content themes and interaction patterns during small group activities. In keeping with the research focus on participation, I coded the children’s activity at the level of a *collective meaning-making event*,

that is, the group activity that constituted collective meaning-making within a given classroom location from the moment the first child arrived and picked up materials to the moment the last child left. Using emergent coding consistent with mediated discourse analysis, I located collective events where intersections of play and design transformed meanings and players' identities in ways that affected their participation in affinity groups (Wohlwend, 2009a). An *affinity group* (Ferne, Kantor, & Whaley, 1995; Gee, 2007) was created when children chose to play together based upon their common interests and activity preferences. During collective events, children produced artifacts that were analyzed for signs (icons, indexes, and symbols) and modes. Multimodal discourse analysis (Jewitt & Kress, 2003) tracked transformations of signs across modes: aural (speech, sound effect), visual (image), and manual (gesture, object manipulation). Collective events were microanalyzed using mediated discourse analysis to understand how children combined play and design to keep play going, to clarify the meanings of shared pretense, to construct social bonds, and to strengthen the social cohesion of affinity groups.

### Playing and Designing Cell Phones and iPods

#### *Transforming Meanings: An Internal Perspective on (Pretended) New Technologies*

Play is a particularly powerful transformative tool that can be viewed internally (e.g., the play narrative, imagined characters and props, and sequence of pretended events that happen within a play scenario) and externally (e.g., the who-plays-what negotiations that keep play going, the classroom culture, and players' social relationships) (Schwartzman, 1978). Children use play to recontextualize here-and-now reality and to flexibly reshape meanings of immediate objects to fit their own purposes, in this case, to access technologies that were not present in the

classroom. In play, children learn to detach the conventional meaning attached to a concrete object in the immediate context and reattach a new meaning better suited to their play scenario (Vygotsky, 1935/1978). In the example pictured in Figure 1, a girl in the housekeeping corner of one of the kindergartens wanted to pretend to call a friend but all the toy phones were in use. She immediately picked up a plastic carrot, held it next to her ear, and began chatting with her imagined caller.

Figure 1. Transforming meanings through play: Carrot as cell phone

Play allows children to test the limits of an object's meaning. Play meanings are motivated not only by an individual's intended purpose but also by the iconicity of the physical properties of materials. A plastic carrot bears an iconic resemblance that allows it to function as a cell phone: it's small, narrow, and can be hand-held. A toy banana would probably make a good stand-in as well. However, the emphatic roundness of a plastic apple limits its credible use as a phone. A social semiotic lens (Hodge & Kress, 1988) reveals that children strategically manipulate the materials at hand to make *motivated* signs, inspired by available materials and children's social interest. Children emphasize certain modes or choose materials for their sensory qualities to make their signs more effectively represent their intended meanings and carry out their social purposes. In the hands of a child, any material object in the physical environment can be used to create meaning, including toys—commercial or child-made—or literacy materials such as pens, paints, and paper.

In their designs, children identified the essential attributes that conveyed the idea of a cell phone and invented an approximation of its physical features with the materials they found at hand (Kress, 1997, 2003). For example, the boy in Figure 2 created a flip phone out of a folded

piece of paper. He gave an oblong piece of paper rounded corners and penciled a 3 by 3 array of squares below a much larger square to represent a numeric pad and an LED screen. Additional phone features (receiver, compact size) were emphasized by adding play actions: he held the opened paper flat in the palm of his hand, raised his hand to his ear, talked into the paper for a few seconds, then snapped it shut with one hand, and tucked it into his pocket.

Figure 2. Transforming meanings through design and play: A paper cell phone

As demonstrated with carrot or paper cell phones, children are flexible, inventive, and strategic meaning-makers who do not strictly adhere to convention. Children look at the world as potential signs-to-be-made; their sign-making and sign use is more likely to be governed by their interest and an object's material qualities than by attention to established linguistic or visual conventions (Kress, 1997, 2003).

*Transforming Practices: An External Perspective on Play, Design, and New Literate Identities*

As semiotic domains, play and design can be viewed externally for meanings that are situated in the shared social practices of affinity groups (Gee, 2007). The children in this play scenario shared an understanding of playful recontextualization that allowed other players to recognize the carrot as a phone, recognition accomplished nonverbally through action without explicit definition ("This is a phone") or metaplay communication ("Let's pretend this is a phone"). Such tacit recognition is the hallmark of networks of backgrounded, valued practices that mark membership and elicit the automatic cooperation of others within a particular community of practice (Scollon, 2001).

