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LATINO/A CHILDREN’S DIGITAL LITERACY ACCESS AND ONLINE READING SKILLS	2
THINKING ABOUT PROFESSIONAL LITERACIES WITH MATHEMATICS, ENGLISH LANGUAGE ARTS, AND SCIENCE PRESERVICE TEACHERS	41
CO-CONSTRUCTING PLACE, SPACE, AND RACE: AFRICAN AMERICAN AND LATINX PARTICIPANTS AND RESEARCHERS’ REPRESENTATIONS OF DIGITAL LITERACY RESEARCH IN THE SOUTH	61
GENERATION GAP BETWEEN STUDENTS’ NEEDS AND TEACHERS’ USE OF TECHNOLOGY IN CLASSROOMS	99
MEXICAN-AMERICAN TRANSNATIONAL JUNIOR/HIGH SCHOOL STUDENTS: CROSSING BORDERS THROUGH NEW MEDIA LITERACIES	124
THE VIRTUAL COMMUNICATION ASPECT: A CRITICAL REVIEW OF VIRTUAL STUDIES OVER THE LAST 15 YEARS	172
ONLINE COMMERCE AS A DIGITAL LITERACY: A GROUNDED THEORY APPROACH.....	219

Latino/a Children's Digital Literacy Access and Online Reading Skills

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Abstract

This mixed methods study explores digital literacy opportunities and online reading skills of Latino/a children, grades three to eight, in a South Texas school district along the U.S.-Mexico border. New Literacy Studies constituted the overarching framework, with cognition and social justice as supporting theories. Participants were 310 children and five staff members from the *Futuro* school district. Data sources included a two-part digital literacy survey, interviews, field notes, learning logs, and public domain data from *Futuro*. Although most participating children enjoyed access to working computers and high-speed Internet at home, the majority demonstrated low computer and online reading skills. Most reported limited school work related to the development of digital literacies, especially the new literacies of online research and comprehension. Implications relate to a more complex definition of the digital divide that includes computer access and use, critical digital literacy, and online reading skill development.

Keywords: digital literacy, new literacies, online reading, digital divide, Latino/a

Introduction

What digital literacy access and skills do Latino/a children of poverty possess in and out of school? How does access relate to their online reading and comprehension skill development? This mixed methods study examines these research questions for Latino/a elementary and middle level children in a South Texas school district, located at the Mexican border. We explore 310 youth participants' digital technology access and skills in and out of school, focusing on basic computer skills and online research and comprehension.

Our study is significant because Hispanics represent 17% of the U.S. population and the third fastest growing racial group. With a projected increase of 115% by 2060, Hispanics will constitute 29% of the U.S. population (U.S. Census Bureau, 2015). One in three Hispanics (33%) include school age children, compared to one in five (20%) of the white population (Fry & López, 2012). While the U.S. government uses the term *Hispanic*, we prefer the term *Latino/a* when discussing our participants, who have more ties to Latin America rather than Spain. About 74% of this city's population is of Mexican origin, according to the city's website. Thus, we present national data of the Hispanic population, but refer to our participants as Latinos/as.

Besides expanding populations, learning more about nondominant youth is important for other reasons: poverty and academic achievement. For example, Hispanic and Black children face the most difficult economic challenges of any U.S. child population (Children's Defense Fund, 2011). In 2015, the Pew Research Center statistical report indicated 25% of U.S. Hispanics live in poverty, with an annual average income of \$21,900 (Stepler & Brown, 2015). Educational attainment is also limited among Hispanics. About 20% of American-born and 49% of foreign-born Hispanics do not possess a high school education or equivalent (Brown & Patten, 2014).

However, 92% of Hispanic registered voters stated education was extremely or very

important, followed by jobs, the economy, and healthcare (López, González-Barrera, & Krogstad, 2014). This group's academic achievement has been such a travesty that Gándara and Contreras (2010) called it the Latino education crisis. Therefore, research in schools and districts serving large numbers of Hispanic children represents a national issue.

When addressing out-of-school technology access to develop digital and critical literacy skills among non-dominant youth, we found little research. Watkins (2011) underlined the importance of Latinos/as' and African Americans' digital literacy practices to develop academic, civic, critical, and social skills. For example, youth contributed to a public memorial of a homicide victim to critique racial and social class inequalities (Watkins). For many years, Morrell (2015) engaged public urban youth in digital documentary films and research, which augmented their critical reading skills. Students joined cyberactivism communities of their choice and participated virtually and face-to-face in rallies, community forums, and protest marches. This youth action research took place for six summers (Morrell, 2008); one participant wrote, "I can no longer read text without questioning it" (p. 155).

Regarding school-based digital experiences and skills, Warschauer and Ware (2008) described Project *Fresa* [strawberry], which focused on harsh fieldwork conditions in California. With the scaffolding of two teachers, the elementary students, 80% Latinos/as, generated survey and interview questions, conducted interviews, and created charts, graphs, and spreadsheets of their findings. They emailed elected officials and strawberry growers about their concerns. The pupils findings to California community members and parents, also. Through these experiences, the children gained valuable cognitive, critical thinking, and communication skills.

Similarly, two Canadian high school instructors involved indigenous students in generative, critical digital narratives. The adolescents explored issues of oppression, privilege,

race, and identity through a collaborative written report and digital video. According to the principal investigator, Pirbhai-Illich (2010), “Engaging students required tapping their interest in using electronic media, accepting their lived experiences, and inviting them to use their funds of knowledge in multiliteracies” (p. 264).

Developing reading, writing, and collaborative skills is essential for 21st century college and workplace success (Partnership for 21st Century Learning, 2007). Thus, to give digital technology increased attention, we position it as a literacy issue; educational policies should include information and communication technologies (ICTs) to support literacy practices and the development of new literacies (Leu, O’Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009; Castek, Coiro, Henry, Leu, & Hartman, 2015). We perceive digital technology as part of new literacy studies (Gee, 2007) because technology and literacy inform each other (Karchmer, Mallette, Kara-Soteriou, & Leu, 2005). Indeed, literacy involves “a malleable repertoire of practices” related to social transformation (Luke, 2005, p. xi).

Digital literacies relate to “socially situated practices supported by skills, strategies, and stances that enable the representation and understanding of ideas using a range of modalities enabled by digital tools” (O’Brien & Scharber, 2008, pp. 66-67). Digital literacy tools include ICTs, video games, wireless interfaces, and other hand-held devices (Skudowitz, 2009). Information and communication lines intersect, as we can locate information on a mobile device, smartphone, or tablet and can engage in strategic play in a game with someone far away using Wi-Fi and cellular data. Yet, digital literacy and online reading skill development require more than simply placing tools in children’s hands. This is because digital literacies involve collaboration, engagement, and meaning (Kalantzis, 2011), in addition to information consumption, creation, critique, and production (Lankshear & Knobel, 2006). Therefore, digital

literacy skill development requires higher-order thinking (Churches, 2008) as well as application and practice in complex digital environments supported by ICTs.

Theoretical Perspectives

New Literacy Studies (NLS) traditions guided our inquiry. This overarching theoretical perspective focuses on evolving notions of context-based literacy practices, including technology-infused contexts, with a variety of multimodal texts (Gee 2000). Within NLS, we examined data from cognitive and social justice lenses because we were interested in the digital access and online research and comprehension skills of low SES Latino/a children.

New Literacy Studies

Our research is part of NLS theory because we interpret digital skills and use as ways to enhance contextualized literacy practices (Gee, 2007; Stolle, 2008). Leu and colleagues have spent more than a decade defining and refining a new literacies perspective from a cognitive approach (Leu, Kinzer, Coiro, & Cammack, 2004; Leu, Kinzer, Coiro, Castek, & Henry, 2013; Castek et al., 2015). These approaches focus on the development of online reading paired with higher-order thinking skills, ranging from synthesizing to critically evaluating information.

Cognition

Building upon this body of NLS theory and research, we aligned our definition of digital literacy skills to focus on the new literacies of online reading. More specifically, we focus on the new literacies, which include strategies and skills “required to identify an important question directing the author to locate, critically evaluate, synthesize, and communicate information with the Internet” (Castek et al., 2015, p. 325). See also Henry (2006). The revised Bloom’s taxonomy includes verbs, not nouns, to demonstrate the role of learners in constructing their own knowledge. These cognitive skills involve remembering, understanding, applying, analyzing,

evaluating, and creating (Churches, 2008). Thus, a cognitive framework includes schema building, cognitive strategies, engagement, and analysis and relates to students' 21st century career and academic success (Kivunja, 2014).

We utilized a taxonomy of cognitive skills, from basic Internet searches, navigation, and email, to more advanced Internet-based searches. The latter include the process of locating information on the web, information synthesis, and critical evaluation (Castek et al., 2015). In the following section, we explain how these skills are not neutral from a NLS perspective.

Social Justice

As social justice scholars under NLS, we explored access to new literacies and underlying social inequalities reproduced in that access (Freire, 1970). Literacy encompasses access, design, diversity, and domination (Janks, 2010). We relate access and design to what children do with technology. We connect diversity and domination to structural inequities that low socioeconomic status (SES) Latinos/as face. For instance, teachers from high SES districts are more likely to assign Internet-related homework than low SES districts (Henry, 2010). Additionally, teachers and students from wealthy districts had significantly higher mean scores on an assessment of online reading comprehension. See also Henry (2007).

NLS relates to these social justice issues. Luke (2005) considered the NLS commitment to "education as a force for a more equitable redistribution of social goods, power, and capital" (p. xiii). Next, we perceive literacy as contextualized and ideological, not neutral (Barton & Hamilton, 1998; Gee, 2000; Street, 1993, 2003). For example, children may possess many digital skills, but if these skills involve only entertainment, friendship through social media, and information consumption, these children will not be as academically prepared. Furthermore, much depends on children's academic digital access and mentoring in school and in out-of-

school contexts. Therefore, we employed a social justice lens because of systemic inequities (Freire, 1970) and inaccessibility to digital resources, especially for impoverished youth and Latinos/as. Low SES schools tend to possess less instructional technology than wealthier ones (National Center for Education Statistics, 2010). Furthermore, teachers in the former hesitate to assign digital work, believing children lack access (Bussert-Webb, 2014; Warschauer & Matuchniak, 2010).

Regarding out-of-school access, Latinos/as do go online as much as other groups (López, González-Barrera, & Patten, 2013). However, many experience interrupted services, logistical issues in finding public access, and non-functioning devices (González, 2016). Bussert-Webb and Díaz (2012) found most Mexican-heritage youth in a low SES neighborhood did not get broken hardware replaced and did not know who could service their equipment. Irreparable tools not only impact youth's digital literacy access; the former also relate to digital skills, as youth cannot develop digital skills with unusable equipment.

Research Methods

This section focuses on our research site, participants, data sources, procedures, and data analyses; all methods connected to our theoretical frameworks.

Setting

This study took place in *Futuro* [Future], pseudonym for a South Texas school district and the largest employer south of San Antonio. Having a school district, versus a business or university, as the biggest employer demonstrates the city's poverty level and economic standing. Additionally, the city surrounding *Futuro* sits alongside the Mexico border and is the most economically strapped U.S. city (U.S. Census Bureau, 2010). *Futuro*, with approximately 50,000 students and over 50 schools, is one of the poorest U.S. districts; 95% of *Futuro*'s students are

economically disadvantaged and qualify for free and reduced price school meals as part of the National School Lunch Program. According to the district's website, 65% of the student population is at-risk; 33% are considered limited English proficient.

Despite these challenges, *Futuro* has won several state and national awards for student achievement on high-stakes tests as part of No Child Left Behind (NCLB) requirements (U.S. Department of Education, 2002). *Futuro* boasts a student attendance rate of 96%. The Texas Education Agency (2015) rated 80% of *Futuro* schools as recognized or exemplary, based on attendance, retention rates, and state-mandated test results.

Participants

We gathered data during an after-school enrichment program for *Futuro* children, identified as at-risk for school failure in five elementary schools and three middle schools, grades three to eight. Of approximately 1,400 children in the after-school program, 114 middle level and 196 elementary students turned in signed, matching parent consent and child assent forms (n=310). About 87% of the children self-identified as Hispanic on Digital Divide Measurement Scale for Students (DDMS-S); however, we believe this percentage should be much higher. *Futuro*'s website indicates a 99% Latino/a enrollment. Moreover, during survey completion, participants asked Bussert-Webb what *ethnicity* and *Hispanic* meant, although the survey questions contained definitions and examples of each. Some youth with Spanish first and last names asked Bussert-Webb if they were Hispanic, Asian, or Black. Of the 310 children, 18 participated in interviews with Bussert-Webb and at least 150 (about half) completed learning logs. Perhaps more participants completed the logs, but the number was difficult to determine because some did not type their names.

Staff interviewees included four female and one male staff member (five total) who had expressed interest in digital literacy or who taught technology during the after-school program. Two staff members were site coordinators and the other three were technology teachers; they had the same job titles during school and for the program. Site coordinators interacted with teachers during the school day and had opportunities to observe classroom instruction. All five staff members self-identified as Latinos/as. The only male staff participant taught at the middle level; all others were females at the elementary level.

Data Sources

We used a mixed methods approach to cross-reference quantitative and qualitative data sources. We administered a two-part DDMS-S, which assessed computer access and use as well as digital literacy and online reading skills (Henry, 2007). We included child and staff interviews, children's learning logs, and documented field notes, also.

For quantitative data, we administered the DDMS-S to determine children's technology access and skills across three constructs: 1) Internet access inside and outside school, 2) Internet use inside and outside school, and 3) Internet reading skill as a measure of online reading comprehension, derived of two dimensions, reading to locate information and reading to critically evaluate information. An exploratory factor analysis (Pett, Lackey, & Sullivan, 2003; Thompson, 2004) resulted in the identification of these three interpretable factors (Henry, 2007, 2010). Next, validation procedures to test the psychometric properties of the DDMS-S included content validation (Netemeyer, Bearden, & Sharma., 2003) and two internal consistency estimates of reliability (i.e. split-half coefficient - .9389 and coefficient alpha = .9345), indicating satisfactory reliability (Green & Salkind, 2003).

For qualitative data, a 25-question semi-structured child interview focused on digital technology access and use during and away from school. Included were mobile phone and Internet think alouds (Damico & Baidon, 2007), e.g., “Here is my laptop. Talk aloud as you use it and wherever you go.” Other interview questions were: “How do you feel about the ways you use technologies outside of school?” and “What have been your experiences with technology-related school projects?” An eight-question semi-structured staff interview focused on staff perceptions regarding the children’s technology access and use during school hours and at home, as well as what staff envisioned as important digital skills for the children. A sample question was: “What is your goal for the children’s technology knowledge and skills?”

Qualitative data also included Bussert-Webb’s participant observation and children’s learning logs during the after-school program. Field notes taken during the DDMS-S administration documented children’s questions and basic technology skills in the computer labs. For the electronic logs, youth completed demographic information, summarized what they did during school and in the after-school enrichment program, and wrote reflections on what they enjoyed during the enrichment program.

Procedures

Bussert-Webb was present when the children completed the DDMS-S through Survey Monkey links; the youth completed the DDMS-S, administered in a group setting in their school computer labs after school. We divided the DDMS-S into two parts for administration: 1) technology/Internet access and use inside and outside of school, and 2) Internet searching and critical evaluation of web-based information and a technology self-efficacy scale. We asked youth to complete part two immediately after part one because of program time constraints and limited school computers. Sample questions from part one included: “I use the Internet in the

following places (select all that apply),” and “Who owns the computer that you use most often?” Sample questions from part two were: “How did Oprah Winfrey get started with her talk show? You want to find the answer to this question. What would be the best way to search the Internet for an answer?” and “Canadian Man Raises Enormous 80 Lb., 60-inch Cat. Where would you go to see if this news story is true or false?”

Other DDMS-S items asked each respondent to rate their skill levels in keyboarding, searching the Internet for academic and personal purposes, sending email, and reading information on the Internet. Participants asked Bussert-Webb, bilingual and biliterate, questions in Spanish and/or English when they took the DDMS-S. The children’s questions related to unknown words, such as *search engine* and *Skype*, and how to continue the survey after a certain question set. If a child completed part one of the DDMS-S, s/he immediately went to part two; both parts combined took about 25 minutes on average.

As a nested design, Bussert-Webb interviewed 18 children, two per site, based on high and low digital access as determined by the DDMS-S results. Bussert-Webb interviewed the youth in their language of preference: one elementary child and one middle level child in Spanish, one middle level child in both languages, and 15 children from both levels in English. Bussert-Webb interviewed six children individually and 12 in pairs. Each tape-recorded and transcribed interview took about 30 minutes; the researcher typed interview notes in *Excel* as participants spoke. At the end of each interview, she asked follow-up questions and clarifications and also summarized the responses for member-checking.

Bussert-Webb interviewed the five staff members individually. Each interview lasted approximately 30 minutes. The taped and transcribed interviews took place in site coordinators’ offices or in teachers’ classrooms. The researcher typed notes as the person responded to

questions. For staff member checking, Bussert-Webb emailed each respondent individually an attachment of the interview notes. All staff interviewees reviewed the transcriptions for accuracy, made corrections, or agreed with what was typed.

The optional daily learning logs took the children anywhere from two to 10 minutes, depending on how fast the children typed and how much they chose to disclose. Children completed the logs during the after school enrichment program.

Data Analyses

Qualitative analysis, based on grounded theory, consisted of looking for patterns (Corbin, & Strauss, 2008). We read all data and typed key words, phrases, concepts, or sentences used by respondents. We read the data again, continuing to write participants' words and our insights. We discussed our emerging findings and created themes by looking for similarities and anomalies vis-à-vis our theoretical frameworks (Bogdan & Biklin, 2007). Because we examined all data, an initial theme was the relationship between high-stakes testing and participants' digital practices. However, we decided to focus on findings related to digital access and skills because these themes connected closely to our social justice and cognitive frameworks and our research questions.

We analyzed quantitative data from part one of the DDMS-S using descriptive statistics and frequencies of categorical data, which focused on demographic variables and computer access and use in and out of school. Next, we studied the mean differences in the elementary and middle level students' online reading comprehension from part two of the DDMS-S. This part-two scale consisted of 14 forced-response items, measuring two specific functions of online reading comprehension: locating information and critically evaluating information. Locating information variables focused on both locating information on the Internet as well as locating

information on a specific website. Evaluating information variables focused on evaluating information for accuracy and relevancy.

We scored responses to these 14 forced-choice questions dichotomously (1=correct, 0=incorrect) to calculate a composite score for online reading comprehension ranging from 0 (no correct responses) to 14 (100% correct responses). Once we created the composite and sub-scores for the two main variables, we used a multivariate analysis of variance (MANOVA) to determine if differences existed between elementary level students (n=173) and middle level students (n=98) across the independent variables. Although 310 children participated, some only wrote learning logs and did not complete the DDMS-S.

Results

Our data analyses revealed these themes: technology access during school and for school-related work, technology access away from school, and computer and digital literacy skills.

Technology Access

School-Related Access. According to *Futuro*'s website during data gathering, 23,600 instructional computers were in use, but the district website did not specify if its 50,000 students touched this technology or if the computers were strictly teacher workstations. Thus, when we discuss access, we also mention student use. The district possessed Project Share, consisting of a professional development portal for teachers, a student e-portfolio system in development, and a portal for teachers to communicate and explore content repositories, e.g., www.pbs.org and www.NASA.gov. Although *Futuro* made *Google* and *Yahoo* websites available, it blocked many websites, apparently to protect youth from accessing inappropriate information. During data gathering, *Futuro* prohibited hand-held devices and video game magazines.

All *Futuro* students possessed a www.gaggle.net account, a secure email and Learning Management System (LMS) for K-12 schools. However, based on DDMS-S results, one of the Internet-based activities in which most students (89%) reported the most infrequent use during school was email, which was peculiar. Perhaps pupils had little time to access Gaggle. On the DDMS-S, most elementary and middle level students reported that teachers did not require them to use the Internet. Based on youth learning logs and interviews, students' minimal technology access appeared to be for discrete skill building, high-stakes testing preparation, e.g., Study Island and Accelerated Reader (AR) tests; AR involves reading novels and taking comprehension tests on the computer for assignment grades, points, and prizes.

Elementary and middle level interviewees reported limited computer use during school and for homework, also. This statement by Luis, age 13, was a typical response regarding digital homework: "I don't know. In my whole life? In middle school. Two times. One for a project about a city for Social Studies. And the other one for an English assignment. I had to write an essay." Scratch, an 11-year-old sixth grader, said, "Basically inside of school it's just regular for me ... In technology class I'm basically typing the words." Scratch said his school's technology access was so poor that he decided to get online only at home. Gloria, age 10, who arrived in the United States a year before data gathering, said, "*No usamos la computadora. Tampoco el año pasado. No usamos la computadora durante la escuela*" [We don't use the computer, not even last year. We don't use the computer during school].

According to a middle level technology teacher, about half of the teachers at his school use technology in their classrooms. He described teachers' use of clickers, Smart Boards, and Mobi devices that provide teacher flexibility to interface with interactive whiteboards from anywhere in the room. He did not mention student technology use, however. When asked how

students used technology during the school day, an elementary site coordinator said, “We’re not implementing a lot of [technology] programs because the teachers didn’t grow up with it. I think we need more tech teachers at our campus.”

Besides limited technology access during school, Spanish-dominant Latino/a students in poverty face another access issue: lack of digital Spanish resources. Abby mentioned the language barriers related to technology in her middle school, “*En la escuela no puede ponerlo en español*” [In school I can’t use the computer in Spanish]. When asked how she felt about her inability to use her mother tongue through technology, Abby said, “*Difícil porque a veces no entiendo*” [Difficult because sometimes I don’t understand]. Not allowing this Spanish-dominant student to use Spanish as a scaffold during school represents an injustice.

Out-of-School Access. On the DDMS-S, 74% elementary and 78% middle level students reported having a computer in their home. On average, 24% of student participants had no access to a computer at home. Of those with a computer at home, 13% had no Internet-connected computer. A small percentage of students (7%) reported dial-up Internet service, while 39% had high-speed Internet access. However, 62% of elementary-level students and 48% of middle-level students selected “I Don’t Know” in response to this high-speed Internet question on the DDMS-S. The smaller percentage of middle-level students indicated they were more aware of the type of Internet service available in their homes.

Both sets of surveyed students reported accessing the Internet from home. Other popular places where participants reported using the Internet were: the public library, friends’ homes, relatives’ homes, Internet cafés or community centers, after-school tutorial agencies, fast food restaurants, and the mall. To cross-reference survey results, Bussert-Webb asked interviewees if they had working computers and Internet at home. Abby, age 14, said, “*Computadora - de vez en*

cuando, en la casa. Mi papa no puso el Internet porque el año pasado no trabajó' todo el año" [Computer, sometimes at home. My dad didn't install Internet because he worked intermittently last year]. Abby continued, "*Solamente tengo el iPod y el fon. Lo demás es de mi tía. La computadora es de mi tía. Ella vive cerquita de mi casa. Mi tía tiene Internet"* [I only have an iPod and cell phone. The rest are my aunt's. The computer is my aunt's. She lives close to my house. My aunt has Internet]. Abby's quote demonstrated that she, like other participants interviewed, would find ways to work around limited digital access.

When asked how they felt about slow or nonexistent digital access in their homes, the youth mentioned feeling left out and dissimilar to some peers. Abby said, "Sometimes I feel bad. Like last week *mi papa no tenía trabajo, y no podía pagar por los aparatos electrónicos"* [My dad didn't have work and we couldn't pay for our electronics] "and oh my God, I feel bad." Some may argue subaltern youth may not realize they lag behind in digital access, but Abby's impassioned statement indicated she realized and felt sad about inaccessible technology.

Computer and Digital Literacy Skills

Computer Skills. Participants' limited digital access matched their low-level computer skills. Based on Bussert-Webb's field notes during DDMS-S administration, some students struggled with computer usage. Some created spaces when typing the URL to access the survey, while others did not know how to create lowercase and uppercase letters or how to use a mouse. Bussert-Webb observed many participants pecking slowly at the keyboard with index fingers. These low-level computer skills were particularly noticeable in a rural elementary school with no computer lab time for children during the day. This participant observation allowed us to cross-reference the children's reported technology skills on the DDMS-S.

Digital Literacy Development. Although computer skills are important first steps in acquiring higher-level digital skills, mere computer know-how does not represent digital literacy. The latter includes proficiency in digital searches and inquiry, as well as understanding and evaluating online information. Thus, this next section focuses on finding information online and inquiry, or researching concepts based on one's interests.

Finding Information Online and Inquiry. The MANOVA tested significant for the composite online reading comprehension score, $F(1, 265) = 11.772, p < .001$. The composite score for middle level students ($M = 4.51$; $SD 1.87$) was significantly higher than for elementary level students ($M = 3.72$; $SD = 1.79$). The MANOVA also tested significant for the locating information sub-score, $F(1, 269) = 15.593, p < .001$. The latter score for middle level students ($M = 2.56$; $SD = 1.54$) was significantly higher than for elementary level students ($M = 1.87$; $SD = 1.29$). Table 1 displays the mean scores and standard deviations for the composite score for online reading comprehension and sub-scores for locating and critically evaluating information by school level.

Table 1.

Means and Standard Deviations for Online Reading Comprehension Scores

Measure	Mean	SD
Middle Level Students		
Composite Online Reading Comprehension	4.51	1.87
Locating Information	2.56	1.54
Critically Evaluating Information	1.95	1.10

Elementary Level Students		
Composite Online Reading Comprehension	3.72	1.79
Locating Information	1.87	1.29
Critically Evaluating Information	1.95	1.10

Critical Evaluation of Information. As indicated in Table 1, we found no significant difference on the critically evaluating information variable between the elementary and middle level groups. Importantly, the mean score for items related to critically evaluating information was the same for both groups. This suggests both elementary and middle level students lacked the higher-order thinking skills related to evaluating information for accuracy and bias when critically reading on the Internet.

We triangulated this critical evaluation score with participants' DDMS-S self-reports; 48% of elementary and 29% of middle level students indicated they never check information accuracy. Only 13% of elementary and 11% of middle level respondents stated they always check information for accuracy. Most elementary level students (65%) and about half (53%) of middle level students indicated they never check the authorship of information they read. A few elementary level students (11%) and middle level students (6%) reported always checking authorship of information they read on the Internet at school.

The DDMS-S mean scores and self-reports differ from what an after-school technology teacher at the elementary level reported. She wanted them to research deeply and to discover different points of view. She said she teaches them to read critically online:

If they go on the Internet, when they're working on bios, they find the person grew up in a small town and they go to another website and they find the [same] person grew up in a big town. They learn that they need to continue delving into the information until they find out what are the actual facts.

However, this was just one staff participant at one school. Data from the DDMS-S related to the new literacies of online reading comprehension indicated our youth participants were not developing critical digital literacy skills.

Discussion

We interweave our findings regarding technology access and skill levels with relevant literature and our cognitive constructivism and social justice frameworks, under the overarching theory of New Literacy Studies.

Technology Access

School-related Access. Participants' digital access in school was minimal, which reflects national trends. Schools serving predominantly low SES students possess less instructional technology (National Center for Education Statistics, 2010). Our participants' limited access relates to our cognitive framework as well because students may experience difficulty developing schemata and employing higher-level analytical strategies if they have poor technology experiences in school (Kivunja, 2014). Bussert-Webb noticed students at one rural school struggled with basic computer skills during the DDMS-S administration.

Additionally, the children's limited digital access and skills appeared to mirror some teachers' need for ongoing digital literacy training. A coordinator at the rural school, discussed in the previous paragraph, noted that technology liaisons could build other educators' knowledge and skills and that teachers needed more professional development in technology. This finding is

also supported in the literature. Low-SES teachers and pupils had significantly lower mean scores on an assessment of online reading comprehension (Henry, 2007, 2010), which relates to our social justice framework.

As Henry (2007, 2010) found, children with pauper-like technology and little mentoring tend to have unequal higher-level technology skills, compared to their wealthier peers. Thus, limited school technology access relates to social justice (Warschauer & Ware, 2008). The opportunity gap connected to SES is a systemic inequality (Gorski, 2013). We are not criticizing *Futuro*, which faces much NCLB pressure to help low SES, emergent bilingual children. Student use of digital literacies for authentic purposes is rare in test-preparation environments permeating many low SES schools (Bussert-Webb, 2009; Bussert-Webb & Díaz, 2012; Henry, 2007; Leu, McVerry, et al., 2009).

Furthermore, limited Spanish language access to digital tools in school is a social injustice because Spanish-dominant children cannot build on their learning without language scaffolding. As native-English speakers, we could not imagine being recent immigrants in Japan, for instance, and accessing only Japanese resources at school. Conversely, teaching emergent bilinguals to read in their home language and providing home language resources help their reading achievement in the target language (Chuang, Joshi, & Dixon, 2012; Goldenberg, 2008).

Access, design, diversity, and domination are important facets of social justice (Janks, 2010). However, our interviewees experienced little of Janks' four areas during school or for homework. Autocratic test-preparation curricula controlled and dominated the children, and this teach-to-the-test approach did little to develop their cognitive skills online. They had little in-school technology access, few opportunities to express their diversity, and few design

opportunities through inquiry projects. Thus, youth participants' limited access and mentoring appeared related to the ways they used technology.

Out-of-school Access. Most elementary and middle level students reported having computers in their homes; about one fourth had no home computer. Of participants with at least one home computer, about 13% did not have computers connected to the Internet. Most students indicated using the Internet at home the most, perhaps because of restricted school access. Based on the scant amount of digitally-related homework participants mentioned receiving, it appeared teachers perceived the children to have *no* computer and Internet access. However, to prepare students for cognitive development and employment demands (Kivunja, 2014) and digital equity (Gee, 2011), youth must have challenging, authentic, collaborative digital homework.

Our child participants experienced limited school-based access and use, but higher out-of-school social media use, which relates to national findings. Henry (2010) discovered students in low SES districts used the Internet more outside of school than in school. In Rideout, Foehr, and Roberts (2010), Latino/a and African American youth played video games approximately a 30 minutes more daily than did white youth, and Hispanics had higher computer usage rates than Whites in social networking, instant messaging, video websites, emailing, reading magazines or newspapers, and using graphics and photos. If one of the four social justice areas is absent (access, design, diversity, and domination), children circumvent the system (Janks, 2010). Of four income groups in 2010, the lowest-SES teen mobile phone owners were most likely to use their phones to go online and were least likely to have a computer in their home (Lenhart, Ling, Campbell, & Purcell, 2010). Thus, people can reconstruct and redesign to rhizome around inequalities (Janks).

As social justice scholars, we are also interested in challenging issues of digital inequality

and privilege vis-à-vis ethnicity and other factors. In his later years, Freire embraced complex, multifactor analyses in his struggle for a socially just world (Macedo, 2000). Thus, we conducted data analyses related to children's ethnicity and out-of-school digital access to electronic devices and the Internet, as reported on the DDMS-S. We found no significant differences between these variables. However, we report this finding with caution, since there was not enough ethnic diversity; 87% reported they were Hispanic. The cultural variable may be a factor in future studies with larger percentages of various ethnic groups.

Digital Literacy Skills

Many children participants struggled with basic computer skills. When Bussert-Webb assisted them with the DDMS-S in computer labs, she was shocked some fifth grade students did not know how to type a capital letter. Many youth did not know how to type a URL; for example, some used spaces when they typed the DDMS-S link Bussert-Webb wrote on the whiteboard. Although keyboarding and URL knowledge do not equate to digital literacy, basic computer skills are a precursor to digital literacy skills (Castek, et al., 2015). The first author did not notice differences in basic computer skills and children's ethnicity, gender, or language during the survey administration.

Next, no significant difference existed between the elementary and middle level children on the critically evaluating information variable of the DDMS-S. The mean score for items related to this measure was the same for both groups (e.g., 1.95 out of a possible score of 5.0). This suggests both groups lacked higher-order thinking skills related to evaluating online information for accuracy and bias. The dismal DDMS-S results, especially for middle level participants, indicate the youth need to learn how to create products, develop critical reading

skills online, and write for authentic purposes (e.g., blogs and newsletters). Merely taking AR quizzes and playing electronic games do not help youth to evaluate online information.

Although continuous immersion in stories helps youth to become proficient, engaged readers (Wilhelm, 2008), youth can gain complex cognitive skills when they use digital tools for non-academic purposes (Moje, Overby, Tysvaer, & Morris, 2008), especially when engaging in interest-driven digital literacy experiences (Warschauer & Matuchniak, 2010) and creation versus consumption of information (Attewell & Winston, 2003). In the revised Bloom's taxonomy, creating is at a higher level than evaluating; it requires less of a cognitive load to critique another person's work than to create it (Churches, 2008). Examples of creating in digital environments include programming and creating games and Apps, filming and editing to design new products, producing and directing products, and publishing products (Churches).

Yet, what happens when low SES Latino children receive little challenge to engage in higher cognitive levels? How will this affect their academic and career success? Online reading comprehension relates to identifying questions, and locating, analyzing, synthesizing, and communicating information (Coiro, 2011). Online reading skills predicted seventh grade children's offline (hard copy) reading comprehension, also (Coiro). Furthermore, reading comprehension affects students' achievement in school and college across the curriculum. Thus, poor children's low online reading skills relate to cognitive and social justice outcomes.

As social justice proponents, we pondered whether ethnicity, an independent variable, related to the children's online reading comprehension scores, a dependent variable. Thus, we ran DDMS-S analyses on these variables, but found no significant differences. As previously stated, not enough diversity existed in children's ethnic groups; 87% reported on the DDMS-S

that they were Hispanic. Future research should focus on further fleshing out this variable to determine if a student's cultural background is indeed a factor.

