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Bringing Maker Literacies to Early Childhood Education

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Literacies are proliferating at a rapid pace as new ways of making meaning become possible with the advent of powerful technologies and innovative practices. This is especially evident in makerspaces (Peppler & Bender, 2013) where new forms of literacy emerge in encounters with digital media (e.g., filmmaking and animation) and manufacturing technologies (e.g., sewing, woodworking, and robotics). Museums, libraries, after-school clubs, and other out-of-school spaces offer informal learning spaces for children and youth in an ever-expanding network of youth makerspaces.

Despite this burst of innovation outside schools, classrooms in the United States look eerily similar to classrooms of the last century, perhaps the chalkboards have been replaced with whiteboards, but the books and seatwork paper-pencil lessons remain squarely situated in traditional literacy practices. However, a quick scan of the playground in those same schools reveals a lively peer culture, enlivened and circulated by digital media that fills children's new textual landscapes. We know from our ongoing literacy playshop research with young children in early childhood classrooms that popular media toys are an important resource for children's media production (Wohlwend et al., 2013; Medina & Wohlwend, 2014; Wohlwend, 2015, 2016). When children are given an opportunity to play together at school, their play often turns to making as they pause to make props for their characters:

from paper crowns for Elsa and Anna (Disney's *Frozen*) or fashion a cape for Thor (Marvel's *Avengers*) from a play kitchen tablecloth. It has also become evident pre-service teacher training must better prepare teachers to respond to the student's interests in popular culture, play, and making. *Maker literacies* (Wohlwend et al., *in press* 2017) that include popular media, toyhacking, and creating films can be included in literacy practices if pre-service teachers develop an understanding of their value and place within the literacy curriculum. How do we tap into the creative potential of play and making interests in a way that aligns with school literacy goals? How could early literacy curriculum and instruction expand to incorporate making into primary literacy methods courses?

This study documents maker literacies pre-service teachers used when a "play, toyhacking, and filmmaking module" was added to their primary literacy methods class. The pre-service teachers completed this module during their literacy methods course at the university. The main purpose was to encourage pre-service teachers to transform and expand their notions about what counts as literacy and literacy curriculum in early childhood education.

Theoretical framework

Play is a literacy that creates action texts (Wohlwend, 2011), stories enacted with bodies, toys, props, and puppets rather than print on paper. During play, players collaborate and pretend scenarios or "as if" worlds (Holland et al., 1998), attaching agreed-upon meanings to bodies, materials, and actions (Vygotsky, 1978; Thiel, 2015). The notion of toyhacking in this article enables redesign of toys' and puppets' materials but also their embedded texts (e.g., characters, narratives) (Rowsell & Pahl, 2006). Digital technologies save and document play and open further opportunities for redesign through video-editing.

In Literacy Playshop, four processes contribute to children's meaning-making with media: play, storying, collaboration, and production. While the three levels move inside-out and back again, the four processes are represented here as loosely-defined domains so there is no production sequence or curricular "cycle" but rather recursive connections spreading across domains in multiple and unruly directions. Each of the four processes contributes a critical, productive, and

interdependent aspect of meaning-making that also links to a larger curricular field: drama, literature, diversity and community, and media and cinema arts (Wohlwend, et al., 2013, p. 46).

Methods and research context of the study

This project is excerpted from a five-year study on literacy play, the data from this particular study documents the 'play, toy hacking, and filmmaking module' added to four sections of a PK-3[1] early literacy methods course at a US Midwestern university. Three instructors and about 140 university students participated in this project. Data sources include video of pre-service teachers' toyhacking and filmmaking, the films they made with their fellow university students and their hacked toys, the elementary student's films, and post project reflective blog entries written by the university students.

We used mediated discourse analysis (Scollon & Scollon, 2004; Wohlwend, 2007, 2014) to analyse students' and children's making and film production, tracking collaborative meanings and shifts in participation. Video analysis identified and coded maker literacies and patterns of improvisation and collaboration in the agreed-upon meanings of characters and props as well as roles for students as toy animators, camera crew, directors, musicians, and sound effect synthesizers through the process from toyhacking to video-production. Mediated discourse analysis filtering identified moments of collaborative transformation (e.g., agreements to change characters' texts, the emerging storyline, or students' production roles). Transformative clips were triangulated with students' reflective blog posts (e.g., value of maker literacies in class and in later filmmaking with children in field experiences).

Findings

The sessions progressed in three stages of media pre-production, production, and post-production: toyhacking and character development, storyboarding and filming, and video-editing and sharing.