Play and design allowed children to strategically appropriate available materials and produce artifacts to approximate the valued media practices they saw in constant use in the

glocalized environment (Marsh, 2006). For example, the kindergarten boy in Figure 3 approximated his own iPod using materials that were “to hand” in his classroom. After gluing two pompons to a pipecleaner, he used a piece of yarn to attach these headphones to a paper controller, complete with dial and an LED screen display that read “Thomas and Friends,” a children’s television program whose main character is a train engine. His pretense also allowed him to import popular culture into a school setting, to play with his media passion (Marsh, 2005), and to perform a masculine fan identity (Newkirk, 2006).

Figure 3. Pretending to listen to “Thomas and Friends” on a designed iPod

### *Play, Design, and Transduction*

Multimodality fueled the transformative properties of reading, writing, play, and design. Each semiotic domain is linked to a primary modality: language and reading to auditory modes including speech and sound-effect, reading, writing, and design to visual modes including gaze and image, and play to action modes including gesture and movement. Transformations happened through *transduction* (Kress, 1997), fast-paced movement of a sign across modes. For example, the act of cutting out a paper cell phone involved a process that changed image into artifact by producing an edge that establishes spatial boundaries and a shape that enabled manipulation in three-dimensional reality. Transduction enriches meanings when children transform flat paper representations and bring them into the world of action as three-dimensional props for play performances. When Dustin drew a cell phone on paper, he created an image for viewing; when he cut out this image, he turned the image into a object that could be used to talk to others, to signify coolness, and to create a tangible sign of social capital through an affinity object (Ferne *et al.*, 1995), an object desired by other children that he used to display status and

that inspired imitation in the classroom peer culture. Examples of transduction through play and design practices included:

1. representing *texts* by transforming ideas into streams of auditory information or two-dimensional image displays
2. constructing *artifacts* by transforming materials into three-dimensional objects
3. enacting and animating *identities* by transforming oneself into an imagined character through performance
4. recontextualizing *spaces* by transforming contexts into imagined places or times

Play and design practices allowed children to transform an object's or action's meanings by using particular modes to move signs across dimensions of time and space. Using physical objects and semiotic tools, children transformed ideas into material forms and produced durable messages that can be shared and transported (Brandt & Clinton, 2002).