Limitations

Several limitations came to light related to validity, reliability, and repeatability, as well as time constraints and resource limitations. As with any survey instrumentation, self-report data has inherent limitations because researchers find it difficult to verify the results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We should also consider descriptive and interpretive validity in qualitative research in relation to our observational data and field notes (Maxwell 1992; Maxwell & Loomis, 2003). Descriptive validity relates to the factual accuracy of the data that a researcher documents, while interpretive validity focuses on how well a researcher's interpretation relates to participants' perspectives, words, and actions (Maxwell & Loomis). Thus, without full access to the instructional environments for data collection purposes, we relied on students' and teachers' self-report data and our own descriptions and interpretations of the accounts documented in the data.

Additionally, construct validity and reliability limitations existed with the survey implementation. Bussert-Webb noticed some children (less than 10%) took only 10 minutes to finish parts one and two of the DDMS-S; rushing was more common among middle level participants. Taking a survey carelessly by clicking any answer relates to construct validity because it would be difficult to complete both sections in 10 minutes, with an accurate measure of one's dispositions, knowledge, and skills. This relates to reliability also, as participants may have scored better on the knowledge and skills questions if they took the survey at a more leisurely pace. We believe some students rushed because they perceived the DDMS-S to be yet another test, and they may have been tired from *Futuro's* test-preparation focus vis-à-vis NCLB.

Next, we found content validity issues related to DDMS-S inappropriateness for younger and Spanish-dominant participants. Developers normed the DDMS-S with adolescents, with fifth grade being the lowest grade level. However, the youngest population in the present study was third grade. We did notice younger students struggled with some vocabulary, e.g., Skype, Hispanic, and search engine. Thus, the DDMS-S may not have been appropriate for third and fourth graders. Next, the DDMS-S was in English; although survey questions were developed with struggling readers in mind, the Spanish dominant children asked Bussert-Webb questions related to vocabulary. Thus, she sat with Spanish-dominant children to translate. We considered having a Spanish DDMS-S before gathering data, but decided against this because many words were untranslatable, e.g., Skype, google, chat, and Internet. Additionally, in a time of rapidly evolving technologies, our data may be outdated by publication time.

Finally, we experienced time constraints and resource limitations during our research. We had limited access to instructional environments during the school day. District and school administrators would not allow any interruption of the children's instructional time because of test preparation; it was difficult to enter a *Futuro* school to observe technology use firsthand because of this reason. Therefore, we could not validate what staff members and children said and wrote with our own observations during the school day. Since we could only gather data and observe when the after-school program started, we acknowledge these constraints and the limitations related to construct validity and data triangulation, in particular.

Implications

Our participants received little support in complex digital literacies. Some teachers, assuming low-SES, culturally diverse children lack digital access, limit technology-related assignments (Bussert-Webb, 2014). However, educators can ask youth first. If youth lack access,

campuses could provide time and devices for generative, inquiry-based digital assignments. We hope our article begins to change misperceptions about nondominant children's digital literacy access.

Indeed, we can teach youth with diverse abilities to use digital tools in sophisticated ways. Teaching youth to create, evaluate, locate, and summarize online information critically should be a curricular facet at all schools to improve their critical thinking and reading skills (Leu, O'Byrne, et al., 2009). For example, after Aboriginal Canadian high school students engaged in digital storytelling, their print literacy skills improved from two to five grade levels and their writing moved from a word and sentential level to paragraphs and long essays (Pirbhai-Illich, 2010). Similarly, elementary students, mostly Latino/as, engaged in critical digital literacy inquiry to explore domination regarding grueling work in strawberry field; technology facilitated their cognitive processes and collaboration (Warschauer & Ware, 2008).

Teachers and district personnel could determine the tools children enjoy using, and should ask *how* and *whether* youth's "online literacies should be embraced in the regular curriculum" (Alvermann, 2008, p. 18). By listening to youth, in and out-of-school digital practices could complement each other (Leu, O'Byrne, et al., 2009). We wish to merge home and school digital access, skills, and practices to help diverse youth develop new literacies (O'Brien & Scharber, 2008).

As more schools move to technology-infused and mobile learning environments, e.g., one device per student (1-to-1) and bring-your-own-device (BYOD) models, educators need the requisite skills to teach digital literacy and new literacies to diverse learners. Burns-Sardone (2008) made a compelling case for BYOD. Teacher preparation programs can prepare new teachers to leverage their personal devices for learning purposes. In schools with limited

computers and tablets, students and teachers can access other devices, e.g., cell phones and iPads, to engage in collaborative academic activities. However, educators require more training to help learners with less digital literacy experiences to be successful within these technology-infused learning environments. This is especially important for closing the digital divide along SES and other lines. If we move beyond a focus on digital access (a primary digital divide) and use (a secondary digital divide), we may reduce a tertiary-level digital divide, which relates to digital skills and online reading comprehension. To avoid this tertiary divide, we can include differences in technology use and online reading and research, while developing digital literacy practices and skills for all learners (Henry, 2010).

The new literacies of online reading and comprehension are essential to learner expression and development – cognitively and critically. Yet federal funding and legislation must change so teachers possess the training and time to incorporate generative, challenging digital projects with youth. We know of no state-level assessment that tests online reading and writing in the USA. Moreover, the National Assessment of Educational Progress (NAEP) framework excludes online reading (Leu, McVerry, et al., 2009). Literacy funding, legislation, assessments, and frameworks affect teacher preparation, professional development, and classroom teaching, and can move education into the 21st Century (O'Brien & Scharber, 2008).

Limited technology integration appears the norm in urban schools serving mostly nondominant, low-SES students. Much of this void relates to test preparation and NCLB (Henry, 2007; U.S. Department of Education, 2002). It is easier to implement new literacies without testing pressures and with middle-SES pupils who dominate the language of instruction. For example, Rish and Caton (2009) engaged students in collaborative, generative digital projects. However, Swords and Spaceships, the fantasy and science fiction English course Caton taught,

had no graduation requirements or state-mandated assessment pressure. Furthermore, Rish's and Caton's rural schools served mostly white middle-class native-English students.

Last, the digital divide relates to tools, access, dispositions, ever-changing skills, and new literacies practices (Leu et al., 2007). This divide expands inequalities related to ethnicity, language, race, and SES (Henry, 2010). We can and should do more to help nondominant children's technology access and critical digital literacy and online reading comprehension skills. Our findings propel us to action.

References

- Alvermann, D. E. (2008). Why bother theorizing adolescents' online literacies for classroom practice and research? *Journal of Adolescent & Adult Literacy*, 52(1), 8-19. Retrieved from http://www.readinghalloffame.org/sites/default/files/Why_Bother_Theorizing_Adolescents_Online_Literacies_for_Classroom_Practice_and_Research.pdf
- Attewell, P., & Winston, H. (2003). Children of the digital divide. In P. Attewell & N.M. Seel (Eds.), *Disadvantaged teens and computer technologies* (pp. 117-136). Münster, Germany: Waxmann.
- Barton, D., & Hamilton, M. (1998). *Local literacies: Reading and writing in one community*. London: Routledge.
- Bogdan, R. C., & Biklin, S. K. (2007). *Qualitative research for education: An introduction to theory and methods* (5th ed.). Boston: Allyn & Bacon.
- Brown, A., & Patten, E. (2014). *Statistical portrait of Hispanics in the United States, 2012*. Washington, DC: Pew Research Center. Retrieved from <http://www.pewhispanic.org/2014/04/29/statistical-portrait-of-hispanics-in-the-united-states-2012/#educational-attainment-by-race-and-ethnicity-2012>
- Burns-Sardone, N. (2014). Making the case for BYOD instruction in teacher education. *Issues in Informing Science and Information Technology*, 11, 191-201. Retrieved from http://iisit.org/Vol11/IISITv11p191-201Sardone0505.pdf?utm_content=buffer48e02&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer
- Bussert-Webb, K. (2009). ¿Qué hago? Latino/a children describe their activities in an “exemplary” school. *Journal of Latinos and Education*, 8, 38-54.
<http://dx.doi.org/10.1080/15348430802466753>

- Bussert-Webb, K. (2014). Problems and possibilities: Emergent bilinguals and multimodalities. *The Tapestry Journal: An International Multidisciplinary Journal on English Language Learner Education*, 6(1), 35-44.
- Bussert-Webb, K., & Díaz, M. E. (2012). New literacy opportunities and practices of Latino/a children of poverty in and out of school. *Language and Literacy*, 14(1), 1-25. Retrieved from <http://ejournals.library.ualberta.ca/index.php/langandlit/issue/current>
- Castek, J., Coiro, J., Henry, L. A., Leu, D. J., & Hartman, D. K. (2015). Research on instruction and assessment in the new literacies of online reading research and comprehension. In S. Parris, and K. Headley (Eds.), *Comprehension instruction: Research-based best practices*, (3rd Edition), (pp. 324-344). New York: Guilford Press.
- Children's Defense Fund. (2011). *Child poverty in America*. Washington, DC: Author. Retrieved from <http://www.childrensdefense.org/library/data/2011-child-poverty-in-america.pdf>
- Chuang, H. K., Joshi, R. M., & Dixon, L. Q. (2012). Cross-language transfer of reading ability. *Journal of Literacy Research*, 44(1), 97-119. doi: 10.1177/1086296X11431157
- Churches, A. (2008). Bloom's taxonomy blooms digitally. *Tech & Learning*, 1. Retrieved from <http://www.techlearning.com/news/0002/bloom39s-taxonomy-blooms-digitally/65603>
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.
- Coiro, J. (2011). Predicting reading comprehension on the Internet contributions of offline reading skills, online reading skills, and prior knowledge. *Journal of Literacy Research*, 43(4), 352-392. doi: 10.1177/1086296X11421979
- Damico, J. S., & Baildon, M. C. (2007). Examining the ways readers engage with Web sites

during think aloud sessions. *Journal of Adolescent & Adult Literacy*, 51(3), 254-263.

Retrieved from <https://resources.oncourse.iu.edu/access/content/user/mikuleck/>

[Filemanager_Public_Files/L750%20Electronic%20Lang%20and%20Lit/More%20New%20Forms/Damico%20CWR.pdf](https://resources.oncourse.iu.edu/access/content/user/mikuleck/Filemanager_Public_Files/L750%20Electronic%20Lang%20and%20Lit/More%20New%20Forms/Damico%20CWR.pdf)

Freire, P. (1970). *Pedagogy of the oppressed*. Harmondsworth, England: Penguin.

Fry, R., & López, M. H. (2012). *Hispanic student enrollments reach new highs in 2011*.

Washington, DC: Pew Research Center. Retrieved from <http://www.pewhispanic.org/2012/08/20/hispanic-student-enrollments-reach-new-highs-in-2011/>

Gándara, P., & Contreras, F. (2010). *The Latino education crisis: The consequences of failed social policies*. Cambridge, MA: Harvard University Press.

Gee, J. P. (2000). The New Literacy Studies: From “socially situated” to the work of the social.

In D. Barton, M. Hamilton, & R. Ivanic (Eds.), *Situated literacies: Reading and writing in context* (pp. 180-196). London, UK: Routledge.

Gee, J. P. (2007). *What video games have to teach us about learning and literacy* (2nd ed.). New York: Palgrave.

Gee, J. P. (2011, April). *On spatial grounds: Critical geography and education research for social justice: Presidential session*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Goldenberg, C. (2008). Teaching English language learner: What the research does and does not say. *Pacific Educator*, (ESED 5234), 8-44. Retrieved from

<http://digitalcommons.georgiasouthern.edu/cgi/viewcontent.cgi?article=1026&context=esed5234-master>

- González, A. (2016). The contemporary US digital divide: From initial access to technology maintenance. *Information, Communication & Society, 19*(2), 234-248.
<http://dx.doi.org/10.1080/1369118X.2015.1050438>
- Gorski, P. C. (2013). *Reaching and teaching students in poverty: Strategies for erasing the opportunity gap*. New York: Teachers College Press.
- Green, S. B. & Salkind, N. J., 2003. *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.
- Henry, L. A. (2006). SEARCHing for an answer: The critical role of new literacies while reading on the Internet. *The Reading Teacher, 59*, 614-627. Retrieved from
<http://istc651.pbworks.com/f/SEARCH+model,+Henry,+AN20430354.pdf>
- Henry, L. A. (2007). *Exploring new literacies pedagogy and online reading comprehension among middle school students and teachers: Issues of social equity or social exclusion?* (Unpublished doctoral dissertation). University of Connecticut, Storrs, CT.
- Henry, L. A. (2010). Unpacking social inequalities: Lack of technology integration may impede the development of multiliteracies among middle school students in the United States. In D. L. Pullen, M. Baguley, & C. Gitasaki (Eds.), *Technoliteracy, discourse and social practice: Frameworks and applications in the digital age* (pp. 55-79). Hershey, PA: IGI Global.
- Janks, H. (2010). *Literacy and power*. New York: Routledge.
- Kalantzis, M. (2011, April). *The New London agenda in retrospect. Presidential session: Beyond New London: Literacy learning and the design of social futures*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

- Karchmer, R. A., Mallette, M. H., Kara-Soteriou, J., & Leu, D. J., Jr. (Eds.). (2005). *Innovative approaches to literacy education: Using the Internet to support new literacies*. Newark, DE: International Reading Association.
- Kivunja, C. (2014). Do you want your students to be job-ready with 21st century skills? Change pedagogies: a pedagogical paradigm shift from Vygotskyian social constructivism to critical thinking, problem solving and Siemens' digital connectivism. *International Journal of Higher Education*, 3(3). Retrieved from [file:///C:/Users/Try/Downloads/5156-17195-1-PB%20\(2\).pdf](file:///C:/Users/Try/Downloads/5156-17195-1-PB%20(2).pdf)
- Lankshear, C., & Knobel, M. (2006). *New literacies: Everyday practices and classroom learning* (2nd ed.). New York: Open University Press.
- Lenhart, A., Ling, R., Campbell, S., Purcell, K. (2010). *Teens and mobile phones*. Washington, DC: Pew Research Center. Retrieved from <http://pewinternet.org/Reports/2010/Teens-and-Mobile-Phones/Chapter-2/Part-4.aspx>
- Leu, D. J., Jr., Kinzer, C. K., Coiro, J., Cammack, D. (2004). Toward a theory of new literacies emerging from the Internet and other information and communication technologies. In R. B. Ruddell & N. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed.), (pp. 1568-1611). Newark, DE: International Reading Association.
- Leu, D. J., Kinzer, C. K., Coiro, J., Castek, J., & Henry, L. A. (2013). New literacies: A dual level theory of the changing nature of literacy, instruction, and assessment. In D. Alvermann and N. Unrau (Eds.), *Theoretical models and processes of reading*, (6th ed.), (pp. 1150-1181). Newark, DE: International Reading Association.
- Leu, D. J., McVerry, J. G., O'Byrne, W. I., Zawilinski, L., Castek, J., & Hartman, D. K. (2009). The new literacies of online reading comprehension and the irony of No Child Left

- Behind: Students who require our assistance the most, actually receive it the least. In L. M. Morrow, R. Rueda, & D. Lapp (Eds.), *Handbook of research on literacy instruction: Issues of diversity, policy, and equity* (pp. 173-194). New York: Guilford Publications.
- Leu, D. J., O'Byrne, W. I., Zawilinski, L., McVerry, J. G., & Everett-Cacopardo, H. (2009). Comments on Greenhow, Robelia, and Hughes: Expanding the new literacies conversation. *Educational Researcher*, 38(4), 264-269. Retrieved from <http://literacyachievementgap.pbworks.com/f/264.pdf>
- Leu, D. J., Zawilinski, L., Castek, J., Banerjee, M., Housand, B., Liu, Y., & O'Neil, M. (2007). What is new about the new literacies of online reading comprehension? In L. Rush, J. Eakle & A. Berger (Eds.), *Secondary school literacy: What research reveals for classroom practices* (pp. 37-68). Urbana, IL: National Council of Teachers of English.
- López, M. H., González-Barrera, A., & Krogstad, J. M. (2014). *Latino support for Democrats falls, but Democratic advantage remains*. Washington, DC: Pew Research Center. Retrieved from <http://www.pewhispanic.org/2014/10/29/chapter-4-top-issues-in-this-years-election-for-hispanic-voters/>
- López, M. H., González-Barrera, A., & Patten, E. (2013). *Closing the digital divide: Latinos and technology adoption*. Washington, DC: Pew Research Center. Retrieved from <http://www.pewhispanic.org/2013/03/07/closing-the-digital-divide-latinos-and-technology-adoption/>
- Luke, A. (2005). Foreword. In Pahl, K. & Rowsell, J. (Eds.), *Literacy and education: Understanding the new literacy studies in the classroom* (pp. x-xiii). London: Paul Chapman.

- Macedo, D. (2000). Introduction to the anniversary edition. In P. Freire. *Pedagogy of the oppressed: 30th anniversary edition* (3rd ed.), (pp. 11-27). New York: Continuum.
- Maxwell, J. (1992). Understanding and validity in qualitative research. *Harvard Educational Review*, 62(3), 279-301. Retrieved from <http://www.msuedtechsandbox.com/hybridphd/wp-content/uploads/2010/06/maxwell92.pdf>
- Maxwell, J. A., & Loomis, D. M. (2003). Mixed methods design: An alternative approach. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (pp. 241-271). Thousand Oaks, CA: Sage Publications.
- Moje, E. B., Overby, M., Tysvaer, N., & Morris, K. (2008). The complex world of adolescent literacy: Myths, motivations, and mysteries. *Harvard Educational Review*, 78(1), 107-154. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2743424/>
- Morrell, E. (2008). Six summers of YPAR. In J. Cammarota & M. Fine (Eds.), *Revolutionizing education: Youth participatory action research in motion* (pp. 155-184). New York: Routledge.
- Morrell, E. (2015). *Critical literacy and urban youth: Pedagogies of access, dissent, and liberation*. New York: Routledge.
- National Center for Education Statistics. (2010). *Teachers' use of educational technology in U.S. public schools: 2009*. Washington, DC: U.S. Department of Education. Retrieved from <https://nces.ed.gov/pubs2010/2010040.pdf>
- Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*. Thousand Oaks, CA: Sage Publications.
- O'Brien, D., & Scharber, C. (2008). Digital literacies go to schools: Potholes and possibilities. *Journal of Adolescent & Adult Literacy*, 52(1), 66-68. Retrieved from

[file:///C:/Users/Try/Downloads/Digital-literacy-goes-to-School-article%20\(1\).pdf](file:///C:/Users/Try/Downloads/Digital-literacy-goes-to-School-article%20(1).pdf)

Partnership for 21st Century Learning. (2007). *Framework for 21st century learning*.

Washington, DC: Author. Retrieved from <http://www.p21.org/about-us/p21-framework>

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method

biases in behavioral research: A critical review of the literature and recommended

remedies. *Journal of Applied Psychology*, 88(5), 879-903. Retrieved from

https://www.researchgate.net/profile/Scott_Mackenzie8/publication/9075176_Common_method_biases_in_behavioral_research_a_critical_review_of_the_literature_and_recommended_remedies/links/54ca6d620cf22f98631afcaa.pdf

Pett, M. A., Lackey, N. R., & Sullivan, J. J. (2003). *Making sense of factor analysis: The use of factor analysis for instrument development in health care research*. Thousand Oaks, CA: Sage Publications.

Pirbhai-Illich, F. (2010). Aboriginal students engaging and struggling with critical

multiliteracies. *Journal of Adolescent & Adult Literacy*, 54(4), 257–266. Retrieved from

http://www.jenjenson.com/courses/5860_winter14/wp-content/uploads/2014/01/canadaMultiliteracies.pdf

Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). *Generation M²: Media in the lives of 8- to*

18-year olds. Menlo Park, CA: Henry J. Kaiser Family Foundation. Retrieved from

<http://www.kff.org/entmedia/upload/8010.pdf>

Rish, R., & Caton, J. (2009, November/December). Complexities of teaching new literacies in our classrooms. *Adolescent Literacy in Practice*, 9-13. Retrieved from

http://kennesaw.academia.edu/RyanRish/Papers/226891/Complexities_of_Teaching_New_Literacies_in_Our_Classrooms

- Skudowitz, J. (2009). *Research report: A case study of the digital literacy practices in a grade 10 English classroom at a private school*. (Unpublished Master Thesis). University of the Witwatersrand, Johannesburg, South Africa. Retrieved from <http://wiredspace.wits.ac.za/bitstream/handle/10539/5938/9807639HMAResearchReport2008.pdf?sequence=1>
- Stepler, R., & Brown, A. (2015). *Statistical portrait of Hispanics in the United States, 1980–2013*. Washington, DC: Pew Research Center. Retrieved from <http://www.pewhispanic.org/2015/05/12/statistical-portrait-of-hispanics-in-the-united-states-2013-key-charts/>
- Stolle, E. P. (2008). Teachers, literacy, and technology: Tensions, complexities, conceptualizations, and practice. In Y. Kim, V. J. Risko, D. L. Compton, D. K. Dickinson, M. K. Hundley, R. T. Jiménez, et al. (Eds.), *57th Yearbook of the National Reading Conference* (pp. 56-69). Oak Creek, WI: National Reading Conference.
- Street, B. V. (1993). Introduction: The New Literacy Studies. In B. Street (Ed.), *Cross-cultural approaches to literacy* (pp. 1-21). Cambridge, UK: Cambridge University Press.
- Street, B. V. (2003). What's new in new literacy studies? *Current Issues in Comparative Education*, 5(2), 1-14. Retrieved from http://www.tc.columbia.edu/cice/pdf/25734_5_2_Street.pdf
- Texas Education Agency. (2015). *2015 Accountability manual for Texas public school districts and campuses*. Austin, TX: Author. Retrieved from <https://rptsvr1.tea.texas.gov/perfreport/account/2015/manual/manual.pdf>
- Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington, DC: American Psychological Association.

- U.S. Census Bureau (2010). *Income, poverty, and health insurance coverage in the United States: 2009*. (Report P60, n. 238). Retrieved from <http://www.census.gov/prod/2010pubs/p60-238.pdf>
- U.S. Census Bureau. (2015). *Projections of the size and composition of the U.S. population: 2014 to 2060*. Washington, DC: Author. Retrieved from <https://www.census.gov/content/dam/Census/library/publications/2015/demo/p25-1143.pdf>
- U.S. Department of Education (2002). *Public Law 107-110, 107th Congress. No Child Left Behind Act of 2001*. Washington, DC: Author. Retrieved from <http://www2.ed.gov/policy/elsec/leg/esea02/107-110.pdf>
- Warschauer, M. & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education*, 34(1), 179-225. Retrieved from http://www.education.uci.edu/Department%20of%20Education/Department%20of%20Education_oldweb2007-1024/gse_web_site_prod/person/warschauer_m/docs/equity.pdf
- Warschauer, M., & Ware, P. (2008). Learning, change, and power. In J. Coiro, M. Knobel, C. Lankshear, & D. J. Leu, (Eds.), *Handbook of research on new literacies* (pp. 215-239). New York: Lawrence Erlbaum Associates.
- Watkins, S. C. (2011). Digital divide: Navigating the digital edge. *International Journal of Learning and Media*, 3(2), 1-12. Retrieved from http://rcgd.isr.umich.edu/seminars/Fall2014/articles/Watkins_2012.pdf
- Wilhelm, J.D. (2008). *You gotta be the book: Teaching engaged and reflective reading with adolescents* (2nd ed.). New York: Teachers College Press.

Thinking about Professional Literacies with Mathematics, English Language Arts, and Science Preservice Teachers

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Abstract

The intent of this article is to present our initial conceptualizations and thinking about the literacies preservice teachers acquire and learn during their teacher preparation program. Beginning with some general and global definitions of literacy, we then present our thinking about these literacies in a school context, a teacher practice context, and then in a teacher preparation context. The article closes with a design for an upcoming study of preservice teachers' acquisition of these literacies. The proposed study explores 'professional literacies' with primary/junior and intermediate/senior preservice teachers of Mathematics, English Language Arts, and Science during teacher preparation curriculum courses.

Le but de cet article est de présenter nos conceptualisations initiales et la réflexion sur l'alphabétisation preservice enseignants à acquérir et apprennent au cours de leur programme de préparation des enseignants. À commencer par quelques définitions générales et globales d'alphabétisation, nous présentons ensuite notre réflexion sur ces alphabétisations dans un contexte scolaire, un contexte de pratique de l'enseignant, puis dans un contexte de préparation des enseignants. L'article se termine avec un design pour une prochaine étude de l'acquisition de ces alphabétisations de. L'étude proposée explore alphabétisations professionnelles avec les futurs enseignants primaires / junior et intermédiaire / supérieurs de mathématiques, l'anglais, et de la science au cours des cours du programme d'études de préparation des enseignants.

Key words: *professional literacies, preservice teacher, teacher preparation, elementary and secondary school, mathematics, English language arts, science*

"... in the world of the future, the new illiterate will be the person who has not learned how to learn." Alvin Toffler, US writer.

Background

In 1958, UNESCO defined literacy as the ability to read and write short simple statements, and they contextualized (or reduced) it to one's everyday life. Over the years, UNESCO has modified its definition, identifying the earlier version as 'basic literacy', and developing a more comprehensive definition called 'functional literacy'. In 1978,

"A person is functionally literate who can engage in all those activities in which literacy is required for effective functioning of his or her group and community and also for enabling him or her to continue to use reading, writing, and calculation for his or her own and the community's development" (UNESCO, 2005b, p. 154).

And in 2005,

"Literacy is the ability to identify, understand, interpret, create, communicate and compute using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve his or her goals, develop his or her knowledge and potential, and participate fully in community and wider society"

Many other organizations echoed this point of view, for example the Organisation for Economic Co-operation and Development (OECD) in 1997 and the International Council for Adult Education (ICAE) in 2003 noted basic literacy was generally understood as "learning to read and write (text and numbers), reading and writing to learn, and developing these skills and using them effectively for meeting basic needs" (ICAE, 2003). The American Library Association (ALA) made a similar statement in 2005 stating literacy as "the ability to use printed

and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential" (ALA, 2015). The Canadian Council on Learning (2007) defined functional literacy as including "the ability to analyse things, understand general ideas or terms, use symbols in complex ways, apply theories, and perform other necessary life skills — including the ability to engage in the social and economic life of the community." Of value to note, from all these definitions is the increasing sense of literacy for a bigger purpose than just to be able to read and write.

Literacy is being acknowledged and accepted as a necessary aspect to one's learning, to one's ability to gather and develop knowledge, and realizing one's intellectual as well as social, economic, and political potential. From literacy to language, and back to literacy, one then needs language to convey one's learning to another, and to capitalize on one's social, economic, political, and intellectual potential. Language, being the use of signs, gestures, words, sounds, and patterns to convey meaning within particular contexts such as cultural, social, and political (Lankshear, 1997), requires a much more sophisticated sense of reading and writing. Language then, using symbols in complex ways and applying theories through speaking, writing, and thinking implies a level of literacy greater than the strict ability to read and write.

The intent of this article is to present our initial conceptualizations and thinking about the literacies preservice teachers acquire and learn during their teacher preparation program. Beginning with some general and global definitions of literacy, above, we then present our thinking about these literacies in a school context, a teacher practice context, and then in a teacher preparation context. The article closes with a design for an upcoming study of preservice teachers' acquisition of these literacies.

Literacy in the school context

Bruce (1997) stated that any definition of literacy is subject to change based on societal needs at any given time. There is little debate that the literacies students need to learn in school today are evolving, for example often due to the influence of Information and Communication Technology (ICT). It can be argued, therefore, that the literacies that teachers need must also necessarily change. While any major change can be seen as daunting, situated within an appropriate context these new challenges can also be seen as exciting and natural. Generally, we find that technology and ICT is often a driving force behind societal change, and thus change in teaching and learning. Hence, we use a technology and ICT lens initially to explore the changing nature of literacy in the school context.

In 1996, The New London Group, a group of English language arts researchers, wrote a manifesto on multiliteracies that called for the teaching of new literacy skills related to technology and to the corresponding societal changes. This group argued that multiliteracies will dramatically impact forms and functions of writing by focusing on the importance of being literate in a variety of modes. The group recognized that as a global economy and, therefore community, we are increasingly expected to interact with people from a vast array of cultures on a daily basis. New literacy skills are required to understand accents, to read body language, and to communicate effectively with people from various cultures and with varying dialects. In addition, the manifesto acknowledged the monumental change taking place in society due to the increased use of ICT. The group argued for the need for new literacy skills related to the use of new technology.

Kress (2003) argued for the teaching of new literacy skills such as design. In contrast to simply word processing a final draft of their narratives, Kress believed that students should be taught to design multimodal narratives that reflect the increased use of image and sound that they

are seeing on the Internet. Today's students are visually inundated when they read online. Hence, these types of multimodal texts involve new modes of literacy that complement the conventional skills students are currently learning in schools. Kress also stated that unless students begin to learn these new skills, they are heading toward illiteracy.

The multimodal texts as text, images, video, and other media forms add the potential for authors and readers to shape their interpretation by exploring various stated and unstated social, cultural, and historical contexts. The internet is providing a reading and writing space where multimodal texts are the expected and normal experience. This is the hypertextuality of expression through the internet. Hypertextuality is "an open-ended and ever developing" (Riffaterre, 1994, p. 786) literacy experience where, possibly at its simplest, "writing and reading become pictorial operations" (Sandbothe, 2000, p. 90), and at its most complex, a non-linear sense of text. For example, to use a connect-the-dot metaphor, a framework of dots intended to create one particular image by the author(s) that may become a different image by the reader(s) as they connects the dots to suggest a different perspective and interpretation. Hypertextuality (Riffaterre, 1994; Sandbothe, 2000) is requiring that students blend knowledge and ideas from a variety of types of information to produce highly literate, multimodal pieces of information.

In this way, new student-generated texts are always evolving as students become more efficient with the process of design. Burnett and Myers (2006) noted that screen-based texts can be easily altered and manipulated and this ease of revision may prompt writers to experiment with text more extensively. Students can begin to make critical decisions about the interplay between text and image and they can continue to enhance their texts as their own digital and visual literacy skills become increasingly sophisticated. Jewitt (2003) and Fuchs (2006) argued that new literacy practices and the use of new Information and Communication Technology

(ICT) within the classroom are producing new types of texts. These new texts signal the need to re-think conceptions of literacy, learning, and assessment.

Digital literacy is a term that is emerging in policy documents as an attempt to bring the societal trend of increased use of ICT and the development of new literacies into the classroom. Knobel and Lankshear (2009) talked about digital literacy as being a response to the fears of a growing digital divide between those that can participate in learning and those that cannot. Lanham (1993) claimed that digital literacy expands the definition of literacy from its original definition of “to read and write” to now meaning “the ability to understand information however presented”. He argued that the multimediated nature of digital information means that deciphering information involves “being skilled at deciphering complex images and sounds as well as the syntactical subtleties of words” (p. 200). Following this argument, asking students to create digital texts using text, hyperlinks, and images is a logical step in their learning of these important literacy skills. A digitally literate person is “quick on their feet in moving from one kind of medium to another...know[s] what kinds of expression fit what kinds of knowledge and become skilled at presenting [their] information in the medium that [their] audience will find easiest to understand” (p. 200).

While digital literacy is beginning to make an appearance within policy documents, Leu and Kinzer (2000) refer to this time as “literacy as technological deixis” (p. 117). The term *deixis*, they explain, is used by linguists like Murphy (1986) for words such as *now*, *today*, *here*, and *there*. These are all words that change quickly depending on the time and space in which they are being said. This can be said for literacy as it relates to technology as the forms and functions of literacy rapidly change and adapt to the evolution and creation of new technologies. Looking more broadly, the same can also be said for the evolving role of the classroom teacher

in response to these significant changes in the literacy practices actually being used in today's society and economy.

Literacy in the context of teacher practice

Pilgrim and Bledsoe (2011) argued that there has never been greater access to information for teachers than there is today. Because there is so much information available for practicing teachers, the forms and functions of Professional Development (PD) have changed. Teachers may now engage in meaningful, timely PD that is relevant and useful to them in their particular classrooms at any time. As a result, learning to teach is less about absorbing particular bits of information and more about acquiring specific literacies (such as understanding where and how to access all of this useful information, and being able to self-determine the kinds of PD one might need at any given time) that will endure this evolution in teaching and learning.

Literacy behaviours impact on one's identity (Gee, 1997). Rather than simply being involved in the practice of reading or writing text, participants are shaping their identities in relation to the discourses within which they are participating. Socially constructed hypertexts, for example, require a certain amount of specific knowledge about terminology and spatial organization. Hypertext "is actually understood as a technology of connection and as a transformative aesthetic form of expression" (Burnett & Marshall, 2003, p. 81). Hypertext is the text of the internet that allows for immediate interconnectivity with any and all other texts, images, and media forms. Often, hypertext is created by more than one writer, and read by more than one reader—a distinctly social and collaborative literacy experience. Someone who is a novice to this type of writing will be identified by his/her lack of specific knowledge about the language and organization of the text. Therefore, veteran teachers who are accustomed to being authorities within the classroom will identify themselves as novices when it comes to the

teaching of new literacies. While this flattening of the teacher-as-expert hierarchy is a characteristic of new literacies, it is certainly not a characteristic of most traditional and current classroom settings. When teachers begin to learn, and, ultimately teach, these new literacies, they are not only being asked to learn new skills, for example, related to ICT, but more importantly they are also being asked to change their roles within the classroom and their thinking.

Jewitt (2003) stated that the nature of the product that students create changes due to the increased use of modes (i.e., sound, image, text, links, etc.), and that teachers need to re-conceptualize three critical components of their classroom: literacy, learning, and assessment. Assessment practices must change in order to adequately capture students' multimodal competence. Failure to change assessment practices, Jewitt believed, is to ignore the meaning of the process and the final product.