Participants began the pre-production module by deconstructing familiar characters and narratives of popular culture toy franchises, such as Barbie and Star Wars. They looked closely at each toy to identify its commercial franchise, its character traits and filmic narrative,

and the material messages in its materials. Toys are designed with anticipated identities (Wohlwend, 2009), that is, companies produce toys and games with a particular consumer demographic in mind. This guides the selection of colours, textures, shapes, and other material decisions about toys and products in order to appeal to boys or girls or age groups of children.

In this study, as university students examined a commercial mass media toy, they pondered questions like,

- What is the toys intended text?
- Who is the toy intended for?
- Who could be left out by this toy?
- What could I do to change the toy's text?

Following this critical deconstruction, the participants proceeded eagerly down the hallway to visit the university's designated maker-space where they worked to modify toys' popular culture texts, social meanings, and the material features. In this space students were given boxes full of inexpensive commercial mass media toys that they cut, glued, painted, combined, and otherwise decorated.

When newly revised characters emerged, the participants worked in small collaborative groups to create a storyline for their toys. Through

Image 1 & 2. Sally and Linus telling a new story.

collaborative negotiation and improvisation, stories were enacted and filmed as students animated the toys with hand movements. Once the film footage was gathered, students worked together to share their expertise to edit the short films using the iMovie app on iPads. Most groups added voice-overs, captions, music, sound effects, setting backdrops, and textual elements. Upon completing the editing process, students shared their films with the entire class.

Pre-service teachers expressed enthusiasm about the project through comments such as, "It was a blast!" and "I was surprised by how much fun I had". They also predicted they would incorporate playful making and filmmaking in the future, saying that they felt very engaged in the process and could see value in doing similar activities in their own classrooms someday. One participant explained,

> The day of class that we made our toys and filmed was one of the most fun days of college I have ever had. Even just putting together the toys stretched my brain into ways it was not used to; having to break things apart and put them back together. I can definitely see students boosting their imagination and creativity through this process. I also can see students enjoying the filming and editing because they love technology so much.

In the following weeks, during their field placements, the pre-service teachers dedicated two sessions to working with a focus student to share their hacked toys, create child initiated stories, build props and sets for them, and film their stories. In a third session with their child, the team worked together to edit their original films and celebrate their accomplishments. Upon reflection, many pre-service teachers wrote about how the activities opened doors for creativity and meaning making. One noted that the creativity followed their child home,

> When I came in today, the teacher informed me that Max[2] had so much fun that he went home and made his own toys for our time together this week. They were made of clay and they matched the colour scheme and shape of the hacked toys we brought in two weeks ago. I was so excited that instead of just watching the finished film we also made a new film with his toys and our extra time. Needless to say, I think it was a really successful experience for both of us, and I would definitely try to implement similar projects in the future!

While children are participating in collaborative socially constructed new literacies constantly in out and of school spaces, these participatory literacy practices typically are not welcomed in school. We currently live in an age of accountability, in which, the central driving force of education is increasing standardized test scores (Cochran-Smith & Lytle, 2009). Top-down policies about schooling bring scripted curricula, data driven teaching practices, standardization, and little room for exploring new literacy practices. We hope that by introducing this creative play, toyhacking, and filmmaking module to literacy coursework that pre-service teachers will find value in the practices and create spaces in their future classrooms for expanded literacies. A majority of the university students, found that participation in the module legitimised an alternative conception of meaning making. Many of the university students completed this project with reflections that expressed strong commitments to using maker and digital literacies in their future classrooms.

Throughout this project, active engagement and collaborative participation was evident as the university students expressed their excitement about creating new characters and producing digital stories. Many of the pre-service teachers noted that they were initially sceptical about maker literacies and their place in literacy instruction. One student reflected,

> Had I seen the makerspace before this class, I would have probably thought that it seemed out of place [in a college of education]. After the assignment, however, I realize its huge potential.

This potential, for literacy instruction, student engagement, involvement, and collaboration, was referenced by a many of the participants, and often was accompanied by reflections of transformed understandings. Many students responded with positive comments,

> I think this project was a really great way to introduce a different kind of literacy learning. While I can only hope my future school has a space for my students to be this creative, I definitely hope to do a film making process of some sort with them, hacked toys or not. I also think they will enjoy working together to come up with the funniest, scariest, silliest, or most clever movie they can think of. Creativity is essential, and this project hands the opportunity to use their imagination to them.

Image 3. These toys were hacked, but their gendered storyline remained untroubled.

As university literacy instructors, we noticed increased laughter, smiles, and enhanced engagement from our students when we compared makerspace activities with the traditional literacy activities encountered throughout the semester.