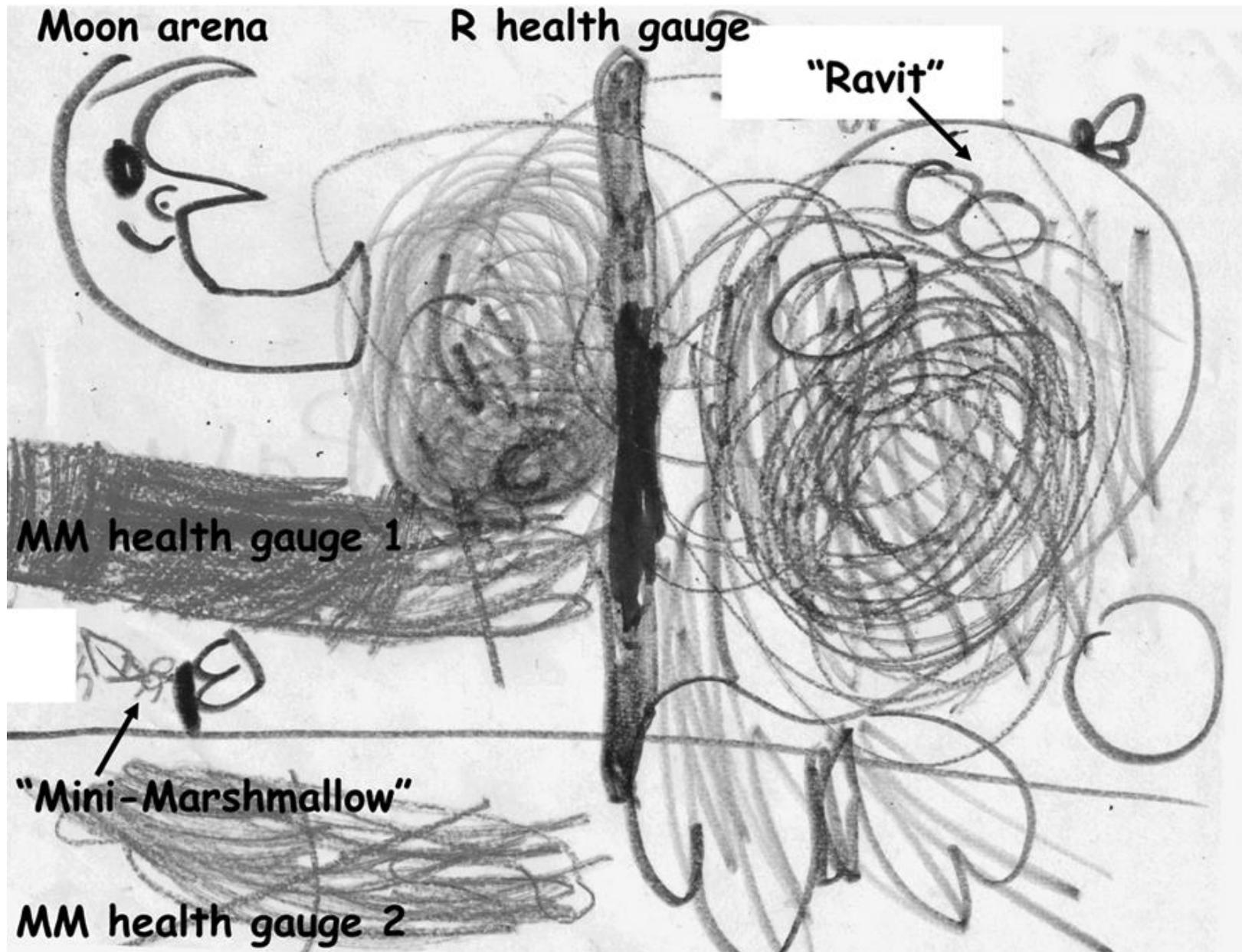
### Playing and Designing a Video Game on Paper

#### *An Internal Perspective: Modes, Meanings, and Strategies Inside the Game*

When children draw and play together as they do when they enact a video game on paper, another modality—action—is engaged allowing players to interact with each other, to co-construct interactive meanings as well as social space to carry out peer-valued practices. In the following vignette, two first grade boys play an invented game that resembled “Digimon Rumble Arena,” a two player fighting genre. The players invented various weather-related moves to attack, defend, rebound, and heal in order to deplete the opposing character's “health” or ability to keep playing. The goal of their game was to be the last player who had a viable character (i.e., some remaining quantity on its health gauge or “life bar”) by causing the opposing character to run out of health. Figure 4 shows the drawing that the boys produced by playing a video game on paper: The domain of Kirby's tiny character “Mini-Marshmallow” (the character names and

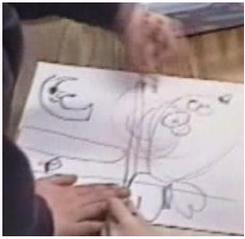
game elements were also invented by the boys) covered the left half of the paper; the domain of Ian's large character "Ravit" covered the right side of the paper. Ian's moon shape in the corner designated the "Moon Arena" as the setting for their battle.

Figure 4. Paper at End of Video Game (with added labels)



As is often the case with young children's designs, the end product of the boys' game (pictured in Figure 4) masked the complexity and the development of strategic moves that were only visible in the process of play. As I watched the game unfold, I realized that the boys were co-constructing and negotiating a collective meaning that was almost completely inaccessible to me, despite years watching my sons as they played video games as teenagers. The coding scheme in Table 1 takes an internal perspective to closely examine and understand the modes, strategies, and meanings constructed during one turn in the boys' pretended video game.