Teachers' professional literacies are intertwined, for example, assessment literacy is integrally linked to subject area literacy. Adams and Hamm (2000) discuss practical methods for making such literacies relevant to the mathematics classroom. Kalantzis, Cope, and Harvey (2003) argued that four types of assessment practices will become increasingly relevant to multimodal English language arts classrooms -- project assessment, performance assessment, group assessment, and portfolio assessment. Project assessment, which is designed to measure broad knowledgeability and flexible solutions orientation to knowledge, requires students to complete in-depth tasks (e.g., task plan, retrieval of information, and presentation). Performance assessment would assess organization and problem solving skills that occur in the planning, doing, and completion of an assigned task. Group assessment would measure the collaborative skills of students and the collective work of a learning group. Portfolio assessment becomes

particularly important because it acknowledges the embodied nature of the students' learning, and that, within the multimodal context, learning outcomes will vary greatly among students. All four of these assessment approaches call for significant changes not only in classroom assignments, but also in teacher and student thinking, and hence the use and understanding of the literacies that underlie this thinking.

Lankshear and Knobel (2011) talked about new literacies and Kress's ideas about design could be considered as presenting a new literacy. Lankshear and Knobel do not believe that all new literacies must relate directly to the use of new technology. However, they argue that there are new technical considerations when discussing new literacies (for example, software programs, keyboarding etc.), and there is a new ethos to consider (for example, seeing the world as changing in fundamental ways and needing to change our literacy practices to stay current).

One example of literacy that is not technology dependent, but as Lankshear and Knobel (2011) argue, relevant and necessary to learn in this new society and economy is scenario planning. Scenario planning involves reading succinct narratives that outline a possible situation in the future. These scenarios are designed to help people think about possible future outcomes before undertaking specific actions. By delving deep into one particular situation and predicting possible outcomes, one takes on various roles within that scenario (such as perhaps corporate executive, curriculum planner or policy maker, and teacher). Taking on these various roles and participating in the discourses of these roles builds literacy and supports the type of thinking strategies that people need in the workforce of this new economy. So, while scenario planning may lack the technical considerations of a new literacy, it encompasses the ethos considerations. New literacies can emerge that will not involve the use of a computer.

Thinking of teaching and learning, and potential curricula used for those purposes, to researchers such as Grumet (1992) curriculum means more than simply the listing of and the delivery of content. Instead, curriculum can be said to be the fluid, daily lived experience of school. It is always unique and is constantly in flux. As students and teachers continually define and revise their thoughts and ideas with one another, and share individual perspectives, Pinar (2004) argued that this lived experience of school is a “complicated conversation” in which one is often asked to think and respond with ideas outside of the prescribed body of information found in a curriculum document. Within the context of such a complicated conversation, students and teachers learn, through conversation, a deeper understanding of a discipline. A conversation is not won or lost and there is no conversion to or from but rather, there are perspectives shared and ideas expanded (Pinar, 2004). This kind of “think-on-your-feet” teaching requires preservice teachers to learn new kinds of skills that they can apply across any discipline given particular situations (Selmer & Graham, 2010). Selmer and Graham (2010) talk of critical and evaluative skills teachers need with professional literature, which they also need with their classroom practice—for example in developing a classroom community. These are reflection-in-action (Schon, 1983) skills and they are practical as well as reflective; teachers will rely on their critical thinking skills and evaluative skills of the professional literature as teachers respond to students in the milieu of the classroom context and teachers’ classroom practice.

Literacy in the teacher preparation context

Teacher education researchers must begin to critically examine the kinds of skills and the type of knowledge most beneficial to our new preservice teachers entering into classroom contexts reflective of the vast and ongoing societal changes mentioned above. For example, Bissaker, Davies and Heath (2011) report on a partnership between the South Australian

Department of Education and Flinders University in Adelaide, Australia which led to the building of a purpose-designed school to provide state-of-the-art learning for Science and Mathematics. In order to make this school happen, they acknowledged the need to teach preservice teachers the skills to match this kind of learning environment. They focused on teaching preservice teachers how to teach group inquiry and how to manage students engaged in meaningful self-directed learning. In the end, one of the critical elements to the success of the school was the need to teach the preservice teachers because the ways of teaching and the kinds of literacies these teachers needed to promote the kind of learning desired in a state-of-the-art school were unique compared to the regular teacher education programs typically offered.

There are many discourses preservice teachers are exposed to in a short amount of time as they begin a teacher preparation program. Discourses from subject areas, assessment and evaluation, leadership, safe school and mental health, learning disabilities, technology in education, and pedagogy are a few, and not an exhaustive list of examples. To participate in a discourse may require a certain level of literacy in that discourse. For example, when considering the use of technology in classroom practice, media literacy is an inherent element of participating in the teacher preparation classroom discourse. The context of teacher preparation programs and curriculum course-work in Ontario also assumes another literacy, that of the Ontario College of Teachers' (OCT) ethical standards and standards of practice in an effort to promote the professionalism of classroom teaching.

Literacies such as media literacy have a distinct sense in a school classroom context with school students. This literacy will be a shared literacy with students, however, at the teaching level rather than the learner level the literacy may take a different form as teachers' discourse includes pedagogical knowledge and interpretations of media in classroom practice. Joyce

(1995) used the term “cardinal technology” to explain the iterative relationship that hypertext technology can create with a learner: the nature of the technology changes that in turn causes a change in the nature of the learning that takes place. Therefore, as teachers begin to learn new technologies and incorporate new literacy and assessment practices into their classroom teaching, the nature of their thinking and teaching begins to change. It is critical that as teachers introduce digital literacy skills into their classrooms research needs to be done on how their thinking changes, when it begins to change and why.

We take the perspective that in teacher professional preparation programs there is a relatively short length of time in which preservice teachers are exposed to the discourse related to professional practice. To be a participant in this discourse requires a complex interplay of subsets of knowledge related to professional practice. Various literacies from subject content, assessment and evaluation, leadership, safe school and mental health, learning disabilities, technology in education, and pedagogy, to name a few, provide support for, and a foundation to the teacher discourse.

We are identifying these various literacies required of teachers in their professional practice as ‘professional literacies.’ Ultimately, the more literacies of which a learner has knowledge and facility, the more efficacious one may feel he/she has employing the teacher discourse.

A design of a study of preservice teachers’ acquisition of professional literacies

Teacher education researchers must begin to notice and critically examine the literacies most closely related to the kinds of knowledge and the types of skills most beneficial to preservice teachers. We propose that teacher discourse and the supporting professional literacies play an essential role in informing preservice teachers’ classroom practice so that they teach

differently from the ways they were taught. To better understand the nature of the professional literacies our preservice teachers were learning in our curriculum courses towards the development of their teacher discourse, we are embarking on a study of elementary and secondary school level preservice teachers of mathematics, English language arts, and science.

Two questions guide this study,

1. What curricular program elements facilitated the development of preservice teachers' professional literacies?
2. What sense of personal change do preservice teachers' feel they have experienced over the duration of a teacher preparation program?
 - a. What particular or combinations of professional literacies are evident in preservice teachers' discourse?
 - b. What is the nature of the literacies that emerge in preservice teachers' classroom practice?

We are taking a phenomenological stance to this exploration of preservice teachers' acquisition of professional literacies. Not only are we interested to better understand the preservice teachers' acquisition of professional literacies, we were looking for a deeper understanding of the interplay between the preservice teachers' learning of professional literacies and our teaching strategies. As three instructors in a teacher preparation program from three different subject areas, we appreciated the similarities in our thinking about preservice teachers' need for professional literacies as they develop their teacher discourse, and, we were intrigued by the inherent subjectivity of our teaching and learning approaches because of our subject area differences. Instructor journals and course materials were considered a valuable component to the body of data for this study.

We have designed four phases to this study. Phase one consists of identifying the course design, goals of the courses as defined by the instructors, and initial conceptions instructors carry for the intended outcomes of the courses. This data exists as course outlines and instructors' journal notes of their intended goals and outcomes for their courses. Phase two involves instructors maintaining a journal of their thinking and observations throughout the duration of the curriculum courses. In particular, the instructors will note,

- a. Thoughts of professional literacies
- b. A log of professional literacies brought to the learners' attention
- c. Observations of professional literacies during class lessons
- d. Reflections of course/program features that facilitated the development of professional literacies.

Phase three occurs concurrently with phase two and consists of questionnaires inquiring into preservice teachers' knowledge and understanding of professional literacies, and where they perceive they learned these literacies. These questionnaires will be managed by a research assistant and occur on September 1st, January 1st, and April 1st. Phase four is a focus group with a subset of preservice teachers discussing what they have learned about professional literacies, how their perspective of teaching and learning has changed because of a focus on professional literacies, and exploring their awareness of the impact of professional literacies as they respond to a classroom scenario case study.

The analysis of data will consist of three phases, i., coding for emergent themes (Corbin & Strauss, 2015) from the questionnaires and focus group data, ii., coding for common and different themes in instructors' journal notes, and iii., a comparison between part i., and part ii.,

results to make inferences that identify potential influences to the changes in preservice teachers' thinking.

Next Steps

The results of this study will be used by the instructors to better understand the professional literacies that contribute to one's teacher discourse. There may be tensions in our thinking about a sense of basic literacy, functional literacy, and the incredibly contextual space of the classroom teaching experience for these professional literacies. One question we have concerns the nature of knowledge of the vocabulary of the professional literacies, and the application of the professional literacies in one's teacher discourse. For example, do preservice teachers get past a 'buzz words' stage in their language use, how much are they aware of the impact of their language on their ability to communicate their pedagogical intentions to various audiences such as students, parents, or administrators. Additionally, and personally, we expect what we learn will also factor into our thinking about our course curriculum and course design. The implementation of the results and the subsequent course improvements will become planning and development of our future curriculum courses.

References

- Adams, D. & Hamm, M. (2000). *Media and literacy: Learning in an Electronic age—issues, ideas, and teaching strategies* (2nd ed.). Springfield, IL: Charles C. Thomas.
- (ALA) American Library Association. (2015). retrieved from
<http://www.ala.org/groups/committees/ala/ala-literacy>, May 23, 2015.
- Bissaker, K., Davies, J. & Heath, J. (2011). The way up, down under. *Journal of Staff Development*, 32(2), 32-6.
- Burnett, C., Dickinson, P., Myers, J., & Merchant, G. (2006). Digital connections: Transforming literacy in the primary school. *Cambridge Journal of Education*, 36(1), 11-29.
- Burnett, R., & Marshall, P. D. (2003). *Web theory: An introduction*. London: Routledge.
- Bruce, B. (1997). Current issues and future directions. In J. Flood, S. Heath, & D. Lapp (Eds.), *Handbook of research on teaching literacy through the communicative and visual arts* (pp. 875-884). New York, NY: Simon & Schuster Macmillan.
- Canadian Council on Learning. (2007). State of Learning in Canada: No Time for Complacency, Ottawa, January 2007, p. 86. Available at:
http://www.literacy.ca/content/uploads/2012/02/NewSOLR_Report.pdf
- Carrington, V., & Luke, A. (1997). Literacy and Bourdieu's sociological theory: A reframing. *Language and Education*, 11(2), 96-112.
- Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). Thousand Oaks, CA: Sage.
- Fuchs, C. (2006). Exploring German preservice teachers' electronic and professional literacy skills. *ReCALL*, 18, 174-192.

- Gee, J. (1997). Foreword: A discourse approach to language and literacy. In C. Lankshear (Ed.), *Changing literacies* (pp. xiii-xix). Buckingham, England: Open University Press.
- Grumet, M. (1992). The language in the middle: Bridging the liberal arts and teacher education. *Liberal Education*, 78(3), 2-6.
- (ICAE) International Council for Adult Education. (2003). Agenda for the Future: Six Years Later, a presentation to CONFINTEA+6, a United Nations Educational, Scientific and Cultural Organization (UNESCO) conference on adult education and literacy held in Bangkok Thailand, Sept. 8–11, 2003.
- Jewitt, C. (2003). Re-thinking assessment: Multimodality, literacy and computer-mediated learning. *Assessment in Education*, 10(1), 83-102.
- Joyce, M. (1995). *Of two minds: Hypertext pedagogy and poetics*. Ann Arbor, MI: The University of Michigan Press.
- Kalantzis, M., Cope, B., & Harvey, A. (2003). Assessing multiliteracies and the new basics. *Assessment in Education*, 10(1), 15-26.
- Kress, G. (2003). *Literacy in the new media age*. London, UK: Routledge.
- Knobel, M., & Lankshear, C. (2009). Wikis, digital literacies, and professional growth. *Journal of Adolescent & Adult Literacy*, 52(7), 31-634. Kress, G. (2003). *Literacy in the new media age*. London, UK: Routledge.
- Lankshear, C. (1997). *Changing literacies*. Buckingham, UK: Open University Press.
- Lankshear, C., & Knobel, M. (2011). *New literacies: Everyday practices and social learning*. New York, NY: Open University Press.

- Leu, D., & Kinzer, C. (2000). The convergence of literacy instruction with networked technologies for information and communication. *Reading Research Quarterly*, 35, 108-127.
- Murphy, S. (1986). Children's comprehension of deictic categories in oral and written language. *Reading Research Quarterly*, 21, 118-131.
- New London Group (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66(1), 60-92.
- (OECD) Organisation for Economic Co-operation and Development and Statistics Canada. (1997). Literacy Skills for the Knowledge Society: Further Results of the International Adult Literacy Survey, Ottawa and Paris, p. 14.
- Patton, M. Q. (2011). *Developmental evaluation: Applying complexity concepts to enhance innovation and use*. New York, NY.: The Guilford Press.
- Pilgrim, J., & Bledsoe, C. (2011). Engaging preservice teachers in learning through social networking. *Journal of Literacy and Technology*, 12(1), 2-25.
- Pinar, W.F. (2004). Possibly being so: Curriculum as complicated conversation. In Pinar (Ed.), *What is curriculum theory* (pp. 185-204). Mahwah, NJ: Lawrence Erlbaum Associates.
- Posavac, E. J., & Carey, R. G. (2003). *Program evaluation: Methods and case studies*. (6th ed.). Upper Saddle River, New Jersey: Prentice Hall.
- Riffaterre, M. (1994). Intertextuality vs. hypertextuality. *New Literary History*, 25(4), 779-788.
- Sandbothe, M. (2000). Interactivity - hypertextuality - transversality: A media-philosophical analysis of the internet. *Hermes: International Journal of Language and Communication Studies*, 24, 81-108.

Schon, D. (1983). *The reflective practitioner: How professionals think in action*. USE: Basic Books Inc.

Selmer, S., & Graham, M. (2010). Developing preservice teachers' professional identities and establishing collaborative understandings about teacher education. *The International Journal of Learning*, 17(3), 189-200.

UNESCO. (2005). Aspects of Literacy Assessment: Topics and issues from the UNESCO Expert Meeting, 10-12 June, 2003, retrieved from <http://www.unescobkk.org/education/literacy-and-lifelong-learning/literacy/>, May 23, 2015.

UNESCO. (2005b). Education for All Global Monitoring Report 2006. Published by UNESCO. Paris, France. Retrieved from http://www.unesco.org/education/GMR2006/full/chapt6_eng.pdf, May 23, 2015.

Co-constructing Place, Space, and Race: African American and Latinx Participants and Researchers' Representations of Digital Literacy Research in the South

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Abstract

In this paper, we examine the processes, struggles, and interactions that shape the co-construction of digital literacy programs and research for African American and Latinx parents and children in the South. The guiding questions of this piece are: (1) What do African American and Latinx¹ participants' counter-stories tell us about place-space and raced literacies? and (2) How do we, as digital literacy researchers, negotiate and co-construct counter narratives in institutional spaces? We draw on analytic reflexivity tools (Anderson, 2006) to describe how our positionalities as researchers/practitioners of color collaborate with multiple stake-holders in the design and implementation of community and school-based digital media projects for African American and Latinx parents and students. Within these contested spaces are distinct binaries of social, political, historical, and cultural literacies that resound in our digital literacy research in communities where we (the researcher-practitioners) are often positioned as cultural insiders.

Keywords: *place and space literacies, African Americans, Latino/a Americans, digital literacies, race, culture, New Literacy Studies, multimodalities*

Introduction

In this space we call digital literacies lies multiple texts, meaning-making, and social practices that lend themselves to the ways children and adults learn in today's societies. Young children, adolescents, and adults engage in practices and technologies such as digital storytelling (Hall & Damico, 2007; Hull & Katz, 2006; Lewis Ellison, 2016, 2017; Lewis Ellison, & Wang, under review; Noguérón-Liu, & Jordan, in press); Solomon, 2012; Vasudevan, 2006), remixing (Gainer & Lapp, 2010; Knobel & Lankshear, 2008), multiplayer online games (Gee, 2008; Lewis Ellison, Evans, with Pike, 2016), videos, texting (Drouin, 2011; Drouin & Davis, 2009; Lewis, 2013; Reardon, 2008), blogs (Beach, Anson, Breuch, & Swiss, 2009; Lewis, 2014), and social networking sites (Watkins, 2009) to keep up with today's ways of learning, creating, talking, constructing meaning, and experiencing life. These individuals develop (digital) participatory cultures (Dooley, Lewis Ellison, & Welch, 2016; Jenkins, Clinton, Purushtoma, Robison, & Weigel, 2009) to engage with other readers, writers, thinkers, and storytellers to form alliances and networks (Lewis Ellison, 2014; Lewis Ellison, & Wang, 2016; Lewis Ellison, Evans, with Pike, 2016) that shed light on who they want to be in these spaces, how they choose to interact with peers, and where they want their contributions to matter (Ito et al., 2013; Jenkins et al., 2009). In these spaces, they are Do-it-yourself (DIY) learners who are initiators; they take control over their learning and utilize opportunities in meaningful ways (Parker, 2010). Yet, these spaces and places are shaped by issues of race, power, social class, and gender, and that reflect the unique dimensions of the ways in which digital literacy research is studied, conceived, and perceived in the South.

We live in a climate where cries of race-specific injustices, inequities, oppression, and past and present crimes prevail among children, adolescents, and adults of African American and

Latinx descent. We wrestle with the heavy-laden discourses, political measures, reforms, and interpretations that attempt to bind the ways in which members of these groups learn, understand, and live in this digitally-mediated society. While conducting research in African American and Latinx communities, we notice that young children, adolescents, and adults have rich digital literacy practices, and are knowledgeable participators within the digital cultures that they create; nevertheless, they face vocal and visible markers in how race, space, and place are situated in their everyday lives in the South (Lewis, 2011, 2014). As authors, we understand that race is a vital component to sociohistorical and sociocultural lenses that cannot be separated from “the bound compartments of time to which it is forever tied” (Kirkland, 2013, p. 117). The historical accounts in the South relating to racism, stereotypes, and oppression have left an indelible mark on how we, as researchers, tell our participants’ stories, and on who we are as digital literacy researchers.

Our work has drawn us to places where stories dwell and where conceptions about participants’ lives and practices are organic but meaningful. As qualitative researchers who share cultural, racial, or ethnic backgrounds with the communities we study, we are simultaneously positioned as both “outsiders” and “insiders”. We are afforded the opportunity to tell these visceral stories that derive from the racist, and oppressive realities of some individuals. And, when we think about spaces and places, we honor and reflect on the community and program spaces we co-construct with our participants, wherein we have been privileged to listen to their sensitive stories, in efforts to discuss, problematize and re-imagine the marginalized positions through our collaborative research. Thus, place, space, and race are paramount in our research areas because of the ways in which our work is influenced by broader issues of movement of youth and adults in literacy and digital media spaces within Georgia and Texas. Our discussion

of modern life in the deep south and rural regions help us understand how access and place are played out in digital literacies. We identified in our individual and collective journeys that this work has not been discussed in the ways we have experienced it personally and academically.

In this article, we share accounts from northern and southern cities in the state of Georgia (Atlanta and a small city in the north of the state) and Austin, Texas, and discuss our understanding of the roles of place, space, and race in our work in these respective locations. The heart of Atlanta, Georgia, displays beacons of history, community, diversity, and education. Each year, approximately forty-two hundred African American individuals migrate from Cobb, Fulton, DeKalb, and Gwinnett counties to Atlanta, (Hess, Henrici & Williams, 2011; Hobson, 2009). Furthermore, recent transnational migration patterns have shaped the meaning of diversity and race relations, with both urban and rural areas of Georgia experiencing a rapid demographic shift (Lippard & Gallagher, 2011).

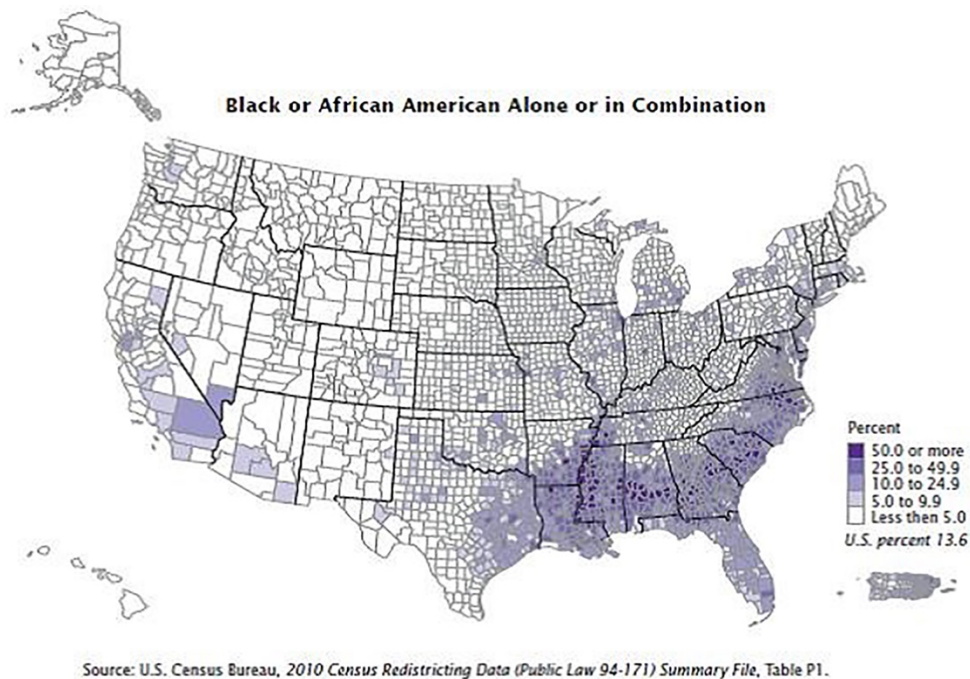


Figure 1. Black or African American Population as a Percent of County Population (2010)

Georgia's population of Latinx residents has also increased greatly over the past 20 years. This growth is due to increased job opportunities in textile, food processing, and construction industries, as well as an oversaturation of job markets in traditional destination settings (Lippard & Gallagher, 2011). Between 1990 and 2000 (Pew Hispanic Center, 2005) and from 2010 to 2011 (Passell, Cohn, & Lopez, 2011), seven states in the Southern region saw some of the highest percentages of changes in Latinx population growth: North Carolina, Arkansas, Georgia, Tennessee, South Carolina, Alabama, and Kentucky. These shifting demographics disrupt and change the dynamics of Black/White relations, as is evident in challenges faced by activist organizations trying to involve new immigrants in their social-justice oriented groups (Smith, 2006). The state of Georgia, where two of the projects featured in this paper were conducted, was one of the ten top states with a fastest growing Latinx population from 2000-2011 (Pew Hispanic Center, 2013), with a 103% rate of growth. The rapid Latinization of the region points to the need to document how Latinx residents in new migration destinations make sense of their positions, identities, and connections to their homeland and new communities.

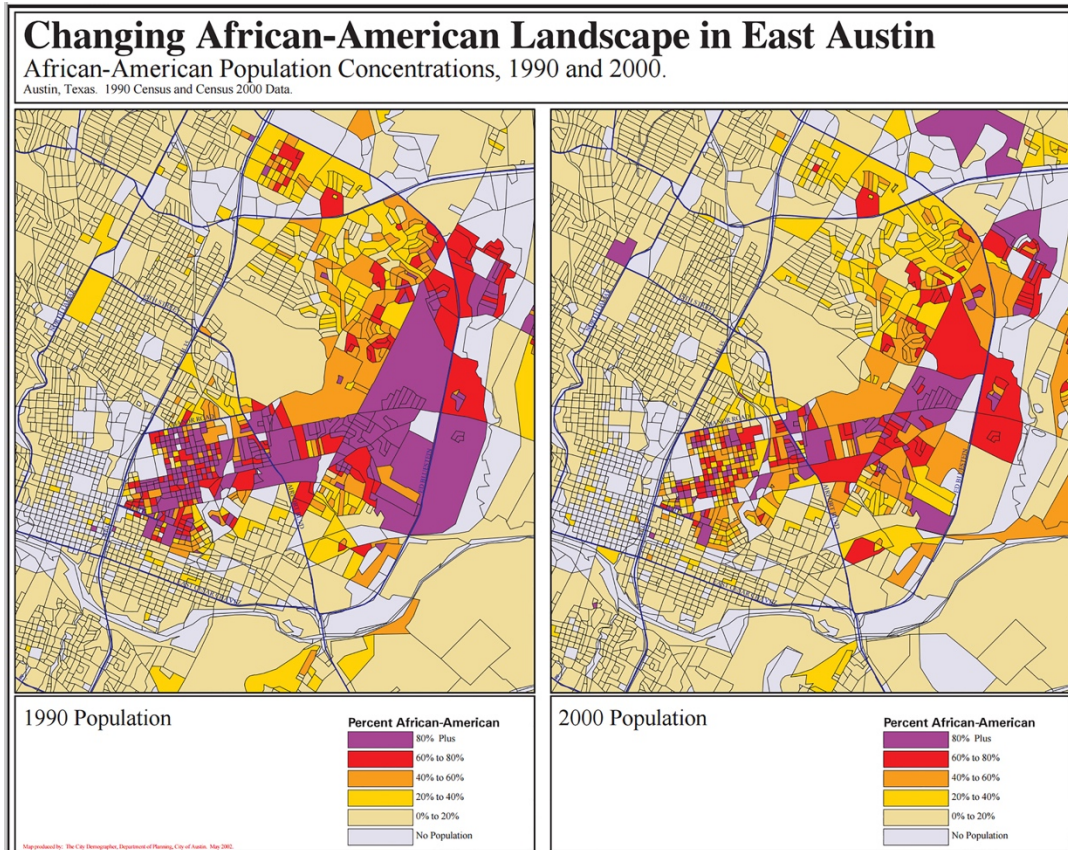


Figure 2. Changing African American Landscape in East Austin (1990-2000)

Similarly, Austin (Austin, Texas), is a growing city in population and national prominence, particularly in the areas of everything cutting edge: music, movies, technology, and education. At the same time, it is a city that struggles to keep its liberal, free-spirited roots as its gentrification increases (Bertrand, 2015), and as less-affluent and marginalized populations are forced to the city's perimeter.

In this article, we frame our concern and attention with the prevalent identity, race, and equity issues that are often hidden and disguised in these various regions to influence where, how, and why we conduct digital literacy research in the South. By focusing on our participatory and action research methods, the complexities of our positionality, and our personal and reflective vignettes, we explore how we negotiate our lives and selves as African American and

Latinx researchers. We argue that a counter-storytelling (Bell, 1980; Solórzano & Yosso, 2002; Urrieta, & Villenas, 2013) lens from African American/Latinxs' perspectives can shed new light into our understanding of the affordances of digital literacies in the construction and power of space and place. While we acknowledge that these same issues may also be dominant in other areas and ethnicities in the United States, for the purposes of this article, we focus on the roles of place, space, and race in three digital literacy projects concerning African American and Latinx parents and children that were conducted in the hearts of Georgia and Texas. We then share our constructive sentiments as digital literacy researchers of color who conduct research along with our participants in these southern states. The following research questions guide our inquiry:

1. What do African American and Latinx participants' counter-stories tell us about place-space and raced literacies? and
2. How do we, as digital literacy researchers, negotiate, and co-construct counter-stories in institutional spaces?

Theoretical Framing

Place-Space Literacies

Human learning is heavily influenced by social environments (Vygotsky, 1978). As a result, we understand that individuals' environments are important to the learning places and spaces in which we participate; however, we also need to address *whose* places and spaces are represented. Miller (2014) reminds us that "spaces/places as spatialized are not fixed or static: they shape and orient people's values, thoughts, behaviors, beliefs, and identities, while people also shape spaces/places and ascribe meaning to them" (p. 124). Hence, we adopt a perspective where we aim to better understand participants' practices, beliefs and emic understandings of the communities and neighborhoods where they live, play, create, and learn.

As such, space is a “practiced place” (de Certeau, 1984), but *place* and *space* are quite different. According to de Certeau, “the street geometrically defined by urban planning is [a place] transformed into space by walkers” (p. 117), or rather, the “act of reading is the space produced by the practice of a particular place: a written text, i.e., a place constituted by a system of signs” (p. 117). Place is “an order of distributed relationships, location, and fixity, such as a given culture to be transmitted, an interpretation to be learned, or defined skills and methods of reasoning to be acquired,” while space is “emergent, incomplete, and unpredictable” (Talbut, 2000, p. 19). Additionally, “places exist in and of themselves, but spaces are places brought to life” (Blackburn & Clark, 2014, p. 94). By adopting a space-as-practiced-place approach, we seek to illuminate the agency of communities of color in the reshaping and transformation of social spaces.

Our work in place-spaced literacies in digital literacy research builds on previous research extended in the South through participation and collaboration with literacy scholars across digital spaces. The **Southern Places – Digital Spaces Collaborative** (<https://soplacesdigspaces.wordpress.com/>), founded by scholars, from southeast areas, is an example of previous work across southern regions and rural areas in the U.S. to understand the social and digital spaces that form their work as a communicative practice (Leander & Sheehy, 2004; Leander, Phillips, & Taylor, 2010; Mills & Comber, 2013). While they found that these social, digital, and geographical spaces are represented in the literature around urban spaces (Soja, 2010; Vasudean, 2006), they point to the critical need for recognizing this work in the South in order to expand the conversation beyond urban areas. Thus, there is a great need to represent the digital based projects that comprise our work.

Counter-Storytelling and Digital Resources

In our research, we illustrate how community-based and school-based programs become spaces for youth and adults to re-imagine and revise deficit perspectives about their identities as well as the places/spaces where they live and learn. We pay special attention to the affordances of digital tools for individuals who are regarded as “at-risk” based on their affiliations with neighborhoods or cities, or their nation-state origins (Hull, Zacher, & Hibbert, 2009). Drawing on foundational tenets of Critical Race Theory (Solórzano & Yosso, 2002), we explore how community-based programs, relationships, and the digitally-mediated sharing of lived experiences can help participants craft counter-stories and challenge deficit ideologies about people of color. Like Vasudevan (2006), we consider digital and multimodal resources as having great potential for students and research participants to tell and construct different stories in different ways.

We also explored how participatory methods allow us to build coalitions and reach out to minority youth and families in the South (Harman & Vargas-Dubai, 2012), creating opportunities for storytelling and composition where counter-stories emerge. In the different programs described in this article, our projects share a participatory paradigm aligned with the functions of counter-storytelling (Solórzano & Yosso, 2001), which include: (a) building community among traditionally/historically marginalized communities; (b) creating contexts to transform established ideologies; (c) creating possibilities for individuals to recognize others facing similar challenges; and (d) collaborating with others in the combination of stories and individuals’ current realities and issues. As a method and pedagogical tool, counter-storytelling with digital tools allows us to explore in depth the connections between identity, marginalization, and affiliation in relation to place.

We examine these processes in the texts and stories shared by participants in digital composition projects we lead. However, as designers and facilitators of workshops, programs, and projects, we find ourselves invested in advocacy for communities where we belong. By writing and presenting research findings that challenge deficit perspectives about technology expertise, our scholarship positions us as brokers between institutions and our communities (Villenas, 1996). Hence, we theorize our collective reflection as counter-stories as well, voicing the challenges, obstacles, and processes of conducting participatory research with individuals who share cultural, linguistic, or racial backgrounds with us.

Beyond the Digital Divide: Digital Literacy as Culturally and Socially Constructed

We explore digital literacies through the lens of New Literacy Studies (Barton & Hamilton, 2000; Barton, Hamilton, & Ivanič, 2000; New London Group, 1996; Street, 1995) and multimodalities (Kress & van Leeuwen, 2001), highlighting the great potential of critical and participatory methods in the examination of classroom practices that may benefit families and ethnic minority youth in the South (Morrell, 2005). However, we argue that common assumptions in technology-based interventions may require further interrogation and self-reflection of our roles as researchers and practitioners, and of our cultural, linguistic, gender, and racial identities. These include: (a) deficit perspectives about digital access and participation of culturally diverse communities without critical analysis of digital divide ideologies (Warschauer & Matuchniak, 2010); (b) assumptions about generational digital expertise vis-à-vis adults who are not digital ‘natives’; (e.g., Prensky, 2001); and (c) assumptions about the neutrality of tools, interfaces, and applications which may have been designed in terms of class, race, gender, language competence, or educational background with a particular user in mind (Warschauer, 2003). Through our established relationships with participants in the field, our use of

ethnographic methods, and our attention to participants' emic perspectives on their use of technology, we seek to illuminate the culturally situated nature of digital literacies in relation to place/space.

Drawing from our theoretical orientations to literacy and digital literacy as culturally and socially situated entities (Street, 1995), we share the ways in which we designed and implemented our studies, and our tensions and struggles as researchers, teachers, "tech-savvy" instructors, and "cultural insiders" with strong commitments to advocacy for students with whom we shared cultural and linguistic backgrounds. However, we illustrate how we balanced these roles with our roles as outsiders to their life circumstances, and how we addressed the power-relation differential in the research process, one that was influenced by our affiliations with schools/universities (Villenas, 1996). We situate the goals of our work in unpacking digital divide assumptions, and our stances on the ethical use of visual methods (through digital and visual media created by us, our students, or a collaboration thereof) as visual meanings, understandings, and interpretations that may operate differently in particular groups and communities (Pink, 2007). We draw on analytic reflexivity tools (Anderson, 2006) to describe how our positionalities as researchers/practitioners of color collaborate with multiple stakeholders in the design and implementation of community and school-based digital media projects for African American and Latinx parents and students.