Multiple and fluid transformations of the toys' texts occurred through maker literacies in toyhacking, collaborative storying, and media production. Pre-service teachers commented that the ability to create new toys without the traditional marginalizing effects was empowering and fun. Many students pointed out that the toys that they created reflected their worlds more appropriately than the often-exaggerated gender coding of pre-packaged toys. A participant explained, "I loved creating my own toy, that was gender neutral. I purposely chose a usual male dominated toy, a Flintstone dinosaur, and a Hello Kitty doll toy bank to work with".

It is interesting to note that while the participants were encouraged to change the narratives of their toys by hacking them, we also found that the pre-service teachers relied on their own shared knowledge of popular media culture to recreate familiar stories for their characters. Often, these remixed stories (Ito, 2007) did not look at the appropriated text critically, but instead reified stereotypes. Pre-service teacher's talk, jokes, and films tended to reproduce stereotypical toy texts, gendered roles, or popular culture tropes. For instance, one group of six participants developed a film that mimicked *Monty Python and the Holy Grail* (1975). In planning for their film they relied on their shared media knowledge. Despite that the characters had been hacked, the film provided the basis for remixing a commonly-shared and socially understood text. Even though the characters were different, the gendered storyline was not troubled.

Seeking popular culture and social media tropes peers would easily recognize was evident across many of the filming groups in all classes during the literacy module. Groups gained inspiration for their films from popular music videos, damsel in distress tropes, and viral videos. But students can also hold fond memories and other emotional commitments to these shared texts, making them difficult for groups to revise. Children have strong passions for beloved characters and favourite stories that anchor their story making. One pre-service teacher observed this tension in remixing with his focus child,

> He did find the (hacked) toy much more interesting, but even though it was a half horse/half man with a *Peanuts* head [Woodstock], he still automatically decided that the toy was in fact simply a weird-looking Batman. The story that he created was a classic story about Joker being a bad guy, and Batman saving the day. He was somewhat creative in explaining that Joker was "disguised," and adding in the "sneaky Penguin" who was Joker's accomplice, but in general, his story was very much like popular culture stories we had read about before.

A great strength of this project is that the university students were able to actively consider their assigned elementary child's media interests and funds of knowledge (Moll et al., 1992) as they were hacking their toys. In addition, they welcomed children's toys and popular culture connections from home into their field experience activities. Allowing

children's favourite storylines and narratives into the classroom validated each child's interests.

The enthusiastic reactions from the children who participated in the project indicated the time spent creating digital films was fun, collaborative, productive, and engaging. Many pre-service teachers noted changes in their focus child's participation level and in their engagement in story making. One university student wrote,

> My student had a blast filming and wanted to make a part two to the video. She was so excited she asked if we could do it next time too. She liked telling stories and I feel like it allowed her to express her emotions. She loved that she was able to do impromptu and make up the story with no restrictions. Overall, I thought this was a great experience and I was able to learn new ideas from it.

Another pre-service teacher noted,

> The move from traditional school literacies to newer ideas of literacies certainly engaged the student – he was enjoying himself but also working diligently to produce a story and a film.

Importance for engaged learning in and out of school

If literacy is a socio-cultural activity then we must provide students with opportunities to create meaning together. The image of children sitting alone, writing at desks needs to vanish. It is through projects like this one that invitations to co-construct can emerge and we can expand our notions of a solitary writer and reader into collaborative makers and producers.

Maker literacies are best supported by playshop models, which expand reading and writing workshops to include play-enriched new literacies curricula. (Wohlwend, 2011, 2013; Wohlwend & Peppler, 2015). The playshop model empowers children to collaboratively produce with digital literacies and new technologies. These literacies will require new kinds of teaching and learning by practitioners in and out of classrooms. While this article has documented learning in a university classroom and elementary school field experience, the learning and teaching applies to out-of-school sites such as museums, arts, after-school programs, and so on. Other practitioners could similarly

visit a makerspace, engage in toyhacking, and experience the power of collaborating creatively, producing digital stories, and exploring the potential of expanded literacies.

We know it is critically important to offer children engaging activities that matter to them. Maker literacies validate children's interests and passions, promote student generated ideas and stories, and allow for co-creation of collaborative texts in socially significant ways. Playshops and maker literacies reveal the exciting possibilities in teaching for collaboration, creativity, storying, technology, and placing play at the core.

Notes

1. Pre-kindergarten (also called Pre-K or PK) is a classroom-based preschool program for children at or below the age of five in the United States, Canada and Turkey. An applicant for PK3 must be three years old by Sept. 30. https://en.wikipedia.org/wiki/Pre-kindergarten

2. All names are pseudonyms.

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