Table 1. Internal Perspective on Play and Design: Modes, Meanings, and Strategies Inside the Game

Interaction Turns/Game Turns & Modes				Strategies & Meanings			
<i>Turn</i>	<i>Speech Mode: Aural</i>	<i>Image Mode: Visual</i>	<i>Action with Object Mode: Manual</i>	<i>Strategy</i>	<i>Meaning within Game</i>	<i>Effect on Character's Health ( Game Objective)</i>	
IT/ GT	Talk & Sound Effect	Drawing & Photograph	Gesture & Handling	Move	Character Action	Mini Health	Ravit Health
IT 12  GT 2	Kirby: Fire Tornado!	Circling scribbles 	Kirby makes large circles that cover Ravit character	Offense	Mini attacks Ravit with fire tornado	Almost 100% of health bar remaining	100% of health bar remaining
IT 13  GT 2	Ian: sshshshspshpshpsssh		Ian raises crooked pointer finger and points to fire tornado scribbles	Defense	Ravit extinguishes fire with water before it consumes him		
IT 14  GT 2	Kirby: You're, you're defected [affected] by fire?		Ian colors with black marker while Kirby watches him.	Record effect of attack	Ravit's health is diminished greatly	Almost 100% remaining	20% remaining

In Table 1, interaction turns 12-14 represent the speech, image, and action that comprised the second turn in the game, following an opening attack by Ian (comprising turns 1-11, not shown). In Turn 12, Kirby's counter attack began with a circling gesture that mimicked swirling tornadic action. First circling the orange crayon above the paper before touching down, Kirby rapidly moved his crayon in overlapping circles on paper, emphasizing and concretizing the violent, messy, and spiraling nature of tornadoes as he laid down loops of orange crayon. The selection of an *orange* crayon was strategic, iconic of flames and indexical of danger (e.g., construction danger signs). In Turn 13, Ian responded to Kirby's fire tornado attack, crooking his finger as a fire hose and pointing it at the fire tornado coloring; he animated his fire-dousing gesture with iconic sound effects "sshshshspshpshpsssh" that signaled the sounds of rushing water and hissing steam. In Turn 14, Kirby watched Ian color away 80% of Ravit's health and expressed surprise at the devastating effect that his fire tornado attack had on Ian's character. In the next two turns, Kirby took steps to repair his opponent's health and to strengthen the bond between players, efforts that make no sense when interpreted within the combative context of the fighting game. Instead, an external perspective is necessary to understand how the boys cooperated while competing as they coordinated opposing goals: winning the game while prolonging play and sustaining friendship.

*An External Perspective: Modes, Social Space, and Player Identities Outside the Game*





As in Ranker's (2006) study, attempts to interpret video games using the conventions of narrative fiction (or even the conventions of traditional card games with dueling match play such as "War") fall short. In a linear, competitive, and individualistic interpretation, Kirby should defeat Ian's character quickly to resoundingly win the game; the quicker the defeat, the greater the victory. However, Kirby repeatedly attempted to strengthen Ian's character, with an offer and demonstration of creating additional health bars in Turn 20 and with verbal admiration in Turn 26 that constructed Ravit as a formidable opponent, "Whoever wants to face me, they're gonna face one with Rav!" Both strategies were very effective in maintaining play group cohesion by keeping a co-player from becoming discouraged or quitting and in sustaining their shared play theme by opening potential avenues for prolonging the game with mutually regenerating health bars. In Turn 25, Ian took up Kirby's idea but with a twist. He used "moonlight," a healing strategy directed at his own character. Ian scribbled waves of S curves over Ravit and then recolored his own health bar, pressing hard to "erase" the previous gray-black scribbling and thus restore Ravit's health (so that the lighter black coloring on the bar was moved backward to indicate health depletion from about 80% to about 30% in Figure 5).



Figure 5. Ravit's health bar refilled

With both characters strengthened by regenerating health bars, play continued until Game Turns 8 and 9 (Table 3) when Kirby won, but then abruptly found a way to lose.

Table 3. Contrasting Internal and External Perspectives on Ending Turns of Pretended Video Game