Methodology: Reflexivity as Researchers

Based on our shared interests in digital literacies, multimodalities, race, and cultured spaces among African American and Latinx American families, young children, and adolescents, we began our collaboration six years ago. We initially met as participants in a national mentoring program for scholars of color, and later presented at a literacy conference focusing on digital

literacy research. While our work captures the essence of digital literacy practices in our respective states, we also share our own culturally and linguistically diverse subjectivities in relation to digital media and digital literacy practices, as well as the ways in which we situate our work both in and out of the field. On one occasion, we examined the overlapping challenges of our work in a symposium centered on research methods, where we compared data instances of fieldwork, race, and space. We highlighted the epistemologies that informed our research and equally questioned what we called our *methodological epistemologies* or the ethos of approaches and practices that researchers (self) identify to acquire knowledge in research. We noticed that, as residents of Georgia and Texas, we have experienced in different ways the impact of place, space, and race on our work. We interviewed and audio-recorded ourselves to capture organic stories of our subjectivities and positionalities, have met on many occasions via conference calls, Skype, and at conferences to discuss the roles of space, place, and race in our work. We ultimately created Google documents to share our thoughts, store our work, and eventually collaborate for this article.

Tisha, an African American, brings several years of experience in exploring how the intersections of agency, identity, and power are situated among African American families and adolescents' digital literacy and multimodal practices. *Silvia* is a bilingual, first-generation immigrant, whose research focuses on the access of new technologies for Latinx immigrant communities in the United States. Marva is an African American with more than 18 years of experience teaching English Language Learners, and hones her skills in examining the use of digital tools for identity-building among African American first graders. All researchers are assistant professors at major universities.

Co-constructing Contexts

Our data illustrates three separate qualitative and exploratory research studies that shape our co-constructions of place, space, and race literacies in digital media programs in urban and rural areas of Georgia and Texas. The data excerpts featured in this article were identified as instances of “tensions” where our own understandings of space and digital literacy practices were challenged or reshaped by our engagement in fieldwork with participants. Study 1 examined data from a larger qualitative research study project, *Dig-A-Fam: Families’ Digital Storytelling Project*² of five African American mothers and their children’s digital storytelling practices in an urban community college lab and church in Georgia. In this article, one mother, Chant’s counter-stories grew from her and her son’s, Rem, involvement in creating a digital story together. They participated in two digital storytelling workshops with Tisha for a total of three hours in a computer lab, and brainstormed and engaged in story boarding activities in preparation for their stories. Chant and Rem also completed a video of their discussions and how they negotiated multimodal modes for the digital story in their home. Data sources included: pre- and post- semi-structured and un-structured interviews, audio- and video-taped participant observations, field notes, digital photos, digital workshops, and the completed digital story created between April and September 2014 (Lewis Ellison, 2016; 2017; Lewis Ellison & Wang, under review). In this article, Tisha shared Chant’s narratives that extended from creating the digital story but also how digital media access and internet inaccessibilities and inequalities collide within her urban spaces.

Study 2 examines the ways in which, with the aid of digital tools, Latinx immigrant adults who participated in the *Family Literacy - Clase de Computación Project*³ made sense of the location of their current neighborhood (a small mobile home community in Georgia), and of their places of origin in southern Mexico. Such interactions occurred in two related family

literacy programs implemented during the academic years of 2012-2014 at an elementary school and a community-based library. Nine focal participants were individually interviewed. A total of 49 sessions were implemented in Year 1, and 22 sessions in Year 2. All were conducted by Silvia and a graduate assistant. Sessions were facilitated in Spanish and audio recorded, with reflective field notes and logs of digital documents kept by the researchers. For the purpose of this paper, Silvia focuses on interactions between Latinx parents at the elementary school site, where they searched for images and maps of their current neighborhoods, and used images to represent and explore their places of origin.

Study 3 was an exploratory project investigating the role digital tools could play in the writing processes of 12 African American first graders. The *Make Me a Story Project* took place over a spring semester during a center-time pull-out program in the school's computer lab. The first graders met two-to-three times a week for approximately 30 minutes, at which time they planned and completely composed their stories using digital storytelling software that differentiated their process from traditional writing. There were also sessions where they met to share their creations on a large screen for a computer author's chair (Labbo, 2004) experience. Marva acted as tech support and facilitator when the students asked for help with the technology. Data collected included audio and video recordings of writing and sharing sessions, transcripts of their digital stories, samples of pre-study first grade writing assignments, and interview surveys from parents and teachers. The children were also interviewed before, during, and after the project took place. While the study focused on their interactions with digital tools and how those tools might influence their texts, the present paper explores the unexpected issues that emerged during the implementation of the study.

Findings

In the following sections, we demonstrate how place, space, and race are co-constructed among African American and Latinx parents, youth, and adults in the South, and we explore the tensions that arose as we conducted digital literacy research.

Study 1

Tisha – “We Don’t Do That in Your Community”

Participants’ Counter-stories. Before researching digital literacy practices among African American families in the South, Tisha studied a family living in an urban community in the Northeast section of the United States. Digital literacy practices and narratives revealed how an African American mother and her 10-year-old son composed stories about living in an urban neighborhood. However, what could have been a story that spelled despair became one of empowerment; what was most intriguing was that the mother’s intricate psycho-social identity afforded unique digital literacy practices between her and her son—ones that told a different story about survival, agency, and power (Lewis, 2011, 2013, 2014). Findings from this study led Tisha to create the *Dig-A-Fam: Families’ Digital Storytelling Project* to teach families how to create digital stories from personal interest stories in their home/school communities (Lewis Ellison, 2016; Lewis Ellison & Wang, under review). This project invited African American mothers whose agentive stances galvanized them to learn to create digital stories with their family members. For this article, however, Tisha focused solely on Chant and Rem and Chant’s narratives about access and inequalities with the digital.

Place played a major role in the work with Chant. Chant, a 36-year-old college professor and single parent, and her 9-year-old son Rem were participants in the *Dig-A-Fam: Families’ Digital Storytelling Project* in 2014. As avid digital literacy users and creators, Chant and Rem met with Tisha at an urban community, college computer lab to create a digital story together.

Their digital story, “Our Travels”, highlighted their car travels from the southeastern to mid-western areas of the United States. Their pictures and stories told of their navigation through a variety of states—from serene areas to ones where Confederate flags were openly displayed. Chant and Rem demonstrated how a mother and son could not only work together to digitally compose a story from inception to completion, but how digital tools in the home became a viable literacy practice.

While Chant’s income classified her as middle-class, she admitted that she and Rem have always lived in urban neighborhoods since her move to Georgia in 2010, and she currently lives in a neighborhood where most of her neighbors are of African American descent. At times, she is stereotyped by this choice to remain in her community. She stated, “I’m not afraid to be near my people.” And yet, while she pledged solidarity to her community, she was victim of car and home burglary, and occasionally witnessed inconsistencies with the upkeep of portions of the neighborhood. A major disturbance arose when she attempted to provide more efficient technological access for herself and Rem, a disturbance that demonstrated both race- and place-based oppression.

My Internet is fairly fast. However, I do live in a part of town where sometimes issues do arise—maybe the dynamics of the community lends itself to sometimes not getting equal access to certain resources. Sometimes the Internet may not work effectively as it would if I lived in Buckhead or Brookhaven. I was looking at switching my Internet provider and service from Comcast to Direct TV for financial reasons. It would have been more financially feasible and beneficial if I made some changes, so I called Direct TV and said, ‘I have Direct TV and I also have a Comcast phone, Internet, and television; however, I

[want to] bundle it together.’ They informed me, ‘No we don’t do that in your community.’

Chant shared that she was upset about being forced to keep her current Internet service because of her neighborhood. She also shared more of her phone conversation with the Internet customer representative:

‘That’s very interesting,’ I said, ‘You don’t do that in *my* community?’ And she [the customer representative] said, ‘What’s your zip code?’ I told her and she said, ‘No.’ I said, ‘What about zip code 30309?’ (a zip code from another county) She said, ‘Oh yes we do this service there.’ So, it is safe to say that certain technologies are not available in my community. I could get AT&T Internet, but those two systems can’t merge with Comcast for some reason just because of my zip code, where it would be cheaper and much more beneficial if I were to have access to those services. We don’t have access so we have to pay the premium rates for Internet access that sometimes fails.

However, Chant recently shared that there are currently new changes in her community since our interview last year:

I’m noticing the shift in ethnic/racial dynamics of the community, so I’m quite sure within the next year that service will be available as more people of the majority, *White*, move into my community. That service will become available because they will scream and shout loud enough and their voices will be heard although the people currently in the community scream and shout but we are silenced because our voices don’t count as loudly as theirs.

Chant's raw narratives describe accounts of racism, oppression, inequalities, and digital inaccessibilities in urban communities that have made *place* a disrupted space where those outside the place determine "who gets what," "why and how," and "for how long."

Researcher's Counter-stories. As digital literacy researchers of color, we occupy and negotiate our lives and selves in the research we conduct. As part of our roles as scholars, we constantly negotiate, re-negotiate, and co-construct ourselves to present the work about which we are passionate. Oftentimes, we are confronted by perceptions of the Other that need clarifying (Bochner & Ellis, 1996). For instance, Tisha experienced many conflicting counter examples when she presented the complex and taken-for-granted digital literacy practices of a female participant she studied, at various literacy conferences. Tisha carefully watched the gestural and spatial movements of conference attendees when sharing how this research was conducted in the participant's *bedroom*, as this was the site where the family's digital literacy tools were located and where practices occurred. Other raised glances and comments exploded after Tisha disclosed how the participant and her then nine-year-old son would often text and instant message each other less than two feet away from one another. Many conference attendees, showed frowns, confused looks, and the shaking of heads to describe their lack of understanding why the mother participant would want to text and IM than talk with her son. In addition, when Tisha shared that the participant was from a low-income population, a presentation attendee handed her a huge book containing several literacy practices Tisha should use with the participant to "boost" her literacy skills. Also, after discussing the digital literacy practices of how a middle-class mother and son composed a digital story together, one individual mused that "it would have been interesting to know how this study would have been done (panned out) from a family from low-income."

These examples demonstrate issues of social class, status, and contextual power that are at times hidden in research spaces, but that nevertheless open up heuristics for us to understand these spaces. When individuals in power heard Tisha's research focus, the following response was given: "You need to get out [of the homes]. You need to go into the schools [to conduct research]!" Such feedback suggested that Tisha's research scholarship was viewed as irrelevant, incomprehensible, or undervalued. The fact that Tisha's research is burgeoning across the northern United States appeared to demonstrate that perhaps it was not deemed purposeful in the South. However, Tisha contend that studying families' digital literacy practices—or any practice—in any home constitutes rich spaces that Talburt (2000) calls "emergent, incomplete, and unpredictable" (p. 19).

Study 2

Silvia – "We are Not Even on the Map"

Participants' Counter-stories. In Silvia's work with immigrant families in a small town in Georgia, Silvia became aware of the reconfiguration of place and community in the lives of families who were encountering digital literacies for the first time. Mediated by geo-location services in smartphones and Google applications, Silvia and the parent participants in the Family Literacy Program were able to zoom into their current city, the mobile home neighborhood where many of them lived, and the small towns of southeast Mexico that many have not visited in more than 10 years. In the planning of a field trip to the local library, Silvia guided them in the search of directions from the mobile home community to the central areas of the city. However, they could not find their address—Google Maps[®] would not zoom into their mobile home lots. "*Ni en el mapa salimos / We are not even on the map*" argues one of the mothers, Olga, whose declaration made the erasure of their presence—both online and in the city—visible. Similar

comments were made by Diana and Mireya, who are also residents in the same community; however, their comments were about their *ranchitos* of origin: they are close to small cities, but they also fail to show up on a Google map. But, as Mireya explains, many of the residents of her hometown *ranchos* are now living in Magnolia—more of them are “here” than “there.”

As part of the New Latino Diaspora community (Hamann, Wortham, & Murillo, 2002), residents of immigrant origin like Olga face the challenges and opportunities of entering a sociopolitical space where the positioning of Latinos by mainstream residents breaks molds of traditional black/white race relations, and intersects with existing issues of class difference and spatial segregation. In the focal county where Silvia conducted this study, Latinx residents came from various nation-states (Guatemala, Honduras, Mexico), but were lumped together under the pan-ethnic identity marker as “Hispanics” or “Latinos.” Yet, connections to specific nation-states and to the particular localities of origin allowed participants in this project to co-construct a shared allegiance, and use these affiliations to co-construct powerful counter narratives about their funds of knowledge. Diana, Mireya, and Rosalinda searched for photos of their cities and *ranchos* of origin in a project aimed to design digital slide shows for their children. Prompted by the sharing of these images with their peers in the sessions, pictures of gazebos, churches, and majestic landscapes predominated in their finished products, as well as explanations of traditional local practices. The effort to share these images with their children, and for the children to understand their parents’ heritage, drove parents and mothers in this program to visually document their transnational affiliations.

While issues of race relations were not overtly discussed in the sessions of this program, it is relevant to point out that participants in the study came from different nation-states; most of them were of Mexican-origin, but some were from urban areas in Guatemala and Honduras.

Nation-state affiliation was constructed within this parent group as a relevant identity marker; we compared and contrasted variations in dialect, relevant traditions, content in their home countries' curricula, and religious traditions. As mentioned by Smith (2006), Latinos in the South face complicated and unique circumstances in affiliation and coalition forming: discrimination conditions vary among immigrants based on undocumented statuses, language differences, and non-unifying constructions of race in the Latinx community. Yet, specific place-based affiliations—from localities as small as *ranchitos*, to the various nation-states represented in the class—were predominant in interactions and self-ascribed identification within the parent group.

As a researcher who shares a cultural and linguistic background with the group, but who grew up in a city in a different region, Silvia realized that she was an outsider to the erasure and limited visibility of their local and transnational places of residence, which was reified by our online searches in Google maps. Silvia documented such struggles and concerns, noticing the rural-to-rural migration pattern in some of the participants' cases, where access to services and public transportation was limited both “here” and “there.” However, through the assemblage of digital images featuring landmarks, events, and local practices, participants found the resources to reconstruct their homelands in ways that online maps failed to do (Noguerón-Liu, & Jordan, in press). These visual representations counter the invisibility of locations relevant to them, and reveal critical insights on the ways spaces and places can be reimagined with online resources.

Researcher's Counter-stories. Silvia explored how intersections of race, space, and place in the new South reiterated the unique and parallel visibility of one community in two nation-states: a rural-to-rural migration where individuals compare their communities of origin—which, like them, have been transplanted to areas equally marginalized and peripheral to mainstream “cities” and desirable neighborhoods. However, by sitting next to Mireya, Diana, Olga, and

Rosalinda, Silvia experienced digital tours to the plazas, fields, and churches they held dearly in their minds and hearts—places that they had not seen in years, but followed and appreciated in photos shared by relatives and tourists on Facebook, Flickr, and other sources for Google Images. During program sessions, Silvia had the opportunity to support the parent participants in the editing and organizing of the photos of their gardens, chili plants, and soccer fields in the Magnolia neighborhood, the place where their children live, play, and learn.

While transnational perspectives of language and literacy research illuminate the great potential of digital technologies to maintain and reify transnational affiliations (Lam & Warriner, 2012), it is relevant to rethink the ways that immigrant communities rethink and reproduce these ties in new migration settings, where existing legacies of segregation and discrimination shape contemporary intercultural relations. By sharing and presenting participants' perspectives to school personnel and other local institutions, Silvia became aware of her own limited understanding of the home communities of families who were foreign-born, like her. Making sense of the heterogeneity of the Latinx experience is not only relevant for individuals who do not share this cultural and linguistic background; it is important for Latinx researchers to interrogate and reflect on their own positionalities, and on the potential of digital resources to build bridges of understanding within groups of Latinx descent---understanding of the unique histories, traditions, and challenges in various nation-states and regions.

Study 3

Marva - “Split like an old Fifties’ B-movie Town”

Participants’ Counter-stories. Austin is stratified by economics and race, with most marginalized populations living east of the interstate that splits the city like the railroad in an old 1950s’ B-movie town. The further west you go, the wealthier (and whiter) the population gets;

conversely, the population becomes browner and more impoverished further east of the interstate. While a good number of middle-class Latinx families occupy the centrally located neighborhoods, only a sprinkling of black children appeared in schools west of the interstate. Census data classified Austin as a non-majority city, as the white population has dipped below 50%. However, the African Americans percentage of the population represented a shallow decline (www.austintexas.gov) (United States Census, 2011).

Marva's school was one such "sprinkle" school. The population draws from comfortable southwestern suburbs, rural areas south of the city limits, and a few trailer parks that line the major road just north of the campus. At the time of Marva's research, the student population was approximately 40 percent Latino/a, 37 percent white, and the rest were an even percentage of African American children and other racial categories. Thirty-six percent of the students received free and reduced lunch. As such, the school had the misfortune of occupying a middle place: its population was not wealthy enough to reap the monetary and time benefits of stay-at-home moms, and was not nearly poor enough to qualify for federal funds based on free and reduced lunch numbers. For most of Marva's tenure, she was the only black teacher at the school. There was one Latino teacher in every grade level except kindergarten because each grade required at least one bilingual teacher. The bilingual kindergarten teacher was white.

Despite the lack of teachers of color at the school, race was not an issue at Marva's school. Rather, it was not mentioned, except to comment on its lack of importance or non-existence. The teacher who taught next door to Marva often declared that she "didn't see color." After Marva started graduate school and read the research, Marva told her that such a statement was on a "list of the worst things you could possibly say" (Rains, 1998). Nevertheless, Marva could not break her habit. It was ingrained in that space as the ideal perception. At her school,

the equity traps (McKenzie & Scheurich, 2004) of *racial erasure* (hooks, 1992) and *employment of the gaze* (Foucault, 2002) that enforced color blindness was a badge of honor.

It was in that space that Marva conducted research on African American children's digital storytelling. That year, there were 12 first graders classified in school records as African American, and 8 of their families agreed to participate in the study. When Marva received the permission forms, she noticed that, on some of them, the parents expressed concerns that their children might feel singled out. Others noted that their children were not entirely African American, but were of mixed race. While the school administration expressed total support of Marva's research, the teachers often whispered their worries that the children would figure out that they were invited to the computer lab at 2 p.m. on Fridays because they were Black. The teachers who did not whisper conveniently forgot to send their students at the appointed time. Between parent notes and teachers' comments and actions, Marva felt the heavy weight of "The Gaze", which is often employed to "norm[alize] behavior" (McKenzie & Scheurich, 2004, p. 620). To abide to, what we call, everyone's *sensitive insensitivities*, also relating to white fragility (DiAngelo, 2011), Marva employed some strategies to ease their minds. Marva sent home more permission slips and ended up with a larger pool of students that represented all races at the school. In this way, Marva invited other children to participate, which seemed to soothe everyone's feelings enough so that, after a while, people stopped noticing when she only called for the African American children.

For the children, this project was their first chance during the school year to create their own stories, digitally or otherwise. Examples collected of their previous class work included mostly prompt writing, and "what did you do on the weekend" journal entries that kept the students busy while their teachers collected notes and lunch money. But once they were freed

from prompts and the time-limited boundaries of Monday morning business time, the first graders produced amazing and unique stories. They told the stories they wanted to tell for their own purposes, whether it was to create a tale of knights and kings, to make friends laugh, or to simply make a friend. The fact that the storytelling was digital, amplified their excitement (Solomon, 2009). The first graders used multimodal tools to express themselves as individuals beyond their capabilities with traditional tools. Beyond literacy skills, the children also used digital storytelling to express their whole selves, including their Black selves.

Most of the students drew upon cultural resources like *call and response* and *signifying* (Smitherman, 1977) to increase the production values of their stories. Given the opportunity, one student chose to share her bi-racial story. She changed her mouse tip hue to pink for her White friends, and colored in Black faces to represent her mother and granny. In her self-portrait, she merely outlined her own face with Black, thus illustrating her multi-racial identity.

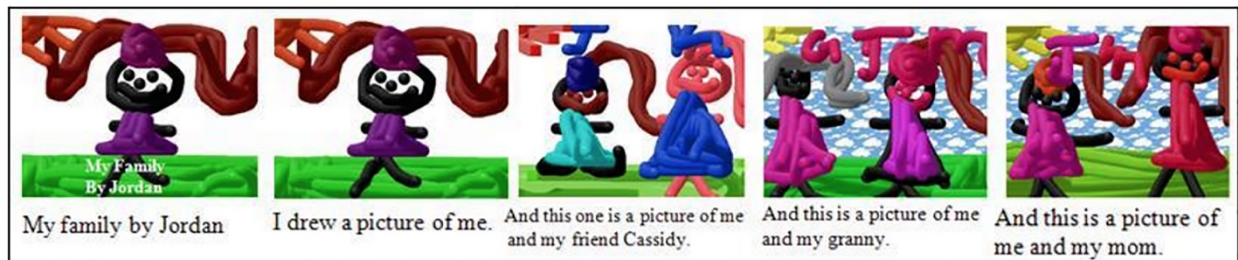


Figure 3. Digital Story Transcript from Marva's project

In the space created by the digital storytelling project, race was not as invisible as it was decreed outside the computer lab's door.

Researcher's Counter-stories. In mid-April 2009, near the end of Marva's digital storytelling project, one of the first grade teachers stopped her in the hall. She said, half-jokingly, "What'd you do to my kid?" She had assigned the students in her class to write to the prompt,

“Describe a perfect Easter egg.” Byron, one of the participants in the study, chose to ignore the imposed limits of the assigned prompt and instead tell a 4-page story about an alien invasion spawned from an Easter egg, complete with a magical sword, a dying king, and a Pokémon character. Marva smiled and shrugged, but said to myself, “Go to it, Little Man. Let it out. Let it all out.”

Working on the present project with Tisha and Silvia gave her the opportunity to reflect on who she was during that particular digital storytelling project, and on who she is now as a researcher. By sharing ideas with Tisha and Silvia, Marva realized how much she conformed to the structure of her space. Racial erasure was the enforced rule when Marva implemented her project, and in the military and West Texas schools that she herself attended through K-12. Enforced color blindness did not frustrate her—she had long ago developed strategies to worked around it. Marva’s strategy was to invite a larger pool of children to the computer lab to obscure the Blackness of her actual targets. Similarly, in a competition for internal grants that Marva wrote just one year ago, she molded her study design to fit a quantitative format and topic that was assured most preferred by the committee, even though it was not *her* most preferred format and topic. While reflecting on the frustrations of Tisha, with those from positions of power, it struck Marva of much she tended to accept the confines of space and place.

Conclusion and Implications

In this article, we aimed to illustrate the complex ways in which African American and Latinx participants and researchers engage in collaborative digital literacy projects where the relation of place, space, and racial identity intersect. We pointed to the ways in which master narratives and inequality issues emerge in our interactions with participants about technology access, visibility, and self-representation. In Tisha’s study, equitable access to digital services

was bound to the social constructions and stigma associated with a “neighborhood,” as expressed in the counter narrative shared by Chant. In Silvia’s study, the small size and scale of a mobile home community and a Mexican *ranchito* were not visible in Google maps, which shows the implications of invisibility of rural spaces or low-income neighborhoods in two nation-states. In Marva’s study, the political and ideological space of her school sanctioned the acknowledgement of racial differences, when her colleagues mentioned “I don’t see color,” and her study participant pool had to shift to avoid race matter discussions. In Silvia’s and Marva’s studies, erasure and visibility were central constructs in whether or not participants’ identities and regions or origin could or should be represented in digital ways. However, in all three studies, participants found ways to use digital resources to make visible their connections to place and racial identities: Latinx mothers assembled images of multiple landmarks around their hometowns, and biracial children used the color palette in ways that represented their racial identities. Through these oral and multimodal counter narratives, participants’ voices, limitations, and dominant assumptions about the spaces and practices mattered in their communities.

As literacy researchers who aim to establish participatory and reciprocal relationships with the communities described above, we negotiate multiple roles coming in as digital literacy “experts.” However, we find that digital resources were valuable mediating tools to illuminate our understanding of social space and identity in urban and rural regions in Georgia and Texas. While we may serve as mentors or facilitators in the use of digital media production resources, we aim to understand how and why these resources may be of use (or not) to the families and students we work with. Through this process, we problematize assumptions about technology as

the “great equalizer” in technological determinism narratives (Warschauer, 2003), and illustrating how participants understand and address digital inequality.

We have shared stories of three different places in the south, all where the researchers found the implications of race embedded into the very fabric of the community – from infrastructure to social expectations. These implications shaped the researcher, interactions between researchers and subjects, and even the research product. The narratives told here call for further studies on barriers to digital equality (i.e., the luxury of internet choice being unavailable in neighborhoods of color or appearing invisible on Google maps) and their effect on the communities in the south. A closer exploration of how the intersections of race, space, and place should shape the data and outcomes of literacy research concerning communities of color.

The three studies presented here provide a hopeful, inspirational picture of how digital literacies can be a tool for navigating the limits of space, race, and place. Most of the participants found the counter-stories they wanted to tell through digital tools. Yet, the three researcher’s counter-stories may serve as a warning to future researchers of color that their output can be distorted by those same limits. Finally, this piece provides awareness to researchers of all ethnicities that the digital terrain they travel is one where issues of race, place, and space are critical considerations when studying and reporting digital literacy research in the 21st century.

Notes

1. The term Latinx is an inclusive term of all gender identities (instead of the binary identities in Latino/Latina/Latin@). This term will be used to describe persons with origin to countries in Latin America.
2. The *Dig-A-Fam: Families’ Digital Storytelling Project* was funded by the National Council of Teachers of English’s Research Foundation.

3. *Family Literacy - Clase de Computación Project* was funded by the University of Georgia Research Foundation.

References

- Anderson, L. (2006). Analytic autoethnography. *Journal of Contemporary Ethnography*, 35(4): 373-395.
- Barton, D., & Hamilton, M. (2000). Literacy practices. In D. Barton, M. Hamilton, & R. Ivanic (Eds.), *Situated literacies: Reading and writing in context* (pp. 7-15). New York, NY: Routledge.
- Barton, D., Hamilton, M., & Ivanic, R. (Eds.). (2000). *Situated literacies: Reading and writing in context*. London, UK: Routledge.
- Beach, R., Anson, C., Breuch, L. K., & Swiss, T. (2009). *Teaching writing using blogs, wikis, and other digital tools*. Norwood, MA: Christopher-Gordon.
- Bell, D. (1980). Brown vs. Board of Education and the interest-convergence dilemma, *Harvard Law Review*, 93, 518–533.
- Bertrand, N. (2015, March 24). A lawyer in Austin, Texas has admitted putting ‘exclusively for white people’ stickers on store. *Business Insider*. Retrieved from <http://www.businessinsider.com>
- Blackburn M. V., & Clark C. T. (2014). How moments (and spaces) add up to lives: Queer and ally youth talking together about LGBTQ-themed books. In C. Compton-Lilly & E. Halverson (Eds.), *Time and space in literacy research* (pp. 93-106). New York, NY: Routledge.
- Bochner, A. P., & Ellis, C. (1996). Talking over ethnography. In C. Ellis & A. P. Bochner (Eds.), *Composing Ethnography: Alternative Forms of Qualitative Writing* (pp. 13-45). Walnut Creek, CA: Alta Mira Press.
- de Certeau, M. (1984). *The practice of everyday life*. Berkeley, CA: University of

California Press.

- DiAngelo, R. (2011). White fragility. *The International Journal of Critical Pedagogy*, 3(3).
- Dooley, C., Lewis Ellison, T., & Welch, M. (2016). Digital participatory pedagogy: Digital participation as a method for technology integration in curriculum. *Journal of Digital Learning in Teacher Education*, 32(2), 52-62.
- Drouin, M. A. (2011). College student's text messaging, use of textese, and literacy skills. *Journal of Computer Assisted Learning*, 27.1, 67-75.
- Drouin M., & Davis C. (2009). R u txtng? Is the use of text speak hurting your literacy? *Journal of Literacy Research*, 41, 46-67.
- Foucault, M. (2002). Space, knowledge, power. In J. D. Faubion (Ed.), *Power: Essential works of Foucault* (Vol. 3, pp. 349-364). London, UK: Penguin.
- Gainer, J., & Lapp, D. (2010). *Literacy remix: Bridging adolescents' in and out of school literacies*. Newark, DE: International Reading Association.
- Gee, J. P. (2008). Learning and games. In Salen, K. (Ed.), *The ecology of games: Connecting youth, games, and learning*. Cambridge, MA: MIT Press.
- Hall, T. D., & Damico, J. (2007). Black youth employ African American vernacular English in creating digital texts. *Journal of Negro Education*, 76(1), 80-98.
- Hamann, E., Wortham, S. & Murillo, E. (Eds.) (2002). *Education in the new Latino diaspora*. Westport, CT: Ablex Press.
- Harman, R., & Varga-Dobai, K. (2012). Critical performative pedagogy: Emergent bilingual learners challenge local immigration issues. *International Journal of Multicultural Education*, 14(2), 1-17.

- Hess, C., Henrici, J., & Williams, C. (2011). *Organizations Working with Latina immigrants: resources and strategies for change*. The Institute for Women's Policy Research. Washington, DC.
- Hobson, M. (2009). *The dawning of the Black new south: A geo-political, social and cultural history of Black Atlanta, Georgia, 1966 – 1996*. Unpublished dissertation. University of Illinois at Urbana-Champaign.
- hooks, b. (1992). *Black looks: Race and representation*. Cambridge, MA: South End.
- Hull, G., & Katz, M. L. (2006). Crafting an agentive self: Case studies of digital storytelling. *Research in the Teaching of English*, 41(1), 43-81.
- Hull, G., Zacher, J., & Hibbert, L. (2009). Youth, risk, and equity in a global world. *Review of Research in Education*, 33(1), 117-159.
- Ito, M., Gutierrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K.,... Watkins, S.C. (2013). *Connected learning: An agenda for research and design*. Retrieved from <http://dmlhub.net/publications/connected-learning-agenda-research-and-design>
- Jenkins, H., Clinton, K., Purushtoma, R., Robison, A.J., & Weigel, M. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. Retrieved from the MacArthur Foundation website: http://digitalllearning.macfound.org/atf/cf/%7B7E45C7E0-A3E0-4B89-AC9C-E807E1B0AE4E%7D/JENKINS_WHITE_PAPER.PDF
- Kirkland, D. (2013). *A search past silence: The literacy of young black men*. New York, NY: Teachers College Press.
- Knobel, M., & Lankshear, C. (2008). Remix: The art and craft of endless hybridization. *Journal of Adolescent and Adult Literacy*, 52(1), 22-33.

- Kress, G., & van Leeuwen, T. J. (2001). *Multimodal discourse: The modes and media of contemporary communication*. London, UK: Arnold.
- Labbo, L. D. (2004). Computer author's chair. *The Reading Teacher*, 57(7), 688.
- Lam, W. S. E., & Warriner, D. S. (2012). Transnationalism and literacy: Investigating the mobility of people, languages, texts, and practices in contexts of migration. *Reading Research Quarterly*, 47(2), 191-215.
- Leander, K. & Sheehy, M. (Eds.) (2004). *Spatializing literacy research and practice*. New York: Peter Lang.
- Leander, K., Phillips, N., & Taylor, K. (2010). The changing social spaces of learning: Mapping new mobilities. *Review of Research in Education*, 34(1), 329-394.
- Lewis, T. Y. (2011). Family digital literacies: A case of awareness, agency, and apprenticeship of one African American family. In P. J. Dunston, L. B. Gambrell, K. Headley, S. K. Fullerton, P. M. Stecker, V. R. Gillis, and C. C. Bates (eds.), *60th Literacy Research Association Yearbook* (pp. 432-446). Oak Creek, Wisconsin: Literacy Research Association.
- Lewis, T. Y. (2013). "We txt 2 sty cnectd.:" An African American mother and son communicate: Digital literacies, meaning-making, and activity theory systems. *Journal of Education*. 193(2), pp. 1-13.
- Lewis, T. Y. (2014). Apprenticeships, affinity spaces, and agency: Exploring blogging engagements in family spaces. *Journal of Adolescent and Adult Literacy*, 58(1), pp. 71-81.

- Lewis Ellison, T. (2014). Digital ontologies of self: Two African American adolescent's co construct and negotiate identities through The Sims 2. *Digital Culture & Education*, 6(4), 317-340.
- Lewis Ellison, T. (2016). Artifacts as stories: Understanding families, digital literacies, and storied lives. *Journal of Adolescent and Adult Literacy*, 59(5), 511–513.
- Lewis Ellison, T., Evans, J. N. with Jim Pike (forthcoming, 2016). Minecraft, teachers, parents, and learning: What they need to know and understand. *School Community Journal*.
- Lewis Ellison, T. (2017). Family stories, texts, meaning: A study of artifacts during a digital storytelling workshop. In C. Burnett, G. Merchant, B. Parry (Eds.), *Literacy, media and technology: Past, present and future*. Bloomsbury Press.
- Lewis Ellison, T., & Wang, H. (under review). Competence, resistance, and voice.: Digital story sharing and agentic practices in an African American parent-child dyad.
- Lippard, C., & Gallagher, C. (2011). Introduction: Immigration, the new south, and the color of backlash. In C. Lippard & C. Gallagher (Eds), *Being brown in Dixie: Race, ethnicity and Latino immigration in the new south* (pp. 1-24). Boulder, CO: First Forum Press.
- McKenzie, K., & Schuerich, J. (2004). Equity traps: A useful construct for preparing principals to lead schools that are successful with racially diverse students. *Educational Administration Quarterly*, 40(5), 601-632.
- Miller, S. (2014). Spatializing social justice research in English education. In C. Compton-Lilly & E. Halverson (Eds.), *Time and space in literacy research* (pp. 122-133). New York, NY: Routledge.
- Mills, K. A., & Comber, B. (2013). Space, place and power: The spatial turn in literacy research. In K. Hall, T. Cremin, B. Comber, & L. Moll (Eds.), *International handbook of research*

- in children's literacy, learning and culture* (pp. 1-26). London, UK: Wiley-Blackwell Publishing, Inc.
- Morrell, E. (2005). Critical participatory action research and the literacy achievement of ethnic minority youth. *National Reading Conference Yearbook*, 55, 60-77.
- New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66, 60-92.
- Noguerón-Liu, S., & Jordan, J. (in press). Remembering Michoacán: Transnational mediaflows and visual representations of the homeland in New Migration Contexts. *Research of the Teaching of English*.
- Parker, J. K. (2010). Teaching tech-savvy kids: Bringing digital media into the classroom, grades 5-12. Thousand Oaks, CA: Corwin Press.
- Passel, J., Cohn, D., & Lopez, M. H. (2011). Hispanics account for more than half of nation's growth in past decade. Washington, D. C.: Pew Hispanic Center.
- Pew Hispanic Center. (2005). *The new Latino south: The context and consequences of rapid population growth*. Washington, D. C.: Author.
- Pew Hispanic Center. (2013). *Hispanic Trends*. Retrieved from <http://www.pewhispanic.org/>
- Pink, S. (2007). *Doing visual ethnography* (2nd ed.). Los Angeles, CA: SAGE.
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1-6.
- Rains, F. V. (1998). Is the benign really harmless?: Deconstructing some "benign" manifestations of operationalized white privilege. In J. L. Kincheloe, S. R. Steinberg, N. M. Rodriguez, & R. E. Chennault (Eds.), *White reign* (pp. 77-101). New York, NY: St. Martin's Press.
- Reardon, M. (2008, September 22). Americans text more than they talk. *CNET News*. Retrieved

from http://news.cnet.com/8301-1035_3-10048257-94.html.

- Smith, B. E. (2006). Across races and nations: Social justice organizing in the transnational South. In H. Smith & O. Furuseth (Eds.), *Latinos in the new south: Transformations of place* (pp. 235-256). Burlington, VT: Ashgate Publishing.
- Smitherman, G. (1977). *Talkin and testifyin: The language of Black America*. Detroit, MI: Wayne State University Press.
- Soja, E.W. (2010). *Seeking spatial justice*. Minneapolis, MN: University of Minnesota Press.
- Solomon, M. (2009). True adventures of students writing online: Mummies, vampires and schnauzers, oh my! In A. Herrington, K. Hodgson and C. Moran (Eds.) *Teaching the new writing: Technology, change, and assessment in the 21st century classroom*, pp. 21-38. New York: Teachers College Press.
- Solomon, M. (2012). "Why can't you just say, 'It's cute'?" The Role of Audience in First Graders' Digital Storytelling. *Talking Points*, 24(1), pp. 14-22.
- Solórzano, D. G., & Yosso, T. J. (2001). Critical race and LatCrit theory and method: Counter storytelling. *International Journal of Qualitative Studies in Education*, 14(4), 471-495.
- Solórzano, D. G., & Yosso, T. J. (2002). Critical race methodology: Counter-storytelling as an analytical framework for education research. *Qualitative Inquiry*, 8(1), 23-44.
- Street, B. (1995). *Social literacies: Critical approaches to literacy in development, ethnography and education*. New York, NY: Longman.
- Talbert, S. (2000). *Subject to identity: Knowledge, sexuality, and academic practices in higher education*. Albany, NY: State University of New York Press.
- United States Census. (2011). Black population in U.S. 2010
<http://www.census.gov/prod/cen2010/briefs/c2010br-06.pdf>

Urrieta, L. Jr. & Villenas, S. (2013). The legacy of Derrick Bell and Latina/o education: A critical race testimonio. *Race, Ethnicity and Education, 16*(4), 514-535.

Vasudevan, L. (2006). Making known differently: Engaging visual modalities as spaces to author new selves. *E-Learning, 3*(2), 207-216.

Villenas, S. (1996). The colonizer/colonized Chicana ethnographer: Identity, marginalization, and co-optation in the field. *Harvard Educational Review, 66*(4), 711-731.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Warschauer, M. (2003). *Technology and social inclusion: Rethinking the digital divide*. Cambridge, MA: The MIT Press.

Warschauer, M., & Matuchniak, T. (2010). New technology and digital worlds: Analyzing evidence of equity in access, use, and outcomes. *Review of Research in Education, 34*(1), 179-225.

Watkins, S. C. (2009). *The young and the digital: What the migration to social network sites, games, and anytime, anywhere media means for our future*. Boston, MA: Beacon Press.

Generation Gap Between Students' Needs and Teachers' Use of Technology in Classrooms

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Abstract

In the 21st century, technology is a pervasive presence in the classroom. Unintended consequences of a technologically rich classroom learning environment emerge due to the dichotomy between 21st-century learners' and teachers' perceptions of the need to use technology. Several factors affecting the generation gap between teachers and students in classrooms are shared such as characteristics of 21st-century learners, teacher's perceptions of technology, student's ability to use technology independently, teacher training and the need to reshape pedagogy based on national education standards focused on technology use. The EMSCI Model provides teachers with a process to teach students how to use technology independently and suggests a pedagogical paradigm shift towards constructivist teaching to offset the generation gap.

Key Words: Technology, pedagogy, generation gap, constructivist, 21st-century learners

The increase in availability and access to technology in the last 20 years has highlighted the gap between students' needs and teachers' use of technology in classrooms. By 2006, two-thirds of all PK-12th grade students had a computer in their home and half of those had the Internet (Calvert, Rideout, Woolard, Barr & Strouse, 2005; DeBell & Chapman, 2003; Gutnick, Robb, Takeuchi & Kotler, 2011). In 2011, children between 5-9 years of age used the Internet about 28 minutes a day increasing to 46 minutes between the ages of 8-10 years. This is double the amount of time similarly aged children spent on the Internet in 2006 (Gutnick, et.al, p. 16). The prevalence of technology used by the youngest in our population speaks to why teachers need to include technology in their pedagogy.

Current PK-12 students are considered to be Digital Natives. Prensky coined the term Digital Native to define "native speakers of technology, fluent in the digital language of computers, video games, and the Internet" (2005-06, p. 9). Prensky described teachers as Digital Immigrants since most teachers were born before widespread use and availability of technology (Prensky, 2005-06). A synonym used interchangeably in education for Digital Natives is 21st Century Learners. These two terms represent students who are currently experiencing "...a profound gap between the knowledge and skills most students learn in school and the knowledge and skills they will need in typical 21st-century communities and workplaces" (Gura & Percy, 2005, p.32).

Twenty-first-century learners want to use technology in authentic ways. They expect to be technically competent in basic, application-specific tasks, such as creating a PowerPoint presentation, but also expect to be able to use technology for critique and analysis independently. Twenty-first-century learners use technology such as video games, social media, email, text

messaging, the Internet, digital music players, cell phones, computers and tablets in their daily lives. Prensky (2005-06, p. 13) claims "...students, who are empowered in so many ways outside their schools today, have no meaningful voice at all in their own education..." regarding technology use in their classroom. A student-centered classroom in the 21st century is one in which students are engaged in using technological tools to assist them in constructing a deeper understanding of concepts. While students' welcome technology as a familiar learning tool, too many teachers use technology as "electronic worksheets" (Wilhelm, 2004, p. 45). In some classrooms, technology is a reward for on-task behavior rather than an everyday tool to provide meaningful and engaging teaching and learning.

...the billions schools have spent on computers have had little effect on how teachers and students learn...The reason for this disappointing result is that the way schools have employed computers has been perfectly predictable, perfectly logical—and perfectly wrong...Using computers this way will never allow schools to migrate to a student-centric classroom" (Christensen, Horn & Johnson, 2008, p. 72-73).

Becker (2000) shared that children commonly use computers for information gathering or word processing. However, utilizing technology in such a static manner denies the interactive and engaging element embedded in most technological tools. Teachers know that it is this interactive and engaging element in technology that attracts students to technological tools and assists them in constructing a better understanding of their thinking through their experiences. Twenty-first-century learners need a pedagogical shift in classrooms, so technology is offered for use to construct their knowledge of academic content.

Some unintended consequences of technology creating a generation gap between teachers' use and students' need for technology are 21st-century learner characteristics, teachers' perception of using technology and the way technology reshapes pedagogy. A few additional factors affecting the generation gap between teachers' use and students' needs to use technology in a classroom will be discussed such as the Digital Divide, the ability of students to be able to use technology independently, professional development training and technological integration using national education standards. All of these factors provide a broad view of how technology has unintentionally created a generation gap between teachers and students in classrooms. Lastly, recommendations for reimagining the classroom to decrease the generation gap between students and teachers is shared.

Characteristics of 21st Century Learners

During the 1980s, classrooms in the United States held a ratio of one computer for every 125 students. By 1997, the availability of technology increased the number of computers changing the ratio dramatically to one computer for every ten students. By 2004, the ratio had changed to one computer for every five students (Clements, 1999; Coley, Cradler, & Engle, 1997, U.S. Department of Education, 2004).

As early as 2004, 99% of schools in the United States utilized an Internet connection (The United States Department of Education, 2004). As such, "Technology is ubiquitous, touching almost every part of our lives....Properly used; technology will help students acquire the skills they need to survive in a complex, highly technological knowledge-based economy (Edutopia, 2008, p.1)." Since students live in a world of engaging, interactive technology, it is important to include technology in schools for teaching and learning (Becker, 2000; Calvert et. al, 2005; Chiong & Shuler, 2010; ISTE, 2010; Lisenbee 2009; NAEYC, 2012). Due to the

expansive nature of technology since 2004, a generation gap has been recognized and explained as a digital divide between students and teachers.

The digital divide encompasses many factors beyond a generation gap between students' need to utilize technological tools for learning in their classroom and teachers' ability to incorporate technology into their pedagogy effectively. The definition of the digital divide is "gaps in access to and use of computers based on income, race, or parent education." (Calvert, et.al, 2005, p. 592). When viewing the generation gap between students and teachers, the expectations from technology by each cohort are drastically different. Students consider technology as a tool to communicate and interact with others including as a method to demonstrate their understanding through multimodal interactions. Teachers view technology as a tool to research and present information in a visual manner.

Many teachers are not comfortable allowing students to independently explore and construct their knowledge using multimodal interactions with technology when teachers, themselves, are not experts in a vast array of technological tools. This gap between students' expectations and teachers' use of technology in a classroom creates a disconnect between students and teachers. While teachers need to guide instruction for student learning, learning occurs best when students are actively involved in using technology, not watching a teacher use technology (Prensky, 2008; Grabe & Grabe, 2007). Therefore, teachers' perception of using technology in a classroom depends not only on their ability to use technology but being comfortable in offering students an opportunity to use technology in their classroom independently. A key factor which contributes to the generation gap between students and teachers is whether students can independently use technology.

Teachers' Perception of Using Technology

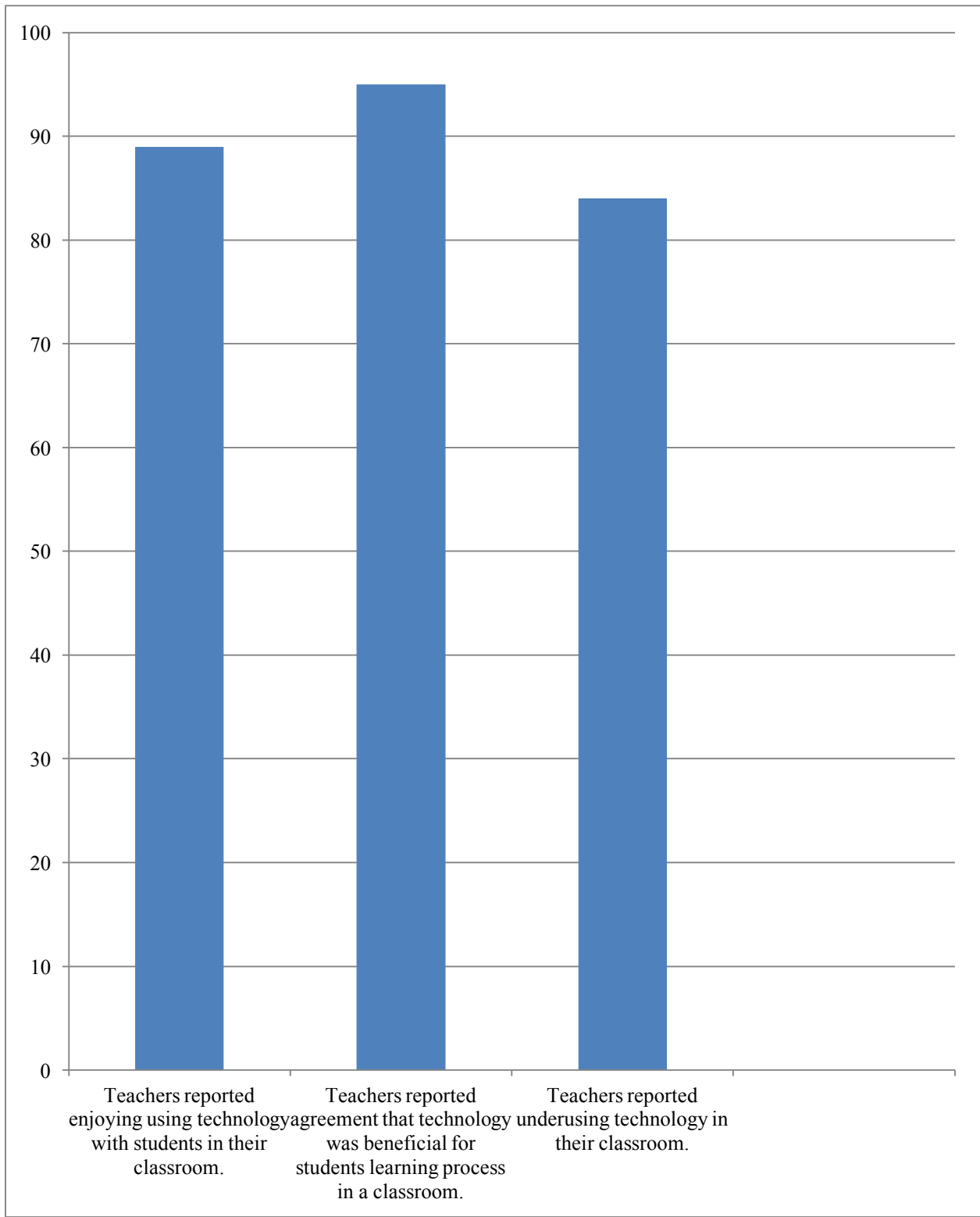
An issue contributing to the gap between teachers and students' use of technology in a classroom is the teacher's perception of technology. Research has shown that "...teachers hold a high agreement toward using computers" as an instructional practice, yet they did not "have strong beliefs about allowing children" to use technology in the classroom (Ihmeideh, 2010, p. 75). I found a similar trend when conducting a survey on teachers' perceptions of technology use for instruction with PK-5th grade elementary teachers.

A survey placed in 17 teachers' mailboxes at a public elementary school in an urban area of a Midwestern state along with a letter asked teachers to answer the questions and return the survey in one week. The methodology chosen for this survey was a selective sample. The teachers ranged in teaching experience from one year to 37 years with a mean of 13 years of teaching experience. This school housed a variety of programs including multi-disabled, developmentally disabled, deaf education, and served Pre-Kindergarten to 5th-grade students.

Thirteen out of 17 teachers in the elementary school returned the survey. The survey consisted of Likert questions, using a 1-4 scale, requesting information about teacher perceptions of using technology in their classrooms. The return rate for the surveys was 76%. Analysis of frequencies on the agreement with survey statements provide data on teachers' perceptions of technology use in classrooms. The results illuminate an understanding by teachers of the generation gap between teachers' use and students' needs in their use of technology in classrooms.

Table 1 and Table 2 offer a view of the quantitative results from this survey. Table illustrates teachers' perceptions of technology use in a classroom. Eighty-nine percent of the responding teachers reported enjoying the use of technology. Ninety-five percent of the

Table 1--Teachers' Perceptions of Technology



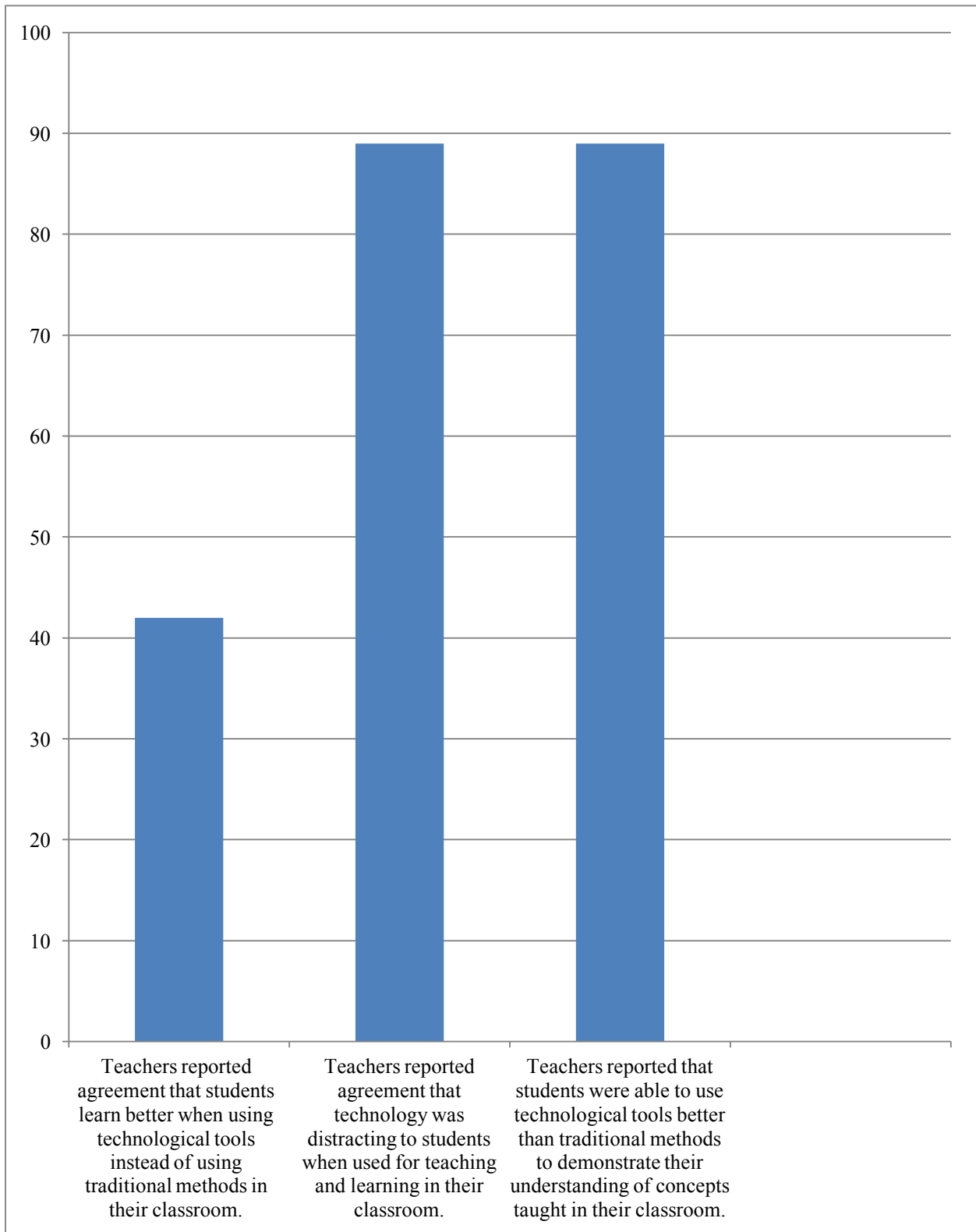
responding teachers said they felt technology was beneficial for students while 84% reported they underused technology in their classrooms.

Table 2 illustrates teachers' perceptions of student's independent use of technology in a classroom. Forty-two percent of the teachers felt students learned better when using technological methods of interaction and instruction and 89% of the teachers reported technological tools were more effective for students to demonstrate their understanding of concepts taught in a classroom. Yet, 89% of the teachers reported technology seemed to be distracting to students.

Overall, teachers' perception of technology use in the classroom was positive while their perception of students' independent use of technology in the classroom was inconsistent. The inconsistency is demonstrated by the dichotomy between the 89% of teachers designating technology was distracting for teaching and learning and the 95% of teachers agreeing student learning integrated with technology was beneficial. These results suggest that the generation gap is real. Teachers are not as comfortable letting students use technology in the classroom, but like using it to teach. Teachers understand how technology can motivate students to learn and demonstrate their understanding more efficiently using technology even though teachers don't offer independent use of technology consistently to students in their classroom.

Given the small number of teachers that participated in this survey, these findings are not generalizable to all teachers. It is important to note that this survey suggests teachers' perceptions do influence how they integrate technology in a classroom. Students cannot master independently using technology nor become productive members of the 21st century if teachers do not routinely include technology for teaching and learning in classrooms.

Table 2--Teachers' Perceptions of Student Use of Technology



Escobar and Cappella (2000) found similar results when they interviewed a small sample of students about their perception of using technology as a tool in a classroom. They found students expected to be able to use technology in a classroom. An eight-year-old shared that by using computers in a classroom students "...learn more things, and they'll be learning and having fun at the same time (Escobar & Cappella, 2000, p.187)." A 13-year-old student stated "...computers will be the future, so if you grow up with it, then you will know it (Escobar & Cappella, 2000, p.187)." These students' voices provide a perspective to understand 21st-century learners' expectations to use technology for teaching and learning in a classroom.

The burden is on teachers to bridge the generation gap by embracing the use of technology (Prensky, 2005; Buzhardt & Heitzman-Powell, 2005). Technology continuously advances in our society causing teachers' interest to be piqued, but many instructional innovations grounded in technology have been implemented and discontinued as fast as teachers have been trained to integrate them into their teaching. When schools began purchasing technological tools for classrooms, the predominant thought was to train the teachers how to use these new tools. Unfortunately, training was not the obvious fix that schools assumed it would be to get teachers to use technology for teaching and learning in their classrooms. This is due in part to how technology reshapes pedagogy. Teachers cannot just be trained to know how to use the technological tools while remaining unable to apply their understanding of how to teach or offer technology to students to independently use it in their classroom (Fryer, 2003). Training needs to focus on both teachers and students so student learning will benefit from this pedagogical shift towards integrating technology into classrooms.

Technology Reshaping Pedagogy

National education standards for students and teachers related to technology use in classrooms were developed by the International Society for Technology in Education (ISTE, 2010) to focus on encouraging active engagement, participation in groups, offering frequent interaction and connections to real world experiences. ISTE's standards are supported by performance-based standards for integrating technology into pedagogy from the Association for Childhood Education International (ACEI, 2007) and by a position statement on technology use in classrooms by the National Association for the Education of Young Children (NAEYC, 2012). As we move further into the 21st century, awareness of and responsiveness to emerging changes in classroom environments are necessary. Computers will become a powerful learning tool and resource which teachers may use to support collaborative learning in the classroom (Hyun, 2005, p. 88). Teachers are encouraged to offer technological tools as engaging, authentic, and collaborative modes of interaction among students in a classroom.

Many teachers believe that they have adopted technology simply by using electronic worksheets or projecting information on screens for students, which is not engaging or exploratory in nature. Teachers often utilize curriculum that promotes technology use in the form of teacher-driven activities, electronic worksheets, rote memorization of information, and use of computer labs to complete prescribed learning activities instead of student-led activities using multimodal interactions for students to construct their own knowledge. This outdated type of knowledge transmission is not responsive to the pedagogical changes incorporated in ISTE, ACEI or NAEYC Standards for 21st-century learners. Specific guidelines encourage the use of technology as a means to generate meaningful knowledge construction among students through engaging, authentic and collaborative modes of social and technological interaction.

Interviews conducted by Lisenbee (2009) on first-grade students regarding how it felt to use an interactive whiteboard to complete a re-telling of a story found themes of engagement, inspiration, and interaction. The students responded to interview questions with comments such as “nice to work together”, “very good”, “It felt fun”, “special”, “awesome” and “I liked just dragging it and making it falling down and making it small and getting them to go to new places” (Lisenbee, 2009, p. 68-72). Their voices expressed themes generated from utilizing technology. The comments reflected a classroom of students embracing a pedagogical shift to construct and demonstrate their understanding of academic content using technology.

As teachers infuse technology into their pedagogy through technological training and the integration of technological standards, classrooms are being reshaped to meet the needs of 21st-century learners. These types of classes are rich environments providing endless cycles of inquiry for students engaged in constructing knowledge during collaborative work. Schools are acquiring technological tools at the same pace as technology is increasing exponentially in availability and access. For example, schools purchased personal computers for classrooms to use in computer labs then began providing personal computers for individual students to use in classrooms. Interactive whiteboards, document cameras, mobile tablets and clickers were purchased by schools adding layers of available technological tools to use in classrooms. While students recognize that computers, laptops, cell phones, iPods, digital cameras, televisions, videos, interactive whiteboards and the Internet are technological tools to use in classrooms; teachers are slower to adopt new modes of technology.

When exploring technological tools available in classrooms, “Students and teachers must become creators of information and ideas, not simply users of technology” (Burns, 2005-06, p. 51). “...we can explore ways to use technology effectively in the classroom, ways that add value

to traditional curricula and reach students who fail to respond to traditional approaches” (Shields & Behrman, 2000, p. 24). To support authentic learning experiences for students that focus on their needs, abilities, and interests, teachers need to provide students with opportunities for independent multimodal interactions. Authentic learning activities that incorporate independent use of technology in a classroom support students’ innate desire to investigate their environment. Authenticity in learning activities is an essential component of appropriate curriculum in classrooms (Branscombe, Castle, Dorsey, Surbeck & Taylor, 2003). Teachers should keep in mind that “effective technology integration must happen across the curriculum in ways that deepens and enhances the learning process” to successfully reshape pedagogy (Edutopia, 2008, p. 2). As such, choosing technology requires determining if it is the best tool for learning (Murphy, DePasquaie, & McNamara, 2003).

Recommendations for Teachers

By incorporating technology into a classroom, some teachers have begun to reshape their teaching and create appropriate classrooms for 21st-century learners. Balajhy’s (2000, p. 291) interview with teachers suggests they use software primarily because it is “‘interesting and motivational for students,’ rather than for ‘mastering skills and knowledge.’” Students want to learn through activities that “promote higher level thinking, collaboration, speed, and information evaluation—i.e., those competencies required for the 21st century” (Asselin, 2001, p. 50). Technology is the language and general mode of communication 21st-century learners use to interact with each other. Teachers reimagining their classrooms and reshaping their pedagogical knowledge and skills to include technology capitalizes on students’ motivation, interest and ability to independently use technology while focusing on offsetting the generation gap between students and teachers.

Reshaping Pedagogical Knowledge and Skills

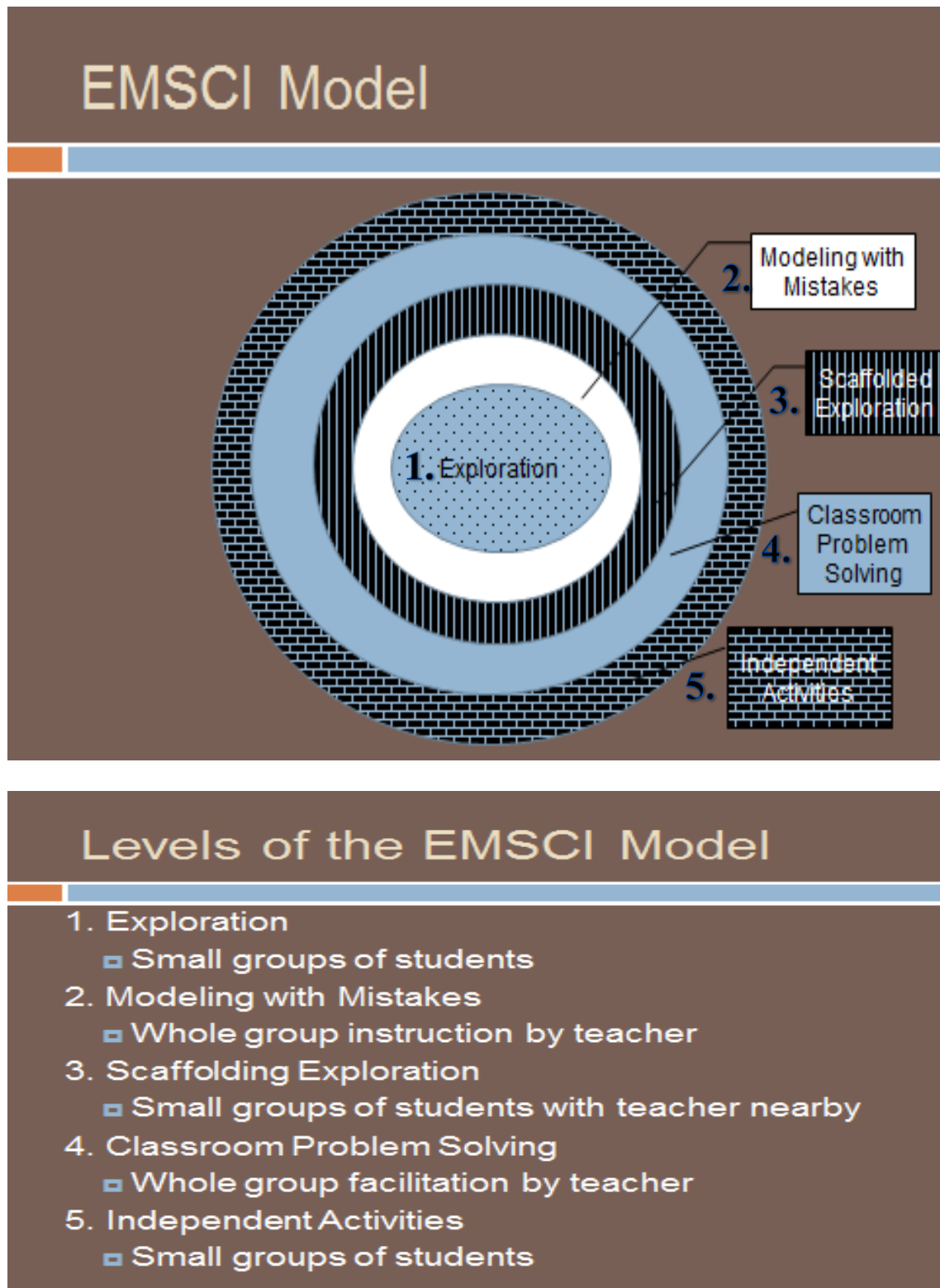
The connection between technology and student motivation is clear, but making changes in pedagogy to routinely offer students the ability to complete technologically integrated lessons is not happening regularly in classrooms. “Technology integration is a process, involving not only the physical acquisition of tools . . . , but also important changes in the ways educators think about their roles in the classroom and student roles” (Fryer, 2003, p. 4).

One method to change teachers thinking about their roles and the roles of the 21st-century learners is to offer quality training on technological tools while implementing national teaching standards related to using technology in classrooms. Applying theory to practice is a much more efficient method for training teachers to use technological tools than lecturing them about including new technology in a classroom. Teachers' resistance to change and perceptions towards using technology directly affects their interest in training to use technology as an instructional tool in a classroom and their interest in letting students use technology in a classroom. These factors relating to perceptions and resistance to change significantly affect the generation gap. The ability of teachers and students to reimagine the independent use technology supports reshaping the teaching and learning process in classrooms.

Reimagining Independent Use of Technology

Teachers interest in reimagining and reshaping classrooms provide opportunities for students to learn to use technology independently. The EMSCI Model provides exploration, scaffolding, and practice for students to build the skills they need to use technological tools independently. The EMSCI Model was created to "provide a structure for teachers to follow in an effort to ensure better student learning of how to independently use technological tools. . . ." (Lisenbee, 2009, p. 123). Figure 1 provides a visual depiction of the EMSCI Model. The

Figure 1. Levels of EMSCI Model



beginning level, Exploration, provides the initial force creating the ripples in learning needed to proceed through the other four levels which end with the ability of students to independently complete activities using technology. The EMSCI Model provides teachers with traditional instructional strategies embedded within a five-level process for teaching students how to independently use technology: Exploration, Modeling with Mistakes, Scaffolded Instruction, Classroom Problem-Solving and Independent Activities.

The first level, Exploration, provides time for small groups of two to four students to explore technology without any instruction. Exploration offers intuitive and curious questions to be answered kinesthetically and collaboratively while students manipulate and interact with technology to determine what they know and want to know about this technological tool.

The second level offers time for teachers to make purposeful mistakes as they model how to use the technology. This level, Modeling with Mistakes, is a core component providing a space where students and the teacher feel more comfortable not being an expert on all modes of technology. Viewing the teacher remaining comfortable with the learning process during initial attempts to use technology while making mistakes takes some of the pressure off students trying to use the technology also. Teachers model with mistakes during whole group instruction for this level of the EMSCI model.

The third level, Scaffolded Instruction, is completed in a small group of two to four students. Each group uses the technology while being observed by their teacher. The teacher provides scaffolding, if needed, to assist each small group in successfully navigating any issues using the technological tool. If the teacher is unable to provide scaffolding for an issue, the group of students is encouraged to continue using the technological tool while the teacher takes

notes to pitch to the whole group during the fourth level. Overall, the teacher attempts to remain a notetaker allowing each group of students to attempt to resolve issues with technology on their own. The "... teacher compiles a running list of issues that students have needed scaffolding with the most. This list will be used for the classroom problem-solving meetings." completed in the next level (Lisenbee, 2009, p. 129).

In the fourth level of the EMSCI Model, Classroom Problem Solving, the problems and solutions identified during the third level provide discussion points in a whole group setting. This level embodies collaboration, analysis, and problem-solving while discussing the struggles and successes encountered during the previous level. It provides peer-to-peer interaction and exchanges to identify students as experts at inquiry-based processes.