Interaction/Game Turns & Modes			Strategies & Meanings			Social Space & Player Identities			
<i>Speech Mode: Aural</i>	<i>Image Mode: Visual</i>	<i>Action with Object Mode: Manual</i>	<i>Strategy</i>	<i>Meaning within Game</i>	<i>Effect on Health</i>	<i>Effect on Social Space</i>	<i>Player/Character Identity</i>	<i>Projected Identity</i>	
IT 52 GT 8	Kirby: Fire tornado		Kirby scribbles with rapid orange spiraling over Ravit character	Offense using strongest attack	Final attack; Ravit will lose	Mini 60% left; Ravit 5% left		Kirby as Mini	
IT 53 GT 8	Ian: pwhpwhpwhpwhpwhpwh hpwh		Ian scribbles in jagged up and down strokes over Ravit/ right side of paper.	Effect of Offense	Ravit has lost	Ravit 0% left	Agrees with effect of attack	Ian as game attack effects sound	Ian as loser; Kirby as winner
IT 54 GT 8	Kirby: Are you defeated? Who's gonna defeat me?		Ian colors in last empty space on Ravit's health bar.		Records defeat of Ravit		Game will end		Kirby as bereft winner
IT 55 GT 8	Ian: Da-↓do-↑da-do-da-da-do::o↑ [Tune signals game over]		Ian leans back in his chair.	Game Over	Concedes defeat; Game Over		Game finished; Group finished	Ian as game sounds	
IT 56 GT 9	Kirby: You get that that fire tornado's defeated me 'cause that, because you had armor on. Ksh:. Ksh:[Ksh:. Ksh:		Kirby crosses out Mini's health bars with large Xs, each stroke on each X is punctuated by sound effect.	Self-destruct by rebound off armor	Records defeat of Mini; Surprise ending	Mini 50% left; then 0% left	Game finished; Play group cohesion restored	Kirby as Mini	
IT 57 GT9	Ian: [I didn't have armor. I didn't have [armor.			Game over	Break-down of meaning	Restore health to Mini	Team defeat denied	Ian as Ravit	Denies attributed move
IT 58 GT9	I Kirby: [I accid'ally used <b>armor</b> fire tornado.		Kirby steps away from table.	Error caused loss	Surprise element by Mini	Mini stays at 0%	Team defeat retained	Kirby as Mini	Claims error

From an internal perspective, Kirby reused a previously devastating attack that ensured Ravit's defeat, but then inexplicably killed his own character after victory. In an informal interview following the game, Kirby verified this: "... first I gave him armor and then when I shot by tornado, it got him down and then it came back to me and got mine down." However this ending makes more sense when viewed from an external perspective that considers social relationships and the potential for future play: Kirby found a way to soften his friend's loss. Kirby engineered a simultaneous defeat for both characters by having Mini succumb to a ricochet effect caused by "accidentally" giving armor to his opponent. When Ian objected that Ravit had no armor, Kirby maneuvered around his objection by claiming to have accidentally used a special armor-producing fire tornado attack. By ending the game in mutual defeat, Kirby opened the possibility of rematch and decreased the possibility of Ian refusing to play another round. The loss inside the game strengthened the cohesiveness the boys' group outside the game, maintaining a social space where the two boys could continue to display expertise and affiliation with the gendered (masculine) community of practice surrounding computers and video games (Marsh, 2004).

What Can Literacy Teachers and Researchers Learn from Early Adopters' Play with Pretended New Technologies?

### *Appreciating New Texts*

In this study, children's explorations with new technologies highlight the generational divide between print literacy practices as individualistic product-oriented craft and new literacies practices as co-constructed and collaboratively-maintained participatory process.

Indeed, interacting with a game or other digital texts, from CD-ROMs to online World Wide Web sites, is qualitatively different from the relations between reader and writer in the domain of print literacy. Central to this area of concern, then, is

the problem of defining *interactivity*... If a fixed relation between writer and reader is the hallmark of the old literacy then an interactive dynamic is at the heart of the new literacies. (Sefton-Green, 1998, p. 10).

Some researchers of new literacies suggest that by valuing children's knowledge and skill with video games, teachers can create bridges from out-of-school literacies and family "funds of knowledge" (Gonzalez, Moll, & Amanti, 2005) to schooled forms of writing. However, such bridges should at least be bidirectional so that teachers can also learn to understand and value the new forms that children are already writing, a necessity for implementing curricula that supports "literacy of fusion" (Millard, 2003) of old and new literacies. For example, trying to transform this video game play episode into a piece of writing for writing workshop exemplifies the "'new wine in old bottles' syndrome...fitting new technologies into classroom business as usual" (Lankshear & Bigum, 1999, p. 455) by attempting to constrain the boys' divergent, messy collaboration and fit it into the narrow, logical progression of a storyline. A single writer crafting a personal narrative, mediated by peers and teachers within a supportive writing workshop embodies the print literacy values of individual production and personal creativity. In contrast, the new literacies values of sustained collaboration and collective cohesion are embodied by multiple players cooperating with interactive media to sustain a fluid and reactive text, in which print is almost absent and actions communicate as much information as images. Video games produce nonlinear and dynamic interactive texts (Carrington, 2005) as opposed to the linear and fixed narrative texts (beginning, middle, end) typically generated through story-writing in an elementary school writing workshop (Ranker, 2006).