The final level of the EMSCI Model is Independent Activities. The teacher provides independent technological activities for each student to practice the strategies and skills learned during their participation in the EMSCI Model. This level provides time for the teacher to observe if all students can independently use technology or if some iteration of one or more levels of the EMSCI Model would provide additional practice for some students.

Teacher's knowledge about technology, comfort with technology, and perception of how to use technology as an instructional tool in classrooms provides an impetus of opportunities for student learning in a classroom. The EMSCI Model provides a new role for teachers as they gradually release responsibility of technology to students. The EMSCI Model offers a process to offset the generation gap between students and teachers by allowing and encouraging students to use technology independently.

Offsetting the Generation Gap

Constructivist teaching provides a necessary link teachers can use to counterbalance the generation gap in a classroom. Twenty-first-century learners expect to construct their knowledge using technology in a classroom. Constructivist teachers provide opportunities for students to participate in meaningful learning experiences which actively engage students in using technology to construct their knowledge. Student-centered classrooms focused on using technology in authentic ways create appropriate classroom environments for 21st-century learners. Forcing a pedagogical paradigm shift for teachers assists teachers in reshaping the way they teach which also reshapes the way students think and learn in classrooms. Therefore, a paradigm shift focused on constructivist teaching methods and technology use would provide a counterbalance for the generation gap between students and teachers.

Effective integration of technology must utilize research-based instructional methods which are known to enrich the learning process for students. Four key components of constructivist teaching which support and complement technology use in classrooms are: group participation, active engagement, connection to real-world experiences and frequent interaction including feedback. (Becker, 2000; Edutopia, 2008; ISTE, 2010).

Teachers using constructivist teaching methods have student-centered classrooms reflective of the needs of 21st-century learners. These classes provide learning experiences which are active, inquisitive, exploratory, collaborative and able to represent knowledge in authentic ways. Incorporating technology into the social environment of a classroom offers opportunities for students to construct knowledge through social interaction and play using technology (Berk & Winsler, 1995; Branscombe, et.al., 2003; Jacobs, 2010; Nanjappa & Grant, 2003; Piaget, 1954; Rakes, Flowers, Casey, & Santana, 1999; Vygotsky, 1986).

Teachers need to be certain that technology is reflected in their classroom environments because "...today's education system faces irrelevance unless we bridge the gap between how students live and how they learn" (Grabe & Grabe, 2007, p. 19). A student-centered classroom including technology would not only generate students' understanding of concepts but, iteratively generate new connections to real world events and experts. Use of technology in classrooms assists students in gaining skills needed to be productive citizens after graduation and support a shift in teachers' pedagogy (Gura & Percy, 2005; Grabe & Grabe, 2007).

Conclusion

In the 21st century, technology has become a pervasive presence for teachers and students in and out of the classroom causing a generation gap between the two cohorts in their expectations for using technology in classrooms. Teachers are encouraged in standards to engage students with technology to actively explore, participate in collaborative groups, interact with others and make connections to real world experiences. Additionally, teachers are encouraged to embrace and embed technology as another instructional method in classrooms so students can learn to use technology independently to construct knowledge. The EMSCI Model offers a process for both students and teachers to work towards independent use of technology in a collaborative manner. Changes brought about by teachers reimagining their classrooms and reshaping their pedagogy will fade the shadows of a generation gap due to the shining success of teachers and students independently using technology in classrooms.

References

- Association for Childhood Education International (ACEI). (2007). *2007 ACEI/NCATE Elementary Education Standards and Supporting Explanation*, Retrieved on July 18, 2010, from <http://acei.org/wp-content/uploads/ACEIElementaryStandardsSupportingExplanation.5.07.pdf>
- Asselin, M. (2001). Literacy and technology. *Teacher Librarian*, 28(3), 49-51.
- Balajhy, E. (2000). Issues in technology: The effects of teacher purpose on achievement gains. *Reading & Writing Quarterly*, 16, 289-294.
- Becker, H.J. (2000). Who's wired and who's not: Children's access to and use of computer technology. *The Future of Children: Children and Computer Technology*, 10(2), 44-75.
- Berk, L.E., & Winsler, A. (1995). *Scaffolding children's learning: Vygotsky and early childhood education*. Washington, DC: National Association for the Education for Young Children.
- Branscombe, N.A., K. Castle, A.G. Dorsey, E. Surbeck, & J.B. Taylor. (2003). *Early childhood curriculum: A constructivist perspective*. New York, NY: Houghton Mifflin.
- Burns, M. (2005-06). Tools for the Mind, *Educational Leadership*, 63(4), 48-53.
- Buzhardt, J., & Heitzman-Powell, L.S. (2005). Stop blaming the teachers: The role of usability testing in bridging the gap between educators and technology. *Electronic Journal for the Integration of Technology in Education*, 4, 13-29.
- Calvert, S., Rideout, V., Woolard, J., Barr, R., & Strouse, G. (2005). Age, ethnicity, and

socioeconomic patterns in early computer use: A national survey. *American Behavioral Scientist*, 48, 590–607.

Chiong, C., & Shuler, C. (2010). *Learning: Is there an app for that? Investigations of young children's usage and learning with mobile devices and apps*. New York: The Joan Ganz Cooney Center at Sesame Workshop.

Christensen, C.M., Horn, M.B., & Johnson, C.W. 2008. *Disrupting class: How disruptive innovation will change the way the world learns*. New York, NY: McGraw Hill.

Clements, D.H. (1999). American Association for the Advancement of Science Dialogue on Early Childhood Science, Mathematics, and Technology Education: *First experiences in science, mathematics, and technology--Young children and technology*. Retrieved on September 18, 2005 from

<http://www.project2061.org/publications/earlychild/online/experience/clements.htm>

Coley, R., Cradler, J., & Engel, P.K. (1997). *Computers and classrooms: The status of technology in US schools*. ERIC Documents # ED412893. Retrieved March 13, 2009, from

http://eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_ERICExtSearch_SearchValue_0=ED412893&ERICExtSearch_SearchType_0=no&accno=ED412893

DeBell, M., & Chapman, C. (2003). Education Statistics Quarterly. *Computer and internet use by children and adolescents in 2001*. Retrieved on September 18, 2005, from

http://nces.ed.gov/programs/quarterly/vol_5/5_4/2_1.asp

Edutopia Staff (2008). Why integrate technology into the curriculum? The reasons are many.

Edutopia: Technology Integration, Retrieved January 5, 2009, from

<http://www.edutopia.org/technology-integration-introduction>

Escobar, M., & Cappella, E. (2000). What children think about computers. *The*

Future of Children: Children and Computer Technology, 10(2),186-192.

Fryer, W. (2003). Campus technology leaders. TechEdge, Retrieved on July 18, 2010 from

<http://www.tcea.org/Publications/TechEdgeArchives.asp#Summer2003>

Grabe, M. & Grabe, C. (2007). *Integrating technology for meaningful learning*. New York,

NY: Houghton Mifflin.

Gura, M. & Percy, B. (2005). *Recapturing technology for education: Keeping tomorrow*

in today's classrooms. New York: Rowman & Littlefield Education, Inc.

Gutnick, A. L., Robb, M., Takeuchi, L., & Kotler, J. (2011). *Always connected: The new digital*

media habits of young children. New York: The Joan Ganz Cooney Center at Sesame

Workshop.

Hyun, E. (2005). A study of 5- to 6-year-old children's peer dynamics and dialectical learning

in a computer-based technology-rich classroom environment. *Computers and Education*,

44, 69-91.

Ihmeideh, F. (2010). The Role of Computer Technology in Teaching Reading and

Writing: Preschool Teachers' Beliefs and Practices, *Journal of Research in*

Childhood Education, 24, 60-79.

International Society for Technology in Education (ISTE). (2010). *Standards for Global*

Learning In The Digital Age. Retrieved on July 18, 2010, from

<http://www.iste.org/standards.aspx>

Jacobs, H.H. (2010). *Curriculum 21: Essential Education for a Changing World*.

Alexandria, VA: ASCD.

Lisenbee, P.S. (2009). Influences on young children's behavior, engagement level and representation during storytelling using an interactive whiteboard. Dissertation Abstracts International. (UMI No. 3358965).

Murphy, K.L., DePasquaie, R. & McNamara, E. (2003). Meaningful Connections: Using Technology in Primary Classrooms, *Young Children*, p. 12-18.

National Association for the Education of Young Children (NAEYC). (January, 2012). *Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8* (A joint position statement of the National Association for the Education of Young Children and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent Collegen). Washington, DC: NAEYC.

Nanjappa, A., & Grant, M.M. (2003). Constructing on constructivism: The role of technology. *Electronic Journal for the Integration of Technology in Education*, 2(1), p. 38-55. Retrieved March 12, 2007, from <http://ejite.isu.edu/Volume2No1/nanjappa.htm>

Piaget, J. (1954). *The construction of reality in the child*. New York: Basic Books.

Prensky, M. (2005). *Adopt and adapt: Shaping tech for the classroom*. Retrieved October 15, 2007, from <http://www.edutopia.org/node/1423/print>

Prensky, M. (2005-06). Listen to the natives. *Educational Leadership*, 63(4), 8-13.

Prensky, M. (2008). The role of technology in teaching and the classroom. *Educational Technology*, (Nov/Dec), 1-3.

Rakes, G.C., Flowers, B.F., Casey, H.B., & Santana, R. (1999). An analysis of instructional technology use and constructivist behaviors in K-12 teachers. *International Journal of Educational Technology*, 1(2), 1-17.

Shields, M.K., & Behrman, R.E. (2000). Children and computer technology: Analysis and recommendations. *The Future Of Children: Children And Computer Technology*, 10(2), 4-30.

United States Department of Education (2004). *Toward a new golden age in American education: How the internet, the law and today's students are revolutionizing expectations*. Retrieved March 13, 2009, from <http://www.ed.gov/about/offices/list/os/technology/plan/2004/plan.pdf>

Vygotsky, L.S. (1986). *Thought and language*. Cambridge, MA: Massachusetts Institute of Technology Press.

Wilhelm, J.D. (2004). Inquiring minds use technology! *Voices From The Middle* 11 (3) 45-46.

Mexican-American Transnational Junior/High School Students: Crossing Borders through New Media Literacies

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Abstract

A few literacy researchers have called for an examination of the kinds of literacy practices of transnational youths because such individuals have family members and different social relations in multiple countries and use literacy to maintain their relationships. Some scholars suggest a need for schools and teachers to embrace and build upon students' language, transnational, and media literacies. This research reports on a mixed method study on the use of language and new media literacies in a sample of Mexican-American transnational students living on a US-Mexican border. Data for the study were collected from 103 junior and high school students in Southern California, using a four-point Likert-type attitudinal scale, interview, and printouts from electronic communications. The findings suggest that the transnational youth employ new media literacies to build and maintain multiple social affiliations, use translanguaging to cross linguistic borders; and traverse between genres and between media to establish their identity on a local and global level. However, the findings indicate the participants' out-of-school literacies may not have been integrated into literacy instruction. The findings indicate that teachers of transnational and mono-national youths need to affirm and support the diverse literacy practices that students bring from their homes and cultural communities and use such resources to empower them in academic settings.

Key words

New media literacies, translanguaging, transnationalism, literacy instruction

Research on literacy practices of Mexican-American transnational students suggests that they use new media literacies to traverse borders and become literate in both Spanish and English with new media (Sánchez & Salazar, 2012; Skerrett, 2012). New media literacies are the literacy practices associated with the Internet, social network media, websites, video games, and mobile devices that provide youths the ability to create, interpret, and manipulate all new media forms (New Media Consortium, 2005). Transnational students physically cross boundaries and use new media to stay within borders. Because Mexican-American youths function across multiple interactional contexts including the U.S., Mexico, classrooms, and social network sites, their literacy practices are highly situated and diverse. As a result, research indicates that teachers of Mexican-American transnational students can facilitate learning by drawing upon the youths' language, transnational, and new media literacies in ways that are both affirming and supportive for learning (de la Piedra, 2010; Jiménez, Smith & Teague, 2009; Sánchez & Kasun, 2012).

Indeed, researchers (e.g., de la Piedra & Araujo, 2012; Stockdill & Moje, 2013) have argued that rather than the deficit models of Mexican-American youths as unmotivated and disengaged from learning, schools and teachers should think of how to integrate their students' transnational and new media literacy practices into instruction. Transnational literacies is defined as the diverse literacy practices that migrants develop and enact to communicate and interact across local-global communities, multiple languages, media, and varied cultural locations (Hornberger 2012; Warriner, 2007). From this sociocultural perspective, transnational literacies are social and ideological ways of language use, self-expression, and meaning-making in diverse social and cultural worlds (Hull & Stornaiuolo, 2013).

A crucial advantage of integration of transnational literacy into instruction is that it will allow teachers to develop a greater understanding of “the life worlds of their students and to build more meaningful relations with them” (Jiménez et al, 2009, p. 16). The approach means that literacy teachers must understand the connections they can make between pedagogy and outside school literacies that motivate and engage Mexican-American transnational students such as texts, topics, discourses, and new media and how to capitalize on the resources to inform school curricula, materials, and pedagogy (Hull & Stornaiuolo, 2013; Stockdill & Moje, 2013). Hence, the metaphor of border crossing is used here to conceptualize Mexican-American transnational students’ literacies as fluid, relational, and situated within and between locality/globality, languages, genre, and media.

However, studies on the issues of movements of people and new media in creating opportunities for students’ learning suggest that “mobilities and their relations to learning within education are still understudied and undertheorized” (Leander, Phillips & Taylor, 2010, p. 329). Indeed, the relations of space and learning may not have been adequately theorized, as most existing literacy learning theories tend to offer little explanation on how students’ experiences across spaces, places, and times are resources for learning. Hence, there are limited theoretical perspectives on learning resources that youths access as they traverse multiple borders. There are also insufficient theoretical models of learning that account for how transnational youth capitalize on their language and new media literacies for learning (Gutiérrez, 2008). Leander et al (2010) use the term *geographies of learning* as a conceptual framework to address issues of place, space, and learning trajectories, and to ask how social systems such as people and resources for learning are configured across time and space to provide opportunities for learning.

Drawing on the theoretical perspectives of Domingo (2012), Lam and Warriner (2012), Leander et al (2010), and Gutiérrez, Bien, Seland and Pierce (2011), I investigate how Mexican-American transnational students use new media to traverse borders and examine whether their literacy practices are employed to create opportunities for learning. The following research questions guided the study:

- In what ways do Mexican-American transnational students use new media literacies to cross national and linguistic borders?
- What are the Mexican-American transnational students' attitudes toward literacy instruction in their schools?

This study is an important contribution to in/outside school literacies of Mexican-American transnational students from multiple perspectives around new media literacies. Students' outside school literacies are multiplex, substantive, and highly significant and have important links to and implications for their cognitive work and academic literacy. For many students, the traditional language-based, pencil-and-paper-bound English Language Arts (ELA) is not culturally relevant as they consequently reject schooling as a form of resistance (Valenzuela, 1999). If schools intend to prepare functionally literate students — who come to school with enthusiasm and literacies that they view as functional in their lives — teachers need to understand how learners use new media in their everyday lives (Schultz & Hull, 2008). ELA teachers must also use youths' knowledge of new media to empower them to be both critical thinkers and creative consumers/producers of multimedia texts. Youths need the knowledge to participate in semiotic economy where knowledges are produced and consumed as discourses, new genres, and digital texts (Fairclough, 2002). Furthermore, unlike most existing studies, this research surveys a large number of Mexican-American transnational youths in a single literacy study. As Mexican-American youths are the

fastest growing ethnic group in the U.S. they represent a new, moving frontier in literacy and economy, and hence, warrants a thorough investigation of their transnational and media literacies. Finally, this study corroborates existing research about how new media literacies assist transnational youths in maintain transnational identities, social affiliations and networks, and literacy and language practices.

New Media and Youths' Literacy Practices: A Theory

What counts as youths' literacy is shifting due to the change in the relationship between existing new media technologies, markets, genres and audiences (Jenkins 2006). Scholars of adolescent literacies, including Donna Alvermann, Julie Coiro, and Kevin Leander, among others, have provided valuable insights into media literacies of both monolingual and multilingual youths. They theorize adolescents' literacies in terms of everyday social practices involving the use of new media and ways of thinking about and doing literacy in the 21st century.

Today's youths use new media to acquire literacy practices in relations to the dominant ideology, influence, and power in the broader society and to push back against the dominant print-based, unimodal definitions of literacy that structure their everyday lives (Ito et al, 2008). For example, schools often consider youths' literacies threatening to the school-sanctioned literacy and are reluctant to recognize the educational values of outside school literacies that have potential for transfer to school literacy. Indeed, youths' literacy practices have expanded from reading and writing to include how they use new media to produce innovative and varied literacies (Jenkins, 2006), create and interpret text meanings to reflect their identities (Moje & van Helden, 2005); remix to create hybridized texts to suit audiences and purposes (Ito et al, 2008); use new media to forge transnational affiliations (Lam, 2009); and bridge the gap between out/in-school literacies (Livingstone, 2008; Yardi, 2008).

Youths' knowledge of new media literacies calls into question the deficit lenses with which schools view their literacies and the traditional print-based literacy approaches for literacy instruction. For most Mexican-American transnational students, border-crossing experiences constitute the funds of knowledge they bring to their communities within school and outside of school contexts (Sánchez, 2007). For example, transnational youths employ translanguaging as a discursive practice to access two languages and maximize communicative potential as they traverse across multiple nations (Garcia, 2009). Mignolo (2000) argued that languaging is "thinking and writing between languages" and "speech and writing are strategies for orienting and manipulating social domains of interaction" (p. 226). Translanguaging allows transnational youths to flexibly use linguistic resources from multiple languages in the process of becoming themselves and of their language practices as they interact and make meaning in the world (Garcia & Wei, 2014). Therefore, the value for how transnational youths engage with and think about language and literacy practices provides a compelling argument for ELA teachers to think of how they can build upon their students' outside school literacies to enhance motivation, engagement, and learning (Author, 2015).

Transnationalism and Social Networking

Transnationalism refers to the processes by which immigrants forge multiple social relations that link together their native countries and the nations where they reside (Glick Schiller, Basch and Szanton Blanc, 1995). While transnational immigrants usually settle and become embedded in the social structure of host nations, they are simultaneously connected with their native countries. For example, Mexican-origin individuals in Chicago used translanguaging to bring people together via the shared valuing of linguistic resources (Farr, 2006). Such Mexican-American bilinguals

creatively draw upon Spanish and English for communication and socialization depending on the contexts, purposes, and audiences (Bailey & Orellana, 2015).

Before the rise of new media in the early 2000s, old media enabled migrants to communicate globally. Immigrants used international telephone and camera to reinforce ties with families at home (Smith, 2006). However, new media are more efficient in helping youths stay connected to their home countries. The Pew Hispanic Center (2013) states that foreign-born Latinos make up 46% of all Latino social networking site users and that 55% of them say that they mostly or only use Spanish when posting Facebook updates or tweets.

Transnational New Media Literacies: A Review of Related Studies

In this section, I review relevant studies for the important implications they have for the design, conduct, analysis, and interpretation of data in the current study. A relevant literature review contributes to the design and provides important argument that explains and justifies a new study (Maxwell, 2006). Researchers of transnationalism have examined new media literacies, global-local connections, and new media that sustained transnational networks. Lam (2009) explored how one adolescent girl from China used digital media to create networks and noted that the student employed new media to develop affiliations with different communities within the U.S. and China. Yi (2009) studied the literacy of two Korean transnational adolescents and suggested that they used multiple literacies to forge transnational identities through online interactions. McLean (2010) examined how a student used digital literacies to support her Trinidad-Tobago-Caribbean heritage and urged teachers to embrace the global-local dimensions of funds of knowledge that immigrants use for transnationalism. The findings in these studies raise new questions about the new media literacies of Mexican-American transnational youths such as: why is knowing about how the youths use new media to stay connected across borders matters to how teachers teach

ELA? In addition, there is a need to build on the findings by using a mixed methods that allows for an analytic approach involving triangulation of multiple data sources and multiple types of analysis to provide a more comprehensive understanding of the research questions than the previous mono-method studies (Hull & Stornaiuolo, 2014; Maxwell, 2006).

Other researchers have explored how students become multiliterate in transnational contexts. In an ethnographic study of three Latino immigrants, Sánchez and Salazar (2012) suggested that the students used computers to develop related linguistic repertoires for translating English to Spanish. de la Piedra and Araujo (2012) explored how Mexican-American transnational students in Texas border use *transfronterizo* (cross-border) vernacular and English in school. The study collected data through classroom observations, tape-recorded interactions, and artifacts and concluded that the students use *transfronterizo* to “establish an identity as members of their transnational families” (p. 582). However, there is a need for more studies that collect data from students regarding their views about school literacy practices and provide analysis that can offer a more complete understanding of the school structures and practices that facilitate or hinder conversion of students’ cultural capital into legitimate learning resources.

Skerrett (2012) explored how an English teacher of a Mexican-American student fostered and created the use of multiple languages and transnational understandings in school writing assignments. The findings showed that the student used the opportunities created by the teacher to bring her outside school life, languages, and literacies into school. The findings suggest a need for large sample size studies so that researchers can ask new questions, develop new hypotheses, or generate new theories about new media literacies of transnational youths (Maxwell, 2006).

Collectively, the literature review helps me to build on how transnational students draw on new media literacies for border crossing. Using mixed methods approach in this study allows me

to provide a more comprehensive study of the research problems than either qualitative or quantitative approach alone. The approach allows me to (a) triangulate the findings from students' interview and new media data with survey data and (b) offer pertinent answers to the research questions (Johnson et al, 2007).

The Border Context of the Study

Many people in the county (site of the study) tend not to migrate permanently to the U.S.; instead, they cross the border on a daily basis because they live on one side and have jobs and/or families on the other. The 2013 U.S. Census data show that 81.8% and 12.8% of the people were Latino or White, respectively. Also, 32.3% of the residents were foreign born while 74.5% speak a language other than English at home. Per capital income in the county in 2013 was \$16,763 (as against state average of \$29,527). Also, 32.3% of the people live below the poverty level.

There is an overwhelming presence of Mexican culture. Residents have roots in both the U.S. and Mexico. Billboards are in Spanish or blends of English and Spanish. Popular Mexican musical ensembles such as *mariachis* and *tamboras* play different genres including *corridos*, *cumbias*, and *rancheras* at public ceremonies.

Method

The qualitative dominant mixed methods approach is used for this study. The approach allows researchers to collect qualitative data while simultaneously add quantitative information for the purposes of depth and breadth of understanding (Denzin, 2010; Johnson, Onwuegbuzie, & Turner, 2007). The approach does not only allow me to simultaneously address the broad range of questions associated with the students' media and textual practices, it also provides the opportunity to give divergent conclusions and inferences due to the complexity of the data sources and analyses (Teddie & Tashakkori, 2010). The method further affords the opportunity for a cyclical approach

which allows me to move back and forth between the five qualitative categories in the survey and the five themes in the data analysis in a way that the research design influences data collection and the data collected is used to refine data analysis. The cyclical approach allows me to provide a structured survey and theoretically derived recruitment of study participants (Teddie & Tashakkori, 2010).

As a language and literacy professor in a university in the Southern California/Mexico border, I have observed the globalization of communicative practices of youths resulting from the exchanges of people, cultures, languages, and texts in the U.S.-Mexico border. As I work with teachers in the community and learn to speak Spanish, I am intrigued by the youths' literacy practices: the tendency to use new media to re-territorialize communication by shifting among English, Spanish, and translanguaging, depending on whether they are speaking with a friend in the U.S. or Mexico. This study allows me to investigate how the students use new media to construct networks across U.S.-Mexico border. Also, youths' transnational literacy practices in the community have forced me to rethink whether the school values and supports students' transnationalism and translanguaging to enhance motivation, engagement, and learning. I think of the consequences if schools do not build on students' resources for learning: opportunities for learning are lost and work and life futures are potentially constrained.

Participants

The county had a total of eight junior and high schools. The demographic data of the schools showed student populations were similar as Mexican-American students ranged from 89% to 96%. Letters were sent to school principals to seek permission for the study. Four principals agreed to participate while four declined because students were preparing for the California High School Exit Examination (CAHSEE). The students were drawn from two junior high schools and two high

schools. The four principals distributed the information about the study to ELA teachers. The conditions for participation in the study were that: teachers would (a) distribute permission forms to parents, (b) provide time in class to administer the survey and interviews, and (c) sign a consent form. A teacher from each school volunteered and were given the consent forms to distribute to their students for their parents or guardians' signatures.

Each teacher selected one of his/her classes to participate in the study. The classes were made up of Mexican-American students like other classes that did not participate in the study. The teachers and I used four criteria to select the classes: students must (a) be of Mexican origin, (b) have social network accounts, (c) be willing to complete the survey, and (d) be ready to participate in a follow-up interview. The school-based study allowed the survey and interview questions to be administered to a class of students at once and collected the same day.

In all, 103 students from four junior/high schools participated in the study. The schools were coded A, B (high schools) and C and D (junior high schools) for anonymity. Thirty (29.13%) participants came from school A, 25 (24.27%) from school B, 28 (27.18%) from school C, and 20 (19.42%) from school D. The students' age ranged from 13 to 18, 53 (54.08%) females, and 45 (45.92%) males. Also, 10% and 68% identified themselves as "first-" and "second-generation" Mexican-American (Levitt, 2009) while 22% indicated they were recent immigrants. While first-generation refers to individuals who were foreign-born even though they might now be U.S. citizens and live in the country, second-generation means individuals who were born in the U.S. with at least one first-generation parent (Levitt, 2009).

Seventy-seven percent of the students came from the Baja California Peninsula region and speak Northern Mexican Spanish, while 23% came from mainland Mexico and speak other varieties of Mexican Spanish. Also, 93% indicated they speak Spanglish (a hybrid of English and

Spanish's words and expressions). Moreover, 71% of them were classified as English language learners and 29% as English proficient. The students live along the U.S.-border towns which simultaneously provide them experiences of life in the U.S. and experiences of events that connect them to Mexico. Many of the students live in California on weekdays but spend their weekends and holidays in Mexico. The students are geographically located in both the U.S. and Mexico and their experiences traverse the two nations.

The students live in neighborhoods in California where Spanish is mainly spoken, and thus have fewer opportunities to interact with English speakers. They often display cultural representations of Mexico through their preferences for clothing, music, and language. Living in-between two cultures, two languages, and two nations, the students use literacy practices characterized by heterogeneity and border-crossing dynamics by switching between English and Spanish and between Mexican and American cultures (Kostogriz, & Tsolidis, 2008). Living in-between languages means that the students may face increased challenges in learning English. The data from the CAHSEE show that only 31% of ELLs pass the ELA in grade 10. Moreover, 98% of the students stated that they participated in the federal-government subsidized lunch program which suggested the learners came from families of lower socioeconomic backgrounds.

Data Collection Procedures

Data for this study were collected between September and December 2011 and consisted of a survey, open-ended questions, and samples of the students' electronic communications. Because of the language characteristics of the schools, Spanish and English versions of the survey were administered (see Note A & B¹). While both versions were distributed, the teachers directed the students to respond in English. The school discourses of English-only (e.g., emphasis on English language and literacy development) in junior/middle schools in California might have influenced

the teachers and most students' preference to respond to the English version. In all, 115 surveys were distributed but only 103 students returned completed copies, representing 89.56% response rate of the total pool. Five students responded to the Spanish version while 12 students (11%) did not complete the survey as they did not respond to several items, perhaps due to the fact that they are Spanish dominant. The teachers provided translation for students to mitigate the impact of the directive that learners fill out the English version of the survey.

The survey is guided by a theoretical framework which suggests that new media (a) reshape literacy practices and (b) allow for reading across media and genres (Domingo 2012; Sánchez & Kasun, 2012; Leander et al, 2006). The survey consisted of 73 statements. In Section A (items 1–13) the students answered questions about biographical data. In sections B, C, D, E and F, a four-point Likert attitudinal scale was used to collect data. In section B (items 14–22) the students responded to statements about the frequency of using new media (“Frequently” means 5–6 times a day; “occasional” equals 2–3 times a week; “rarely” means 1–2 times a week; and “never” means less than one time a week). In Section C (items 23–30), the students responded to questions about their language use. In Section D (items 31– 42) the students answered questions on the types of texts they read/write. In Section E (items 43– 52) they indicated how much they agreed or disagreed with the statements about what they use new media for. In Section F (items 53–73) students responded to statements about literacy instruction. Finally, the students who had more to say did so in the informational box at the end of each section. (For the survey and interview questions, see Appendixes B, C, & D at

<https://www.dropbox.com/s/49arsyvnazwtawp/MexicanAmerican%20Transnational%20APPENDICES.doc?oref=e&n=315543918>).

Likert-type attitudinal scale for data collection allowed me to cover a broad range of data with which to explore the different literacies that youth mobilize to cross border. However, the method had some limitations; each statement offered only a few options with which the students might not fully agree. The open-ended interview questions were used to address the problem.

Eighteen students who completed the survey responded to face-to-face, one-on-one, audio-recorded, and open-ended interview questions. They were selected based on their availability for a follow-up interview and willingness to provide samples of electronic communications. Ten (55.56%) participants were drawn from high schools while eight (44.44%) were drawn from junior high schools. There were 9 (50%) female and 9 (50%) male students. Also, 15 (83.33%) identified themselves as first- and second generation Mexican-American, and three (16.67%) said they were recent immigrants. The students were similar to the overall group.

The interviews took place during lunchtime in the students' classrooms with the assistance of the class teachers. The interviews were conducted the following day after the students filled out the survey. Altogether, 18 interviews were conducted and each lasted approximately 30 minutes. The interviews were mainly in English; however, a bilingual teacher translated the interviews for one student. The interviews were later transcribed. The limited knowledge of English by some students did not make a difference in their responses to the survey because the answers of those who completed the questionnaire in Spanish were similar to those who responded in English. This might be due to (a) the students having learned the terms used in the survey when they hung out with friends in chat rooms and had face-to-face conversations, and (b) many of new media terms had English-Spanish cognates, including chatroom (*sala de chat*), website (*sitio web*), text message (*mensaje de texto*), and cell phone (*teléfono móvil*) that allowed students to figure out the meanings of words on their own (see

Appendix 2 for the interview questions)

The open-ended interview questions allowed the students to explain the significance of and motivation for using new media to cross borders. The students submitted samples of their 15 most recent (the last two weeks) electronic communications (texting, email, Facebook messages). To print the messages, the students logged into the “Contacts” on their cell phones and created a new contact with their names and e-mail addresses. Then a message was selected for printing. The students clicked “Forward” to send the message to their e-mail addresses. The message then appeared in the students’ email inbox. The students opened their email accounts in the computer lab, deleted their names and addresses, and selected the “print” option to print the message. My research assistant (a Mexican-American, high school bilingual teacher) translated the Spanish aspects of the messages into English. The printouts were examined to provide deeper understanding of how the students used new media for communication across multiple contexts.

Content Validation of the Instrument

We subjected the interview and survey responses to reliability and validity analyses. For content validity, a class in one middle school (not part of the main study) in the county responded to the two versions of the survey and interview questions during a pilot study. The same survey was re-administered to the same class one week later. A test-retest reliability was conducted and scores from both tests were correlated. The obtained correlation coefficient ($r = 0.9$ and 0.8) indicated the scores were stable over time. Pilot testing is used to establish the content validity of a survey and improve the questions, format, and scales (Creswell, 2009). For sampling validity, the survey and interview questions were given to two literacy professors to assess their relevancy and coverage of the broad range of areas within new media literacies. The use of expert panel ensured that the survey was grounded in literature and that the topic was adequately sampled

(Creswell, 2009). The professors' suggestions were used to revise and refine the survey.

To conduct a factor analysis, Kaiser's (1974) recommendation of Eigenvalues over 1 and Scree plot were used. The factor analysis yielded five factors with Eigenvalues greater than 1, which indicated that a five factor solution was used for the study. Because the factors were not likely to be related, direct oblimin rotation was used. Only questionnaire items with loadings of 0.40 or higher on a factor were accepted based on the assumptions of factorability from Bartlett's test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy. A five-factor solution was used by examining (a) factor loadings greater than 0.40, (b) Eigenvalues greater than 1.0, and (c) the scree plot of Eigenvalues (see Appendix A). Internal reliability for each of the factors was examined using Cronbach's alpha. The reliability coefficients in Table 1 show high internal reliability within each cluster of items: frequency of using new media .92; language use for communication .91; types of texts read/written .92; social media .90; and literacy instruction .94. The survey was revised and the final version was used for the main study.

Table 1: Factor Loadings

Factor	Item loadings	Number of items	Cronbach's alpha	% common variance
Frequency of using new media	.42-.86	9	.92	56.54
Language use for communication	.40-.88	8	.91	52.62
Types of texts read/written	.57-.87	12	.92	55.88
Social media for literacy practices	.40-.86	10	.90	51.82
Literacy instruction	.42-.86	21	.94	58.48

Data Analysis

The qualitative procedures of inductive and interpretative coding, cross-comparison of codes, and triangulation across data (Corbin & Strauss, 2008) were adopted for data analysis. Coding involves construction of categories that capture important features of data (Merriam, 1998). For initial coding, both the interview and social media data were read many times word-by-word to identify key ideas that were pertinent to the research questions. To track the type of new media used by the participants, I developed the following categories: (a) new media (e.g., texting, Facebook), (b) literacy function (e.g., critiquing), (c) languages (e.g., English, Spanish), and (d) spatial-temporal distance (e.g., local, global).

I looked for themes that were relevant to the research questions across the qualitative data. The students' self-identified text showed that they read within and across genres and integrated diverse media. I tabulated and organized the texts into genres and provided a summary of the content of each category: Spanish-based texts (e.g., Latino cultures, histories), magazines (e.g., teen culture, lifestyles), and literary books (e.g., romance, fantasy). To code the qualitative data, I focused on critical interpretation of how the students use new media to construct or critique messages. A student wrote on his Facebook wall: "I feel bad for kids as they are suffering in Egypt because of the dictator government. It is better if the government stop corruption and give young people job. I like that young people come together to fight to have a voice in their society." The message was coded as "critical awareness of global issues." Another student wrote: "I like to read from different genres and media so that I can learn information from many sources." The student's message was classified as "crossing genres and new media." Using the qualitative coding procedures, all parts of the data were assigned labels that simultaneously summarized, categorized, and accounted for each segment (Charmaz, 2006).

The constant comparison method (Corbin & Strauss, 2008) was used to establish analytic distinctions by comparing data from one student with data from another, messages from Facebook walls to interviews, and differences and similarities between different interviews. The coded analytic categories within and across the data were grouped conceptually into five categories in relation to the research questions: new media, multiple world communities, translanguaging, genres, and out/in school literacies. Based on the cyclical nature of the study, I made links between the research design (e.g., five qualitative categories/factors in the survey and the five qualitative themes of the interview questions) and data analysis (e.g. the five themes in data analysis section). Hence, there are similarities between the five quantitative categories in the survey and the five qualitative themes in the data analysis. The convergence of the themes was planned at the beginning as part of the MMA approach which allowed me to analyze diverse data simultaneously and merge them for an in-depth analysis (Creswell, 2009).

The quantitative data were analyzed using SPSSPC + statistical software for descriptive statistics and reliability analysis. Descriptive statistics allowed for data summary in numerical form such as mean, median, mode.

Findings and Discussion

The research objectives of this study are to find out how the Mexican-American transnational students use new media literacies to cross borders and examine whether their transnational literacy practices are integrated into literacy instruction. The students that are quoted in the qualitative data are assigned pseudonyms to protect their identities and ensure that the data on the participants can be tracked back to their sources. This section presents the findings.

New Media

Data from the survey, interviews and samples of electronic communications showed that the students employed new media literacies to build networks and affiliations in Mexico and U.S. Table 1 showed that the students expressed high frequency rates of using new media literacies with mean scores ranging from 3.01 to 3.62 on a four point Likert scale. The students expressed a high frequency rate with regard to the statements that they talked on cell phones with family members in Mexico with a mean of 3.62; sent e-mail to people in U.S. with a mean of 3.10; surfed websites with a mean of 3.25; blogged for people to read their ideas with a mean of 3.32; and shared experiences in the U.S. with friends in Mexico with a mean of 3.35.

Table 2: The Participants' Literacy Practices (N = 103)

Items: What I do after school	Mean	Median	Std. statistics
14. I watch news on my cell phone	3.42	3.00	.87
15. I blog for people to read.	3.32	3.00	.94
16. Talk on cell phone.	3.62	3.00	.82
17. I read/sent text message to people.	3.49	3.00	.86
18. I surf the web	3.32	3.00	.82
19. I sent e-mail to people to people.	3.10	3.00	.65
20. I sent instant messages	3.35	3.00	.94
21. I surf the websites to read	3.25	2.00	.91
22. I post messages on social network sites	3.41	4.00	.70

The students used new media to share their interests locally and globally. Samples of the students' electronic communications suggested that new media afforded them opportunities to use transnational literacies and translanguaging for border crossing. For example, Mario talked about

his admiration for a sleek car with a friend in Mexico on his Facebook page: “The thing that *yo admiro* [I admire] is a car Mustang Leonora 76s. *Yo* [I] admire that car because Mustang Leonora is [a] very powerful car and is very fast. I like the car because [it] has 850hp V8, *doble arbol de leva* [double overhead camshaft and cross-flow cylinder head] and one vtec. The car no *gasta* [doesn’t waste] too much gasoline *aunque sea* [even though it has a] v8.”

The Internet allows transnational youths in different nations to interact on a person-to-person basis. Maria fondly wrote about her grandfather to her friend in Mexico in an e-mail: “Sergio — is the best grandpa in the planet. He is a nice person, respectful, hardworking, and responsible. All this [these] values its [are] so hard to found [find] in a man in the world. *El es un hombre muy respetuoso* [He is a very respectable man] because *cuando yo tengo una opinión sobre cualquier punto de vista* [when I have an opinion with a different point of view] he respects my opinion.”

New media provide youths the space for expressing their views on family and community issues. Claudia discussed her love, admiration, and respect for her mother on her Facebook page: “My mom is everything to me she is the best person in my life because she is good with me I don’t get in trouble a lot only when I do things really bad. She make[s] Mexican food such as *tortillas*, *champurrado*, *enchiladas*, *tostadas* and *sopes* really good the best one in the world. I will never be bad with her *o faltarle el respeto porque la quiero mucho* [or disrespect her because I love her very much] that’s why *yo nunca lo haría*” [I would never do it].

The students used new media resources to develop social conscience — an important step in navigating the complex American society. The students used new media to develop social awareness, showed concerns for the problems in the society, and made conscious choices about how to shape their communities according to their values. During an interview, Jorge stated: “I

feel free to talk about any issues without the fear of intimidation.” Adriana added her voice to the political debate regarding the DREAM Actⁱⁱ bill by stating in an interview: “I think all people should come out and support the DREAM Act bill. It is a good thing [policy] because it will allow young people to apply for help for tuition and go to community colleges and state universities and contribute to this country.” The data showed that the students discussed diverse social issues including an immigration reform bill in the U.S. Senate, support for same-sex marriage, deportation of undocumented immigrants, and the DREAM Act bill.

Discussion. Data analysis around new media indicates that the students use the technology to build transnational social networks and discuss social issues that are of interest to them. The finding suggests that new media and the associated literacies are crucial tools in the trajectories of transnational youths. The availability of new media such as cell phones with Internet capabilities such as weblog, texting, e-mail, and web surfing ensures that the students maintain social affiliations across the U.S.-Mexico borders. This finding adds to previous work that suggests border-crossing is important as transnational students use new media to develop expansive and diverse relational social networks and transnational connections within the U.S. and across Mexico (see, for example, Domingo, 2012; Lam & Warriner, 2012).

Another important finding is that new media affords the participants opportunities to express their views on social issues. Currently, limited studies have examined how Mexican-American transnational students use new media to engage in literacies that increase their social awareness. The participants use new media to develop social consciousness by engaging in social dialogues that make them explicitly aware of and discuss factors that shape their experiences in the U.S. The independence and autonomy, creative expression, and an investigative approach afforded by new media might have provided a space for the students to increase their social

awareness. Indeed, today's youths are "more skeptical and analytical, more inclined toward critical thinking, and more likely to challenge and question established authorities than previous generations" (Buckingham, 2006, p. 7). If an important goal of literacy instruction is to prepare youths to be agents of positive change in the community, teachers need to build on and support students' outside school literacies for in-school literacy learning. New media literacies offer transnational students opportunities to explore local community issues and concerns, promote social and civic knowledge, and enhance personal knowledge of the world.

Multiple World Communities

The transnational youths took up sociopolitical conversations and perspectives through new media literacies. The students developed a sense of global citizenship and critical awareness of global issues as shown by their curiosity about international events. In Table 1, the students expressed high frequency rates about watching news on cell phones to know what is happening in the world with a mean score of 3.42; read and sent text messages about topical issues to people in other countries with a mean score of 3.49; sent instant messages to communicate with people in other countries with a mean score of 3.35; and post messages on social network media to communicate with people in the U.S. and other nations with a mean score of 3.41.

The students' postings and interview indicated that new media afforded them opportunities to act as transnationals who expressed their concerns about the plights of people around the world in social network sites. For example, 76 (73.78%) of the students expressed solidarity with youths that led the Arab Spring (the protests and uprisings that toppled some dictators in the Arab world beginning in 2010). Diane wrote in her Facebook: "I feel bad for children as they are suffering in Egypt because of the bad government. It is better if the government stops corruption and gives people work." Donna also wrote on Twitter: "I like that young people come together to fight to

have a voice in their society.” These comments indicated that the students view the youths in the Arab countries as agents of change — who want to use their voices and actions to create change and transform the society.

Eighty-two (79.61%) of the students showed a sense of understanding beyond the U.S. borders as they critiqued Arab countries for unequal economic opportunities and political status quo. In an interview, Jorge argued that: “The youths are doing the right thing. They are fighting to force the governments to end corruption and change the [political and economic] systems so that everybody can have equal opportunities and live a better life.” Esmeralda stated: “Young people are engines of change and they are trying to create a better tomorrow for themselves and others.” The comments suggest that the students recognize the struggle of their peers in foreign countries to alleviate human suffering and work to promote social justice and human dignity.

The students rose above local concerns and expressed sympathies and critical perspectives on social justice issues on their social network sites. The students questioned the wisdom of the war in Afghanistan and Iraq. Clemente wrote on Facebook: “The war is bad for young people in the countries. They are starving and dying from bombs. Nations cannot solve their problems through wars. People should come together to figure out how to solve problems.” Adriana, in the interview, argued: “I don’t like how innocent people are dying. I see pictures of people who are dying on the Internet daily and this makes me sick to my stomach. People in the world should find peaceful ways to solve problem [conflicts].” The comments indicated that the students sympathized with others and offered a vision of what “the world could be” while the U.S. media and political discourse of the wars focused on Taliban, Al Qaeda, and Bin Laden.

The students envisioned themselves as part of increasingly interconnected multiple world communities and indicated their interests in civic responsibility on the international stage. Benitez,

in a conversation on the FIFA World Cup in South Africa with a friend in Mexico, wrote on his Facebook page: “I enjoy the World Cup. It is good for South Africa. I like that the game brings positive attitudes from many countries around the world for South Africa.” Jazmine, in another conversation with a friend outside the U.S., questioned whether the government should have spent billions of dollars to host the World Cup in the face of massive unemployment in South Africa. Jazmine, during the interview, argued: “It is not right that the government spends several billions of dollars on soccer matches in a country with high unemployment and poverty. The government needs to create jobs for people.”

The students, across the data, connected new media literacies to their communities by sharing local news with people in the U.S. and the world. The students’ postings suggested that they were interested in building on their familiar knowledge of local community and then extending their understanding to world communities. In their self-identified literacy practices, as much as 100.00% of the students stated that they video recorded Mexican festivities such as baptism of babies, Christmas, weddings, *quinceañeras*, *Cinco de Mayo*, *Dia de la Calendaria* and posted them on social media. Also, 100.00% of the students indicated they shared photos of historic sites in their communities on social media including the National Wildlife Refuge, Algodones Sand Dunes, Anza Borrego Desert State Park, *Palenque*, *Chichen Itzá*, Great Pyramid of Cholula (the ancient Mayan civilization), and Church of Guadalupe.

The students also wrote in the commentary box that they like to watch news on cell phones. For example, 94 (91.26%) of them stated that they watched Telemundo, Univision, and Galavision to learn about events in Mexico. Rachel wrote: “I like to visit different websites to learn about the impact of the wars on Iraqis and Afghanis.” Clemente noted that he surfed websites: www.fifa.com/ to “know which nations are going to the next stage and which are going home from

the World Cup”. Unlike depersonalized and abstract textbooks that students generally consider boring, chatrooms such as www.spanishchat.com and www.amingo.chat allowed the students to hang out with their friends and read about issues that were of interest to them.

Discussion. Analysis of data regarding multiple world communities suggested that the students used new media as a resource to take up sociopolitical dialogues and perspectives that go beyond national borders. The students show the capacity to develop empathy and concerns for the plights of others. This finding is an important contribution to the literacy community because how transnational students use new media for engagement in sociopolitical conversations across geopolitical contexts that span multiple nations remains under-theorized despite the fact that literacy practices that youths develop from transnational spaces are important to their learning.

In today’s rapidly-changing and interconnected world, new media affords youth opportunities to participate in a new type of global citizenship that emphasizes inclusion and participation (Sánchez & Kasun, 2012). The participants’ experiences of living on the U.S.-Mexico border coupled with using new media to learn about other nations have shaped their notions of global citizenship. The students develop empathies toward the plights of people in Afghanistan, Iraq and South Africa. U.S.-Mexico border provides the youths with the knowledge and experiences to understand the meaning of a global citizen as “someone with empathies and insights about membership in a community that transcends local and national boundaries” (Sánchez, 2007, p.505). Equally important, the issues affecting global community such as climate change, poverty, and inequalities demand the attention of innovative youths who can use a broad range of literacy practices to create a better, fairer society in the increasingly interdependent and globalised world (Canagarajah, 2013). The findings suggest, first, that transnational students have multiple abilities they are now able to express with new media and second, that schools need to be better at validating

and supporting these abilities as part of students' literate identities and using them as a legitimate tool of learning in the increasingly interdependent and globalised world where multiple communicative resources are highly valued.

Translanguaging

Results across data suggested that the students employed translanguaging as a communicative tool to engage in social mobility talk and interactions in the U.S. and Mexico with their Mexican friends. Table 2 showed that the students expressed high frequency rates, with high mean scores ranging from 3.09 to 3.74 for using translanguaging to communicate across the U.S.-Mexico border. The students expressed high frequency rates with statements that they watched news in Mexico in Spanish, with a mean of 3.74; alternated between English and Spanish when speaking, with a mean of 3.69; and read for pleasure in English, with a mean of 3.63.

Table 3: The Participants Use Translanguaging to Communicate (N = 103)

Items: Languages I use in school and at home.	Mean	Median	Std. Statistics
23. I watch news in Spanish.	3.74	4.00	.71
24. I read Spanish texts at home.	3.39	3.00	.65
25. I read for pleasure in English.	3.42	3.00	.82
26. I watch Spanish channels.	3.63	2.00	.91
27. I alternate between English & Spanish at home.	3.69	3.00	.94
28. I translate from the English to Spanish language.	3.09	3.00	.65
29. I post messages on my social network pages in Spanish.	3.42	3.00	.72
30. I read Spanish websites to know what happens in Mexico.	3.77	3.00	.80

The students' printouts from social media indicated that they valued transnational literacies and translanguaging as tools for maintaining affiliations in a globalized world. Rather than viewing Spanish as a deficit, 100% of the participants embraced translanguaging as a resource in their global and local interactions. For example, Laura used translanguaging to describe what she liked in America in a text message to a friend in Mexico: "My cousin Lorena buy[s] everything she want[s]. If she want[s] something *ella lo compra. Si mira una ropa o algo que le gusta ella lo compraría*" [she buys it. If she sees clothing or something she likes, she will buy it]. Sandra texted about her expectations in her new country: "I want to get my Diploma for get a good job and *para ser una persona importante*" [to be an important person] in the future." These students used translanguaging to perform important social functions: an expression of familiarity and affiliation with friends in Mexico. The students accessed the linguistic databases of English and Spanish to express their ideas. Also, translanguaging becomes a sign of social bilingual identity and an affirmation of affiliations with friends and family members in Mexico.

The participants used translanguaging as a crucial linguistic resource for sharing life experiences in the U.S. with friends in Mexico. Eva expressed her appreciation for the opportunity to attend a school in the U.S.: "I am happy in my new school because I have the opportunity to finish high school *gracias a ustedes tender un mejor trabajo y seré una mejor persona*" [thanks to you all I will have a better job and will be a better person]. Marc emailed a friend in Mexico his understanding of what he needed to do in order to be a good worker in the U.S. economy: "I want to get [an] education. That will get me [a] good job. When I get [a] job I need to study *para ser una persona más eficiente* [to be efficient] at my work."

These students used translanguaging as a linguistic innovation for sharing ideas rather than depending on Spanish or English. The new reality is that the knowledge of one language may be

insufficient to meet the multiple languages required to participate at the intersection of global and local contexts. Marc, during the interview, explained: “I don’t worry about which language I speak. My concern is that I can communicate with my friends.” The students’ comments suggested that used translanguaging to maneuver through multiple languages without alienating their friends as translanguaging offers them opportunities to access two languages and feel comfortable in using them to interact online with friends in Mexico.

Translanguaging allowed the participants to engage in flexible though complex language practices to communicate across borders and express their new realities in the U.S. Adriana sent an e-mail to a friend in Mexico to discuss her hope for the future: “I am glad *que finalmente voy a ser importante* [that finally I will be important] for myself.”

The students employed translanguaging to maintain a web of social relations across U.S.-Mexico borders. During a follow-up interview, Guzman explained that he did not make a clear cut distinction between Spanish and English: “I use Spanish or English depending on what I want to say and the person I am talking to at that moment. I even go back and forth between the languages so that I can express myself clearly.” In local/global interactions, bilinguals access translanguaging to communicate efficiently rather than focusing on language itself.

Discussion. The data analysis regarding translanguaging indicates that the students use translanguaging to maintain affiliations with friends and family members across national borders. The students employ translanguaging to describe their new experiences in the U.S., including what they like and what is important to them. The findings show that translanguaging is a crucial linguistic resource that the students use to express their knowledge of Spanish and English and communicate in different ways, to different audiences, and for different purposes (Bailey & Orellana, 2015). For the participants, translanguaging is a reflection of new realities that they live

in two worlds, two cultures, and two languages, and “in between” or “middle ground” between U.S.-Mexico borders. The findings indicate that the fluidity of the contemporary world requires youths to use translanguaging as a linguistic innovation for border crossing even as they learn English. The findings add to existing studies that show transnational students use new media, bilingual contexts, bilingual knowledge, and bilingual literacies to build networks across local/global communities (see, for example, García, 2009; Hornberger & Link, 2012).

What is important is that the youths develop translanguaging resources in multiple crevasses and networked ensembles of contexts that are reflective of their multiple linguistic backgrounds. Youths develop complex linguistic practices to function in multiple, co-present, and overlapping communicative contexts and to triangulate languages, social relationships, and communicative patterns that more frequently cross linguistic and geographical borders (Blommaert, 2010; Domingo, 2012). Translanguaging is crucial in understanding the micro-politics of local/global interactions as it is not just an in-between zone “where global/local power relations are neutralized . . . but as a zone of symbolic ferment where power relations are surreptitiously re-inscribed” (Kraidy 1999, p. 460). Literacy teachers must envision pedagogy that affirms and leverages students’ translanguaging as a legitimate resource that youths develop and use for border crossing and traversing boundaries between genres and between media.

Crossing Genres and New Media

Data from the survey suggested that the transnational youths cross borders between genres and between media to maintain networks spread across nations. Reading across genres and media provided youths opportunities to learn life lessons as such texts generally address topical issues. The students expressed high frequency rates with statements that they read Spanish texts, with a mean of 3.84; read English and Spanish texts for pleasure, with a mean of 3.67; read newspapers

in Spanish and English, with a mean of 3.69; read cartoons and comics in English and Spanish, with a mean of 3.71; and read magazines in Spanish and English, with a mean of 3.67.

The interview and Facebook postings indicated that the students read a wide variety of materials for diverse purposes. The students' self-identified reading materials on the survey indicated that 91 (87%) of them read Spanish texts dealing with the richness of Latino/Mexican histories and cultures, including *Pedro Paramo* (hopes and dreams), *Los de abajo* (Mexican revolution), *Los cinco soles de Mexico* (experience of the ancient millennium in Mexico), and *Terra nostra (Hispanic civilization)*. These texts affirmed, celebrated, and supported their Latino cultural experiences and highlighted the different aspects of Latino cultures, hopes, dreams, family/community bonds, and history.

The self-identified reading materials on the survey also indicated that 87 (84.46%) of the students read English and Spanish newspapers and magazines because the materials use language and content that make a social statement on issues that youths care for such as teen pregnancy, self-esteem, lifestyles, education, relationships, self-improvement, depressions, and bullying. In particular, digital magazines give youths a space to be critical as they often critique what they see as "fake" images of beauty and write back to the editor to argue that the perfect image of beauty in a magazine is photoshopped and does not represent a real person.

The diverse genres that the students read expose them to literature types that reflect youths' life experiences. The students read materials that are engaging and credible in giving them a voice, portraying teens as protagonists (who move fluidly across national and linguistic borders), depicting experiences of border crossing, reflecting teens' struggle to resolve the coming-of-age issues such as sex, sexuality, relationships, and identity. In the students' self-identified texts on the survey, 88 (85.43%) of them wrote that they read diverse genres, including texts *Harry Potter*

(fantasy); *Twilight* (romance, fantasy, and action); *Los Tres Osos* (fables, folktales, and myths); and *Glamour* (photography — where youths are portrayed in romantic or sexually alluring ways).

Also, 100% of the students indicated they used new media such as Facebook, YouTube, Google, Websites, Instagram, Snapchat, Tumblr, and Twitter (see Table 4).

Table 4: The Participants’ Self-Identified Genres/Media (N = 103).

	Items	Names	Respondent	Percentage
Print-based Texts	Books	Harry Potter	87	89.69%
		Twilight	77	79.38%
		Los Tres Osos	68	70.10%
		Los cinco soles de Mexico	76.	78.35%
		Pedro Paramo	65	77.01%
		Diary of Anne Frank	78	80.41%
		Los de abajo	78.	80.41%
		Terra Nostra	76	78.35%
	Magazines	Low Rider	64	65.97%
		Sports Illustrated	76	78.35%
		Crepusculo	64	65.97%
		Seventeen	87	89.69%
		Glamour	83	85.57%
		Cosmopolitan en Español	87	89.69%
		Vogue	73	75.25%
		J-14 Magazine	92	94.85%
		Vanidades	83	85.57%
		Siempre Mujer	74	76.29%
		CosmoGirl Magazine	68	70.10%
		Alma	87	89.69%
People en Español	76	78.35%		
New Media	Web sites	YouTube.com	89	91.75%
		Photobucket	83	85.57%
		Extremesports.com	64	65.97%
		Tumblr	67	81.95%
		FaceBook.com	89	91.75%
		Instagram	89	91.75%
		Snapchat	92	94.85%
		Twitter	87	89.69%
	Google	100	100%	

		Yahoo	74	76.29%
		AOL	72	79.17%
	media	Cable network news	97	100%
		Video cassettes	90	92.78%
		Electronic games	95	97.94%
		Videogames	90	92.78%
		websites	100	100%
		Computer games	100	100%

Jorge, during an interview, argued that he read multiple genres to learn diverse views on an issue. Jorge stated: “I like to read from different genres and media so that I can learn information from many sources. As I read from different genres I see that many things that are not related on the surface are actually related.” Maria wrote in the commentary box on the survey that whenever she read an interesting book, she was always eager to share it with friends: “I tell my friends the book I enjoy because it makes sense to me. That means I learn some ideas from the book about how to do things.” The students’ comment suggests that crossing genre and media provided the students opportunities to read diverse texts, reflect on them, talk about the texts with friends, and apply new understandings in ways that could extend their learning. Unlike school texts that are typically geared toward passing high-stakes tests, the participants crossed genre and media borders to read materials that were interesting and relatable to their experiences.

Discussion. The data analysis suggests that the students read across media and genres. The participants’ reading practices reflect their multiple identities as Mexican-Americans, bi-nationals, bilinguals, adolescents, and on- and offline readers. The students’ reading interests and preferences are complex as they read Spanish texts dealing with the richness of Latino/Mexican histories and

cultures. They also read English media texts dealing with the general U.S. youth populations. The diversity shows that the students' reading interests and preferences are eclectic.

The important finding here is that the students read within and across genres and integrate new media to acquire knowledge from on- and off-line sources. Adolescents live in a complex, shifting and unpredictable social and media environment. Hence, youths have developed skills in reading across new media as well as newspapers, magazines, fictional and non-fictional texts, and photography. Youths' learning and everyday social and cultural activities "often rely on a convergence of digital and online media with print, analog, and non-interactive media types" (Ito et al, 2008, p. 8). Such eclectic textual practices allow youths to integrate ideas across multiple media and genres to learn and share information (Jenkins, 2006). The diverse genres, media, and content also reflect youths' multiple layers of identity and the diverse dimensions of their being (Cope & Kalantzis, 2000). The students' literacy practices call into question the mono-cultural, single context-, and print-based literacy that schools teach. The findings suggest that literacy instruction that recognizes and affirms students' everyday authentic literacies is critical to their learning, interest, motivation, and orientation toward school literacy.

Outside School and In-School Literacies

Literacy instruction may not have built on the students' social networks, textual artifacts, linguistic resources, and distributed knowledge networks they use as frames of reference for learning and cognitive development. Table 5 indicated that the students showed a low rate of agreement with statements that their teachers prepare them to combine different modes to show their understanding of what they learned, at a mean of 1.08; access websites to find additional information to supplement what they read, at 2.03; and teach them to use social network sites to share ideas with larger audiences, at a mean of 1.64.

Table 5: The Participants' Views of Literacy Instruction (N = 103).

Items: Literacy Instruction:	Mean	SE	Mdn
53. Teaches me how to combine different modes.	1.08	.07	2.00
54. Teaches me to access websites.	2.03	.06	3.00
55. Teaches me to how to upload texts & images.	1.61	.06	3.00
56. Teaches me how to use iPhone and iPad.	2.38	.06	3.00
57. Teaches me how to use search engines.	1.41	.07	3.00
58. Teaches me how to use the computer.	2.45	.06	3.00
59. My teacher assesses my knowledge of new media.	1.08	.07	2.00
60. My teacher teaches me how to use iPhone.	1.61	.06	3.00
61. My teacher teaches me to use educational websites.	2.48	.06	3.00
62. My teacher allows me to use social network sites.	1.64	.07	3.00
63. My teacher teaches me how to use weblog.	1.82	.06	3.00
64. My teacher creates a website for me to interact.	1.05	.07	2.00
65. My teacher uses online/computer games to teach.	1.81	.06	3.00
66. My teacher allows me to use interactive whiteboard.	2.18	.06	3.00
67. My teacher teaches me to use Student Response System.	1.08	.07	2.00
68. My teacher teaches me how to use podcasts.	1.04	.07	2.00
69. My teacher teaches me how to use chatroom.	2.03	.06	3.00
70. My teacher teaches me to create multimedia presentations.	2.48	.06	3.00
71. My teacher teaches me to use video clips.	1.25	.06	3.00
72. My teacher teaches me to use WebQuest.	1.04	.07	3.00
73. My teacher teaches me to use Wikis.	1.06	.07	2.00

Teaching transnational students to read and write requires teachers to link literary instruction to their lives and life-world—the world as directly experienced in the subjectivity of

their everyday lives. When I asked the 18 interview participants' their views about literacy instruction, 14 (77.78%) noted that they wanted teachers to tap into their outside school literacies for teaching. Ana stated that she wanted her "teachers to allow students to use chatrooms, blogs, and Facebook to do their assignments." Jasmine argued that teachers should integrate new media such as texting, Instagram, Snapchat, and Facebook into "English lessons to motivate students to write about topics that are relevant to their lives and interests." The students' comments suggest that the students want avenues to use new media as additional resources for learning. The student argued that unlike school literacy, social network sites "allow people to use any language in their profile. You don't have to use a language if you don't want to. You can post your photos and videos to tell your story." The profile section is the individual home page where youths use multiple modes including multiple languages, photos, and video clips to express themselves.

Jasmine, in the commentary box, noted that ELA instruction was too restricted to school-based topics instead of encouraging students to use their broad experiences of life for learning. She wrote: "I like websites and chatrooms because they allow people to talk about their lives, their feelings, and what they want to become." Ana stated: "I photoshop online and send photos of people like celebrities to my friends. Sometimes I create many photos [collage] on my profile page." The students' comments suggested that ELA teachers should connect instruction to new media so that learning could be fun, interesting, and engaging.

Discussion. Data analysis around literacy instruction suggests that the students' new media literacy practices are not integrated into school literacy instruction. Few studies have investigated the participants' views on how transnational and new media literacies have been integrated into literacy instruction to empower them to learn. The findings suggest that the students bring transnational and new media literacies to classrooms that can serve as additional (or compensatory)

resources for learning in ELA. Hence, it is important for teachers to consider how they might build on youths' literacy practices to help them to be successful in even more life contexts. More specifically, teachers must capitalize on students' experiences in ways that are affirming, supportive, and empowering for learning and interaction in increasingly connected and interdependent local/global worlds (Harper, et al, 2010).

The findings suggest that if teachers recognize their students' new media knowledge, educators will have a better chance of making learning worthwhile for the learners. ELA teachers can show that they value the transnational and media literacies that students bring to classrooms as resources for learning. In U.S.-Mexico border, literacy practices of youths are embedded in distributed networks where youths develop literacy practices within multiple communities of peers, virtual worlds, and local and distant worlds (Jacquemet, 2005). Hence, ELA teachers need to consider their students' trans-border experiences as they design literacy instruction.

Implications

The research objectives of this paper were to examine how the participants use new media literacies to cross borders and find out if their outside literacies are integrated into literacy instruction. The findings suggest that the students employ new media to cross borders, develop global awareness, and use translanguaging to read across genres; however, teachers do not build upon these literacy practices for student learning. The findings suggest a need to reexamine the assumptions that youths struggle with reading and writing because they are "unmotivated." Youths who are positioned as lacking in language facility or motivation or cognitive skills might be seen differently through access to their social media conversations. The findings also challenge educators to consider the role that text-types offered in school might play in students' engagement and learning. Schools need to (a) recognize that youths can do powerful things with text outside

of school and (b) confront the fact that lack of motivation to learn does not lie in the child but might be a matter of instructional practices (i.e., what are the opportunities to learn and scaffolds offered to support those opportunities?) or the quality of the texts being read in school.

Implications for ELA Teachers

Students' literacy repertoires arising from transnationalism and new media literacies are important functional and cultural assets that teachers should affirm and support as additional resources for literacy learning. ELA teachers need to recognize the funds of knowledge that youth acquire through engagement with sociopolitical conversations and make lessons relevant by drawing upon the topics (content of conversations), discourses, texts, and social interests that capture youths' attention and engagement. The participants read and wrote about specific issues and topics directly relevant to ELA classes such as their concerns about the plights of the young people in other nations, the DREAM Act bill, the role of the youth in fighting social injustices, and their views about the wars in Iraq and Afghanistan. The students' engagements with these issues show that they drew upon their diverse funds of knowledge they have acquired outside the school through social network interactions, readings, and experiences (Stockdill & Moje, 2013).

ELA teachers can make their lessons relevant to their students' lives by connecting topics to real life problems. Teachers can design activities that require students to use critical thinking skills and empathy to write about global issues. Such activities will provide safe spaces for students to develop their voices, empathize with people globally, and potentially contribute to building an equitable world.

Teachers can make ELA instruction engaging for students by understanding their motivating for writing: understanding and engaging with others across cultural borders rather than persuasion (Hull & Stornaiuolo, 2014). Hull and Stornaiuolo (2014) theorized that youths'

purposes for writing shifted from persuasion to understanding because their audiences are global, heterogeneous, and interactive. A deep analysis of the conversations that youths engage in as they negotiate understanding across cultures is extremely powerful and can help educators think differently about what and how they teach writing, especially in the era of the Common Core's focus on "evidence-based argument." ELA teachers can prepare students to be strong citizens in an increasingly diverse society by focusing on helping them hone their writing-for-understanding skills or on learning when argument is more useful than understanding, and vice versa.

Implications for Literacy Researchers

There is a need for literacy researchers to ask some fundamental questions regarding the literacy practices of youths: How can literacy education focus on "the local-global interface — the world in our classroom and the classroom in the world" (Harper et al, 2010, p. 9)? What texts/media do students find engaging and pertinent to their lives? How are students' home, school, and global literacies relationally connected? How can students' broad range of literacies acquired through new media be converted to cultural capital to inform instruction? How might teachers make the most of students' outside school literacies as scaffolds for learning? When instruction captures learners' trajectories across local, global, genre, linguistic, and media borders, learning would become "embodied cognitive activities [where] learning becomes situated, reciprocal, and distributed, leading to new forms of learning" (Gutiérrez, 2008, p. 159). This is the kind of learning that should be happening in today's schools.

Limitations

Because only 25% of students from each school participated, the pattern of new media literacies observed in this study may not automatically generalize to 75% of Mexican-American transnational students in the participating schools (or similar schools) who did not participate.

Note

1. Author, "Appendixes A & B: Questionnaire,"

https://www.dropbox.com/s/r8kw4w30vtec5sx/mexican-american_transnational_student_survey.pdf

² DREAM Act is an acronym for a bill in the U.S. Senate titled Development, Relief, Education for Alien Minors – a bill that will allow certain immigrant students who have grown up in the U.S. to apply for temporary legal status. For details, see the National Immigration Law Center at

<http://nilc.org/dreamsummary.html>.

References

- Alvermann, D. (2006). Technology use and needed research in youth literacies. In M. McKenna, L. Labbo, R. Kieffer & D. Reinking (Eds.), *International handbook of literacy & technology*, Vol. II (327 – 333). Mahwah, NJ: Erlbaum.
- Alvermann, D. (2011). Popular culture and literacy practices. In M. Kamil, P. Pearson, E. Moje & P. Afflerbach (Eds.), *Handbook of Reading Research IV* (541–560) New York, NY: Routledge.
- Bailey, A. & Orellana, M. (2015). Adolescent development and everyday language practices: Implications for academic literacy and multilingual learners. In D. Molle, E. Sato, T. Boals, & C. Hedgspeth (Eds.), *Multilingual learners and academic literacies: Sociocultural contexts and literacy development in adolescents*. New York, NY: Routledge.
- Beach, R. & O'Brien, D. (2008). Teaching popular-culture texts in the classroom. Using new media in the secondary English classroom. In J. Coiro, M. Knobel, C. Lankshear & D. Leu (Eds.), *Handbook of research on new literacies* (775–804). New York, NY: Erlbaum.
- Blommaert, J. (2003). Commentary: A sociolinguistics of globalization. *Journal of Sociolinguistics*, 7(4), 607–623.
- Blommaert, J. (2010). *The sociolinguistics of globalization*. Cambridge, Cambridge University Press.
- Buckingham, D. (2006). *Digital generations: Children, young people, and new media*. Mahwah: NJ; Erlbaum.
- Canagarajah, S. (2006). The place of world Englishes in composition: Pluralization continued. *College Composition & Communication*, 57(4), 586–619.