Interactive, immersive texts, like video games, arguably leave more control over the narrative in the hands of the player or reader than do traditional texts. Unlike the written version of Adrian's story, the player (or "reader") of a video game is responsible for making decisions along the way that affect the outcome of the narrative. Because of their qualities of interactivity and immersion, video games produce *nonlinear* narratives.

Video game play merged the boys' individual play and design moves into a joint text that blurred the line between reading and writing as each interpreted the other's move and produced a counter move. Kirby and Ian's pretended video game show that new texts require coordinated action. In writing workshop, a single author produces a book with support from others who consult but do not produce the text; responsibility for production is alleviated but always individual. In video games, the text is co-played, always under construction, and responsibility is shared as two or more people must participate to jointly produce the text-in-process. The features of new texts "—non-linear narrative structure, quite distinctive spatial layouts, ongoing and cumulative challenge levels, multiple and interactive cueing systems" require literacy users who take risks and experiment to sift through potential solutions (Carrington, 2005, p. 19).

### *Adopting New Views of Childhood*

The spaces played into being in this article demonstrate how young children used multimodal literacies of play and design to produce ruptures in school spaces compressed between nostalgic "back to basics" fundamentalism and Rousseauian romanticism. In classrooms such as these, teachers struggled to maintain inquiry-based integrated curricula and comply with mandates to deliver isolated skills instruction. The print-centric task-intensive focus in school literacy and reductive accountability trends left little instructional time for multimodal explorations. Ironically, the narrow focus on covering a static set of literacy skills is juxtaposed against an expanding "new textual landscape" (Carrington, 2005) of diverse literacies and rapidly emerging technologies.

Indeed, electronic culture is already an integral part of early childhood experience for most youngsters. As we are all being pushed onto the on-ramps of the information superhighway, I think it is crucial for educators at all levels of schooling to take charge of reshaping curriculum and pedagogy in relation to

[information technology]. If we don't, corporate software developers will maintain their control over content design that invariably shapes how and what we teach. (Luke, 1999)

Anne Haas Dyson (2006) calls for a new set of basics, informed by children's lived experiences, their diverse cultural and linguistic resources, and their rapidly expanding repertoires of symbolic conventions. In the classrooms in this study, teachers scrambled to make curricular space for experiential learner-centered "hands on" curriculum that expects children to interact directly with "real" materials (although real usually meant plants, insects and small animals, books, handmade artifacts from home; multimedia and technologies were rarely considered as "real"). The romanticized cultural model of the young-innocent-in-need-of-nature as depicted across centuries from *Emile* (Rousseau, 1762) to *Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder* (Louv, 2008) further distanced our youngest learners from access to new technologies that are part of their world.

It is as if the developments in young children's lives outside of nursery and school are occurring within a self-contained, virtual bubble that has little to do with the stuff of the first years of schooling, which generally continues to focus on phonics, print-based literacy texts and canonical narratives. In contrast, ... family spaces are complex spaces in which globalised narratives are localized on a micro-level, public and private boundaries blur and there are no hard-and-fast rules about 'real' and 'virtual'. This is the techno-territory of family life in the twenty-first century and unless early years educators acknowledge the rapid changes which are taking place, the curriculum offered to many of these 'toddler-netizens' (Luke, 1999) will continue to offer outmoded and irrelevant reflections of their lived realities, rooted as they are in ever-changing mediascapes. (Marsh, 2006, p. 23)

Children at play are particularly adept at identifying and recreating features of cultural importance to a community, including the familiar literacy forms, tools, and practices that children experience every day in 21<sup>st</sup> century family life. Shrinking opportunities to play coupled with early education's sluggish acceptance of new technologies required these early adopters to check their new literacies at the classroom door. Despite these barriers, children found play

spaces for exploring technologies, demonstrating their awareness of emerging forms of being literate, accessing unavailable tools with their own credible designs, and enacting believable performances of the valued literacy practices that they observed in their everyday worlds.

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