- Canagarajah, S. (2013). Introduction. In Canagarajah, S. (Ed.), *Literacy as translingual practice: Between communities and classrooms* (pp. 1–10). New York, NY: Routledge.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative Analysis*. Los Angeles: SAGE Publications.
- Coiro, J. (2003). Exploring literacy on the Internet. *The Reading Teacher*, 56(5), 458–464.
- Coiro, J., Knobel, M., Lankshear, C & Leu, D. (2008). *Handbook of research on new literacies*. New York, NY: Erlbaum
- Connor, C., Goldman, S. & Fishman, B. (2014). Technologies that support students' literacy development. In J. Spector, M. Merrill, J. Elen & M. Bishop (Eds.), *Handbook of research on educational communications and technology* (4th edition) (pp. 591–604). New York, NY: Springer.
- Corbin, J. & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Los Angeles, CA: SAGE publications.
- Cope, B. & Kalantzis, M. (2000). *Multiliteracies: Literacy learning and the design of social futures*. London, Routledge.
- Creswell, J. (2009). *Research design: Qualitative, quantitative and mixed methods approaches* (3rd edition). Los Angeles, CA: SAGE.
- de la Piedra, M. & Araujo, B. (2012). Transfronterizo literacies and content in a dual language classroom. *International Journal of Bilingual Education & Bilingualism*, 15(6), 705–721.
- Denzin, N. (2010). Moments, mixed methods, and paradigm dialogs. *Qualitative Inquiry*, 16(6), 419–427.
- Domingo, M. (2012). Linguistic layering: social language development in the context of

- multimodal design and digital technologies. *Learning, Media & Technology*. Retrieved December 6, 2012 from: steinhardt.nyu.edu/.../Domingo%20Linguistic%20Layering%2.
- Fairclough, N. (2002). Language in new capitalism. *Discourse & Society*, 13(2), 163–166.
- Farr, M. (2006). *Rancheros in Chicagoacán*. Austin, TX: University of Texas.
- Garcia, O. (2009). *Bilingual education in the 21st century: A global perspective*. New York: Blackwell/Wiley.
- Garcia, O. & Wei, L. (2014). *Translanguaging: Language, bilingualism and education*. London, UK: Palgrave.
- Glick Schiller, N; Basch, L.; & Szanton Blanc, C. (1995). From immigrant to transmigrant: Theorizing transnational migration. *Anthropological Quarterly*, 68(1), 48-63.
- Gonzalez, N., Moll, L. & Amanti, C. (2005). *Funds of knowledge: Theorizing practices in households, communities, and classrooms*. Mahwah, NY: Erlbaum.
- Gutiérrez, K. (2008). Developing a sociocritical literacy in the third space. *Reading Research Quarterly*, 43(2), 148–164.
- Gutiérrez, K., Bien, A., Seland, M. & Pierce, D. (2011). Polylingual and polycultural learning ecologies: Mediating emergent academic literacies for dual language learners. *Journal of Early Childhood Literacy*, 11(2), 232 – 261.
- Harper, H., Bean, T. & Dunkerly, J. (2010). Cosmopolitanism, globalization, and the field of adolescent literacy. *Canadian & International Education*, 39(3), 1 – 13.
- Hornberger, N. & Link, H. (2012). Translanguaging and transnational literacies in multilingual classrooms. *International Journal of Bilingual Education & Bilingualism*, 15(3), 261–278.
- Hull, G. & Stornaiuolo, A. (2010). Literacy arts in a global world: Reframing social networking as cosmopolitan practice. *Journal of Adolescent and Adult Literacy*, 54(2), 85–97.

- Hull, G. & Stornaiuolo, A. (2014). Cosmopolitan literacies, social networks, and “proper distance”: Striving to understand in a global world. *Curriculum Inquiry*, 44(1), 15–44.
- Ito, M., Horst, H., Bittanti, M., Boyd, D., Herr-Stephenson, B., Lange, P., Pascoe, C. & Robison, L. (2008). *Living and learning with new media: Summary of findings from the digital youth project*. Chicago, IL: The MacArthur Foundation.
- Jacquemet, M. (2005). Transidiomatic practices: Language and power in the age of globalization. *Language & Communication*, 25(3), 257–277.
- Jenkins, H. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century. An occasional paper on digital media and learning*. John D. & Catherine T. MacArthur Foundation.
- Johnson, R., Onwuegbuzie, A. & Turner, L. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2) 112–133.
- Kirkland, D. & Hull, G. (2011). Literacy out of school. In M. Kamil, P. Pearson, E. Moje & P. Afflerbach (Eds.), *Handbook of Reading Research IV (711–725)*, New York, NY: Routledge.
- Kostogriz, A. & Tsolidis, G. (2008). Transcultural literacy: Between the global and the local. *Pedagogy, Culture & Society*, 16(2), 125–136.
- Kraidy, M. (1999). The global, the local, and the hybrid: A native ethnography of globalization. *Critical Studies in Mass Communication*, 16, 456–476.
- Kress, G. (2000). A curriculum for the future. *Cambridge Journal of Education*, 30(1), p. 133–145.

- Lam, W. (2009). Multiliteracies on instant messaging in negotiating local, translocal, and transnational affiliations: A case of an adolescent immigrant. *Reading Research Quarterly*, 44(4), 377–397.
- Lam, W. & Rosario-Ramos, E. (2009). Multilingual literacies in transnational digitally mediated contexts: An exploratory study of immigrant teens in the United States. *Language & Education*, 23(2), 171–190.
- Lam, W. & Warriner, D. (2012). Transnationalism and literacy: Investigating the mobility of people, languages, texts, and practices in contexts of migration. *Reading Research Quarterly*, 47(2), 191–215.
- Leander, K., Phillips, N. & Taylor, K. (2010). The changing social spaces of learning: Mapping new mobilities. *Review of Research in Education*, 34, 329–394.
- Levitt, P. (2009). Roots and Routes: Understanding the Lives of the Second Generation Transnationally. *Journal of Ethnic and Migration Studies*, 35(7), 1225–1242.
- Livingstone, S. (2008). Internet literacy: Young people's negotiation of new online opportunities. In T. McPherson (Ed.), *Digital youth, innovation, and the unexpected* (101-122). (The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning). Cambridge, MA: The MIT Press.
- Maxwell, J. (2006). Literature reviews of, and for, educational research: A commentary on Boote and Beile's "Scholars Before Researchers." *Educational Researcher*, 35(9), 28–31.
- Mayer, R. (2014). Multimedia instruction. In J. Spector, M. Merrill, J. Elen & M. Bishop (Eds.), *Handbook of research on educational communications and technology* (4th ed.) (385–399). New York, NY: Springer.
- McLean, C. (2010). A space called home: An immigrant adolescent's digital literacy practices.

- Journal of Adolescent & Adult Literacy, 54(1), 13–22.
- Merriam, S. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Wiley & Sons.
- Mignolo, W. (2000). *Local Histories/Global Designs: Coloniality, Subaltern Knowledges and Border Thinking*. Princeton, NJ: Princeton University Press.
- Moje, E. B., & van Helden, C. (2005). Doing popular culture: Troubling discourses about youth. In J. A. Vadeboncoeur & L. P. Stevens (Ed.), *Re/constructing “the adolescent”*: Sign, symbol, and body (pp. 211-247). New York: Peter Lang.
- Moje, E., Overby, M., Tysvaer, N. & Morris, K. (2008). The complex world of adolescent literacy: Myths, motivations and mysteries. *Harvard Educational Review*, 78(1), 107–154.
- New Media Consortium. (2005). *A global imperative: The report of the 21st century literacy summit*. Retrieved March 23, 2014 from http://www.nmc.org/pdf/Global_Imperative.pdf.
- Pew Hispanic Center (2013). *Closing the Digital Divide: Latino and technology adoption*. Retrieved October 31, 2013 from http://www.pewhispanic.org/files/2013/03/Latinos_Social_Media_and_Mobile_Tech_03-2013_final.pdf.
- Sánchez, P. (2007). Urban immigrant students: How transnationalism shapes their world learning. *The Urban Review*, 39(5), 489–517.
- Sánchez, P. & Kasun, S. (2012). Connecting transnationalism to the classroom and to theories of immigrant student adaptation. *Berkeley Review of Education*, 3(1), 71–93.
- Sánchez, P. & Salazar, M. (2012). Transnational computer use in urban Latino immigrant communities: Implications for schooling. *Urban Education*, 47(1), 90–116.
- Schultz, K. & Hull, G. (2008). Literacies in and out of school in the United States. In B. Street &

- N. H. Hornberger (Eds.), *Encyclopedia of language and education*, 2nd Edition, Vol. 2: Literacy, 239–247. New York, NY: Springer.
- Skerrett, A. (2012). Languages and literacies in translocation: Experiences and perspectives of a transnational youth. *Journal of Literacy Research*, 44(4), 364–395.
- Smith, R. C. (2006). *Mexican New York: Transnational lives of new immigrants*. Berkeley, CA: University of California Press.
- Snyder, I. & Bulfin, S. (2008). Using new media in the secondary English classroom. In J. Coiro, M. Knobel, C. Lankshear & D. Leu (Eds.), *Handbook of research on new literacies* (805–837). New York, NY: Erlbaum.
- Stockdill, D. & Moje, E. (2013). Adolescents as readers of social studies: Examining the relationship between youth's everyday and social studies literacies and learning. *Berkeley Review of Education*, 4(1), 35–68.
- Teddlie, C. & Tashakkori, A. (2010). Overview of contemporary issues in mixed methods research. In Tashakkori, A. & Teddlie, C. (Eds.), *SAGE Handbooks of mixed methods in social and behavioral research* (2nd edition) (1–41). Los Angeles, CA: SAGE.
- U.S. Census Bureau. (n.d.). Imperial County quickfacts from US Census Bureau. Retrieved March, 2014 from <http://quickfacts.census.gov/qfd/states/06/06025.html>.
- Valenzuela, A. (1999). *Subtractive schooling: U.S.-Mexican youth and the politics of caring*. New York, NY: State University of New York Press.
- Vélez-Ibáñez, C. & Sampaio, A. (2002). Processes, new prospects, and approaches. In Vélez-Ibáñez, C. & Sampaio (Eds.), *Transnational Latina/o communities: Politics, processes, and culture* (p. 1 – 37). New York, Rowman & Littlefield Publishers.
- Yardi, S. (2008). Whispers in the classroom. In T. McPherson (Ed.), *Digital youth, innovation,*

and the unexpected (pp. 143-164). (The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning). Cambridge, MA: The MIT Press.

Yi, Y. (2009). Adolescent literacy and identity construction among 1.5 generation students: From a transnational perspective. *Journal of Asian Pacific Communication*, 19(1), 100–129.

The Virtual Communication Aspect: A Critical Review of Virtual Studies Over the Last 15 Years

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Abstract

This study is a critical analysis of the virtual research conducted over the last 15 years in which virtual communication played a key role. The study found that a definite pattern of criteria is being used when successful virtual communication is utilized in the workplace. This study is the first part of a two-phase research project and has identified these success criteria from current research on virtual communication in order to conduct a follow up field study. The second study will use a measurement rubric developed in this study to analyze if businesses are successfully using virtual communication or not.

In today's global environment, business meetings are no longer limited by physical boundaries. Instead, companies increasingly are requiring employees to conduct interviews, pursue projects, and hold meetings without ever being in the same room or the same country. However, using this technology is not the same as using technology effectively. To be adequately prepared to participate effectively in this virtual arena, it is imperative that researchers analyze and discover how organizations and workers effectively function in this setting. Today employees may be sitting alone at their desk attending a virtual meeting with colleagues they have never met, each of them in separate offices at different geographic locations. There have been many studies and several new books examining managing virtual teams and the virtual worker (Johnson, Bettenhausen & Gibbons, 2009; Sobel-Lojeski & Reilly, 2008; Flatley, 2007), which discuss several different techniques for improving virtual communication. However, little research has actually analyzed major studies by just focusing on the virtual communication aspect. The purpose of this research is to conduct a critical review of the studies analyzing the use of virtual communication in organizations and whether using this technology is or is not improving communication in the workplace. During this investigation I will also identify "success criteria" from the major studies in the field of business communication and develop a rubric to measure the use of this criteria in the workplace.

In Natalie Burg's 2013 Forbes magazine article, she states that most business communication today still depends on conference calls and email chains, which make it challenging to get to know your partners. According to a 2007 Stanford study, 20% of the workforce have never met their boss fact-to-face. (House, Presentation at Media X Summer Institute) However, even though more communication has moved to being virtual, most business professionals are still communicating as if it is face-to-face communication (Berry, 2011; Kidde,

2014; Majchrzak, Malhotra, Stamps, & Lipnack, 2004). Professionals are also spending too much time searching for information and there is a need to use more social media to connect better with other team members (Cardon & Marshall, 2015). In 2000, 70 percent of young adults used the Internet and that figure has steadily grown to 96 percent today. Pew research studies have found that in 2015 nearly 64 percent of US adults own a smart phone and mostly use it for texting, voice, Internet, email and social networking. The world has moved to communicating virtually on a day-to-day basis and so has the workforce. The question is: are these businesses communicating successfully virtually?

There have been many studies conducted in multiple fields from management to business communication analyzing virtual teams, virtual workers, and virtual distance (Andres, 2012; Sobel-Lojeski & Reilly, 2008; Duarte & Snyder, 2001; Reinsch & Warisse-Turner, 2006; Suh, Shin, Ahuja, & Kim, 2011). Communication plays a key role in this research but very little of the research focuses on the virtual communication aspect. Of course several factors (Technology Choice, Trust, Leadership, Culture, etc.) effect virtual communication and many studies do discuss Computer-Mediated-Communication (CMC) but few explore the true impact of virtual communication in the workplace (Qureshi, Liu & Vogel, 2006). Lojeski and Reilly agree that, "Communication problems strongly influence every aspect of virtual distance. They're the most insidious issue in today's global workforce and overcoming them requires a tireless effort by both team members and management" (p. 99, 2010). Thus, we need to analyze virtual studies that research the workplace and focus on the virtual communication problems and successes. This will help employers and workers improve their virtual skills by identifying communication problems at an earlier stage and teach them how to correct communication breakdowns.

Therefore this study's research question is: What are the successful strategies or criteria used in virtual communication in the workplace as identified in virtual research?

Methodology

This inquiry gathered hundreds of studies over the last 15 years that analyzed and discussed virtual teams, virtual workers, virtual distance and virtual communication. Forty studies were selected for critical review because virtual communication played a main role in their analysis. These studies came from a variety research fields but the majority from the Journal of Business Communication, the Journal of Business and Technical Communication, the Business Communication Quarterly, the Journal of Management, and the Journal of Management Information Systems. I identified the studies that virtual communication played a key role in the outcome through critical analysis based on the methodology used in Duarte and Snyder's 2001 book titled, "Mastering virtual teams: Strategies, tools, and techniques that succeed" as well as Qureshi, Liu, & Vogel study in 2006. Duarte and Snyder identified four competencies critical to successful virtual teams: communication, establishing expectations, allocating resources, and modeling desired behaviors. While Qureshi, Liu, & Vogel identified communication elements and structures that help make virtual teams successful such as team and task characteristics, communication technology choice, management strategies, communication patterns and information sharing and processing (p. 59). Therefore, virtual studies that set clear rules or expectations when using certain types of technology, defined effective work completion, laid out general team norms and expectations, included time lines and specified team member outcomes, and used documentation systems met the criteria to be critically reviewed for this study (Duarte & Snyder, 2001).

In addition, these forty studies regularly came up when the search string "virtual

Communication” was searched as the key term in academic research databases. An additional search of current studies was conducted in 2016 and only one academic study met the criteria, a dissertation by Ryan N. Mitchell on *The Correlation Between Virtual Communication and Employee Engagement*. All other discourse on this topic conducted over the last year that met this study’s criteria were business articles, which focused on professional opinions not scientific research.

In order to critically analyze the virtual studies a clear definition of virtual communication is needed. Webster’s dictionary defines virtual as “very close to being something without actually being it or existing/occurring on computers or on the Internet” and defines communication as “the act or process of using words, sounds, signs, or behaviors to express or exchange information or to express your ideas, thoughts, feelings, etc., to someone else” (online: <http://www.merriam-webster.com/dictionary>, November 5, 2015). Thus, virtual communication is the simulated process of people exchanging information using computers or the Internet. A 2010 Cornell study defines virtual communication as using both synchronous (simultaneous) and asynchronous (delayed interaction) methods such as phone, audio and video conferencing, and e-mail. Virtual Communication can also be defined as “the process of transferring information, meaning, and understanding between two or more parties, and there is a huge amount of literature on how this process can be made more efficient and effective” (Berry, 2011, p. 192). For the purposes of this study virtual communication will be defined as people using technology to communicate with each other when they are not physically face-to-face.

The next step in the process is to define what “successful criteria” means? Success can be defined in many ways depending on the situation but for the purposes of this study the term success or successful will be defined as completing or accomplishing a goal. Dictionary.com

defines criteria from the Greek word *critérios*, which is a standard of judgment or criticism; a rule or principle for evaluating or testing something (online: <http://dictionary.reference.com/browse/criteria>, November 17, 2015). In this study, I will identify virtual communication rules or principles that help groups accomplish goals such as completing a project that improves an organization internally or externally. These “successful virtual communication criteria” will help to decrease virtual distance, which has been proven to increase virtual teams’ success rate. “Virtual Distance is a psychological distance created between people by an overreliance on electronic communication – no matter where those communications originate and end” (Sobel-Lojeski & Reilly, p. 10, 2010). As virtual distance increases Sobel-Lojeski & Reilly study shows a 50% decline in project success, 90% drop in innovation effectiveness, 80% plummet in work satisfaction, 83% decrease in trust, 65% decrease in role and goal clarity, as well as a 50% decline in leadership (p. xii).

Virtual Research Studies from 2000-2015 with Virtual Communication as a Key Factor

Wong and Burton, in 2000 designed a simulation study to look at the impact of different team characteristics on team performance. They focused on team context, composition and structure and found that the virtual context team worked better than the virtual composition team. They also learned that the virtual structure team performed better than the software development team. The criteria that helped the virtual and structural teams do better was making it easier and more routine to communicate, clarifying role expectations, fostering team culture and empowering virtual team members. Also in 2000, Lurey & Raisinghani analyzed 67 individuals that made up 12 virtual teams at eight global companies in an effort to identify the factors that lead to successful virtual teams. They discovered that communication and technology related issues that were not addressed did hinder the success of the team and that more ftf meetings were

needed so the team could bond and build more trust. These studies show that as early as the year 2000 virtual research was uncovering that communication was a key factor in the success of virtual teams.

In 2001 researchers Pauleen & Yoong's study examined how virtual team facilitators use Internet-based and conventional electronic communication channels to build relationships with their virtual team members. They observed that some electronic communication channels are more effective than others in building online relationships and suggested that facilitators needed to strategically use the channels available to them to effectively build online relationships (p. 1). This study also found that team members believed meeting ftf early on helped build the virtual team's relationships and greatly improved communication. They noticed a great deal of miscommunication because these virtual teams relied heavily on using email and text messaging, which is easy to understand for a study conducted in 2001. However, this study pointed out what many of the studies over the last 15 years have also discovered that using multiple communication channels is vital to successful virtual communication and virtual teams. In another 2001 experimental study Beth Dietz-Uhler and Cathy Bishop-Clark looked at the effects of synchronous and asynchronous computer-mediated communication (CMC) on subsequent face-to-face (ftf) discussions using college age students at a Mid-western university. The study uncovered that "face-to-face discussions preceded by either synchronous or asynchronous computer-mediated communication were perceived to be more enjoyable and include a greater diversity of perspectives than face-to-face discussions not preceded by computer-mediated communication" (p. 269). These studies show that a combination of ftf and CMC appear to improve overall communication and thus increase the likelihood of the team's success.

In 2002, Baltes, Dickson, Sherman, Bauer, & LaGanke, conducted a meta-analysis of

research comparing decision making in face-to-face versus computer-mediated communication groups. The study's results suggested that, "computer-mediated communication leads to decreases in group effectiveness, increases in time required to complete tasks, and decreases in member satisfaction compared to face-to-face groups" (p. 156). Virtual groups have difficulty building trust as quickly as ftf groups so it takes longer for groups to bond and work more effectively using just CMC. Researchers Isaacs, Walendowski, Whittaker, Schiano, & Kamm, 2002 study also discovered that in these virtual environments, communication is the fundamental tool of work activities: negotiations, information exchanges, requests, giving orders, brainstorming; but even social, non-task-related interactions take place via various mediated channels. Their analysis showed that virtual groups build trust through consistent communication using multiple channels. That same year Rutkowki, Vogel, Genuchten, Bemelmans, & Favier article on the reality of virtuality came to similar conclusions that timely feedback is critical in the early phases of virtual teams.

As virtual research headed into 2003, Cornelius and Boos looked into the ineffective use of text-based synchronous CMC, and how it affected the quality of communication compared to face-to-face communication. They learned that CMC often impairs performance and that users needed to be communication experts to overcome the negative effects of using the technology. They also found that the best performance scores came from the ftf groups and CMC groups that had extensive training on communicating using CMC especially chat rooms. Many Studies analyzing virtual communication seem to be ill-defined and lack support, and stated that "virtual communication is confusing" (Thompson & Coover, 2003), and "more laborious and more cognitively taxing" than face-to-face communication (Cornelius & Boos, 2003). As technology improved virtual studies began to grow as an area of research and the studies have become more

rigorous.

By 2004 Kirkman, Rosen, Tesluk, & Gibson analyzed 35 sales and service teams at a high technology company to see if ftf interaction effected the relationship between team empowerment and virtual team performance. They found the ftf interaction could be the key to virtual team empowerment and that teams were more likely to take corrective action with regular ftf interaction. Teams that met rarely ftf became more passive and relied on their leaders more and over estimated “perceived constraints around taking corrective action” (p. 186). Furst, Reeves, Rosen, & Blackburn, also in 2004 had similar findings in their study when they interviewed, surveyed and observed six virtual teams at FOODCO, one of the largest food distributors in the United States. Furst et al observed “there is growing evidence that virtual teams fail more often than they succeed” (p. 6) and that early ftf meetings as well as managers intervening at each group stage (forming, storming, norming, & performing) helped the team build trust and move successfully through the process. Researchers Majchrzak, Malhotra, Stamps, & Lipnack also argued in their 2004 study that any dispersed team requires at least some face-to-face communication for success, although the sophisticated use of advanced communication technology can be an effective alternative. For example, Cameron & Webster, 2005 study on instant messaging (IM) and its use in organizations analyzed interviews with employees, who viewed IM as privacy enhancing, but also saw its interruptive nature as unfair (p. 85). This case study showed that employees use IM not only as a replacement for other communication media but also as an additional method for reaching others. As virtual research expanded it was becoming very clear, that multiple communication channels needed to be engaged for successful virtual communication to be a possibility. The virtual studies also began to take a look at the users more and how communication technologies were affecting employees.

In 2005 virtual research started to focus more on the communication element of the virtual business world and the quantity of studies increased. AAKirman and Harris compared levels of communication satisfaction between virtual workplace and traditional workplace employees in a single firm using Down and Hazen's Communication Satisfaction Questionnaire. Based on previous research, this study developed and tested hypotheses that traditional workers would have higher levels of satisfaction in personal feedback, communication climate, relationship with supervisors, horizontal and informal communication, organizational integration and overall communication satisfaction. They discovered that virtual office workers were more satisfied with organization communication than traditional office workers. The findings showed how this firm actually took steps recommended by the researchers and consultants by improving upper level support, using appropriate technology, getting timely technological support, training virtual members on technology use and cultural differences. This organization also restructured the work to support a virtual workplace, and provided extra social support systems to reduce alienation.

Meanwhile, Tavčar, Zavbi, Verlinden & Duhovnik 2005 study analyzed the virtual workplace by looking at the specifics of communication and work within a virtual development team. They observed an international course on European global product realization that provided students with their initial experiences in working within a global team. The researchers learned that special knowledge and skills of virtual team members' is a greater obstacle than technical equipment and that work within a virtual product development team requires intense communication, which is possible via videoconferencing (p. 557). The researchers believed their recommendations could be applied in both university and industrial environments and yet can intense videoconferencing solve all the challenges team member face when communicating

virtually. Brian Dineen's 2005 study appears to support that more visual technology needs to be used because they discovered the students did not feel like they could trust members that they did not get to know or bond with in an interpersonal way. He found that team cohesiveness and social loafing behavior were lower in teams where membership changed over the length of the project than in stable teams (p. 593). Dineen analyzed students in an organizational behavior course over eight weeks using WebCT for a virtual team project. While many students responded positively to the TeamXchange project 22% had major concerns about social loafing during the project and having to depend on strangers for a grade. (p. 610). The study's subjects communicated in a text-based way such as email, chat rooms, discussion boards and had little to no use of visual communication.

Paul Argenti discussed the advantages and disadvantages of communication technology in his 2006 article. For example, a message can be shared with outside people although it was intended for an internal audience only and this can have a very damaging effect on customer and employee relations. However, he also sees communication technology helping companies that embrace it by using it on a consistent and regular basis to reach out and limit miscommunication and help with branding. As the workforce become more mobile an empowered employee base, and a broader audience for organizational information has created a power shift (p. 360).

Technology has profoundly changed business communication and the workplace over the last ten to fifteen years and those who learn how to successfully use these technologies such as virtual communication will be the businesses that grow as well as succeed. In 2006 Starke-Meyering & Andrews conducted a semester long intercultural virtual team project in a management communication course at a U.S. and Canadian college. They found that, "Success in this

complex environment depends on a shared culture that facilitates the making of knowledge and the best contributions of all team members” (p. 25). The researchers also agreed with other virtual studies that digital technologies present a number of communication challenges including trust, time conflict, cultural differences, and the need for a “robust collaborative workspace”. Reinsch & Warisse-Turner, 2006 descriptive study looked into how new technology effects employees by enhancing worker efficiency, encouraging alteration, and helping workers adapt to new tasks and jobs (p. 342). They see business communication changing and workers now need to, “read, write, view and sketch in a wider array of media and genres” (p.346). Business communication is about more than one-to-one or small group communication in a collocated organization but has expanded to one-to-group internally as well as across boundaries of an organization located anywhere. Thus, workers and students currently studying business communication need to meet the challenges of using multiple media to communicate successfully in today’s workplace.

Warisse-Turner and Reinsch conducted another study in 2007, where they coined the term multicommuting. “This new pattern of communication suggests that being virtually present with more people by staying involved in more ongoing communications may be a new goal of business communication” (p. 37). The researchers see multicommuting as different from multitasking because communication is interactive, requires feedback, and is multidimensional. They believed this was the new norm in business communication and conducted two exploratory studies using qualitative and quantitative methodology. In the qualitative study they interviewed and observed 20 individuals at a large high tech company and found, “that multicommuting occurred very frequently: Every interviewee indicated that it was a common practice in the organization” (Warisse-Turner and Reinsch, 2007 p. 44). In the

quantitative study they administered a questionnaire to 250 young professionals who had left jobs and were now in an MBA program. This part of the study found that a respondent was less likely to multicomunicate when the person on the other side of the communication was described as a superior and more likely to multicomunicate when the receivers was at an equal or lower power level in the organization. The study did not answer at all “to what degree a person is capable of effectively multicomunicating” but did find that this type of communication is happening more in the workplace (p.53). Qureshi, S., Liu, M., & Vogel study found that communication played a central role in the virtual teams performance and that trust issues and limited communication limits success. They studied 21 distributed virtual teams made up of university students from a university in the Netherlands and Hong Kong. The teams ran into the same issues that always plague virtual teams, time zone conflicts, cultural issues that slow productivity and increase miscommunication. They discovered that “properly using communication technology profoundly influences the communication, coordination of temporal as well as cultural issues and adaption processes such as managing conflicts” (2006, p. 71).

May & Margolis surveyed and interviewed 45 undergraduate students in a managerial communication course “to compare and contrast the successful and unsuccessful teams to identify the factors that impact performance” (2006, p. 1). The researchers looked at the learning outcomes in the context of online learning and virtual teams and identified five problems areas, “Team Membership, Action Plan, Communication, Goals, and Leadership”. As usual communication played a key role in the success or failure of these virtual teams. The researchers discovered that having the right team members, creating a plan of tasks, responsibilities, deadlines and deliverables; establishing ground rules and guidelines for regular communicating; understanding group goals; and having a leader that facilitates effective teamwork creates

successful teams. However, these same factors are key to successful ftf groups, it just costs more to bring people together in a physical setting and appears to take longer to build successful virtual groups. A major deficiency in unsuccessful virtual teams was the lack of good team leadership, which can also be said of ftf groups (p. 14). Nonetheless, virtual teams and groups are here to stay both in the classroom and the workplace so it is vital that we identify the key “success criteria” for implementing virtual communication in either environment. “Effective communication is essential in any class but even more so in a virtual class” and “Virtual communication makes it hard to read people and to learn content” (May & Margolis, 2006). One student response from this study sums up the importance of communication in the virtual world better than any researcher ever could, “Communicate, communicate, communicate. Be sure everyone is on the same page. Double Check” (p. 13).

Gail Fann Thomas 2007 article discusses the importance of academics bridging the research gap and collaborating more with professionals. This would help make business communication researchers more “credible and demonstrate a better understanding of contemporary and future dilemmas in the world of work” (p. 284). At this point, there had been a major shift from countries globalizing to individuals globalizing and thus virtual communication had become a key element in the changing workplace as business communication evolved. However, De Pillis & Furumo (2007) found that virtual teams are often less efficient and have increased cost and increased time to complete their project. These studies see virtual teams as an asset to the workplace but at a cost to overhead and time in set up and training. Weimann, Hinz, Scott & Pollock’s findings also showed that regular face-to-face meetings, email and phone still played a pivotal role in team communication, even though a variety of communication tools are available. Further, like non-distributed teams, a need for

common ground and shared meaning, or social context, are essential elements for the communication within a distributed team (2010, p. 187). Weimann, Hinz, Scott & Pollock's results support the argument that virtual teams can't reach a similar performance level as traditional teams due to communication deficiencies and visibility of team members" (p. 194). The same issues of miscommunication and difficulty building trust between team members continued to plague virtual teams and their use of virtual communication tools such as email, live chats, and teleconferencing.

In 2008 Holly Duckworth's study on TRW Automotive manufacturing observed, "Global virtual teams have the deck stacked against them: long distances, cultural differences, lack of social cues to help gauge each other's trustworthiness and leaders unprepared to deal with these challenges" (p.6). In her study she recorded and observed employees working in virtual teams and discovered that the lack of nonverbal and social cues played a large role in the teams being less productive. This study linked successful communication to improved productivity and found that leaders needed to make members commitments visible to each other by maintaining clear and consistent work practices through clear communication and creating a team memory (2008, p. 9). Once again teams and workers using virtual communication needed to build trust in order to be successful and so researchers kept looking into how media played a role in blocking or building that trust. For example, Rockmann and Northcraft 2008 study examined how media richness impacted affective-based trust and cognitive-based trust. The researchers conducted two studies with 352 undergraduate students from two upper level business courses. They divided the students into three groups: face-to-face, computer-mediated, and video-mediated and had them solve social dilemma scenarios. They learned that media richness does improve virtual communication and can help to build trust among team member. Group members who could

visually see the other team members' nonverbal and social cues had more trust with their group than the CMC group. Although they also observed that, "Video-mediated communication solves some, but not all, of the problems inherent when interacting via communication technology" (2008, p.106). These researchers showed that media richness in virtual communication is key to success but still no replacement for face-to-face communication.

Purvanova and Bono in their 2009 study found that transformational leadership is linked to project satisfaction but also learned that ftf is superior to CMC and it takes longer than ftf (p. 344). They created 118 virtual teams and 115 face-to-face teams out of undergraduates taking a psychology course at a public university and discovered six successful behaviors for virtual leaders such as: "establish trust, ensure team members feel understood and appreciated, manage virtual meetings and monitor team progress, enhance the external visibility of team members and ensure members benefit from participating in group" (p. 347). While in Johnson, Bettenhausen, & Gibbons, 2009 study observed that members using CMC ninety percent of the time experienced a less positive affect while working with their teams (p. 623). Then, Markman's conversational analysis study looked at the use of chat rooms by undergraduates in virtual meetings and how it effected the opening and closing of the meetings and observed that the use of that disrupted the flow of communication. In this study, "What is less well-developed within the virtual teams literature is a more detailed explanation of exactly how, at the most basic level, communication is coordinated in CMC" (2009, p. 151). This analysis included current concerns related to the importance of communication in virtual organizations such as problems with the technology design and miscommunication issues. They also discovered that, "Because actions are not tightly coupled with talk, they can take much longer to accomplish in virtual meetings than they would in face-to-face meetings or even telephone conferences" (p. 165). Nine years

later most of the virtual communication taking place in the workplace and in virtual research is text-based with little or no attention being given to more visual technology even though most of the research had pointed to the need for using technology that engaged more of the senses.

In 2010, the focus of virtual research moved away from just looking at the technology and started to analyze the virtual worker versus the collocated worker. Lojeski and Reilly used a linear model to measure the link between virtual distance and critical success factors by looking at physical distance, operational distance and affinity distance, which resulted in a Virtual Distance Index. (Lojeski & Reilly, p. 51, 2010) The same pattern of factors that effect successful virtual communication are also important indicators in the virtual distance index such as trust levels, innovative behavior, organizational citizenship, satisfaction in participation and a shared vision for the project (p. 52-53). They found that three key factors effect virtual distance including: Physical Distance (Organizational, Temporal, and Geographic); Operational Distance (Distribution, Readiness, Multitasking, Communication Distance); and Affinity Distance (Interdependence Distance, Relationship Distance, Social, and Cultural). What the researchers learned was that you did not have to be a virtual worker to feel isolated from the organization and that collocated workers used virtual communication to increase virtual distance when desired. O’Leary, M.B, Wilson, J.M. & Metiu 2014 study agreed and found that perceived proximity and not physical proximity affects relationship quality in an international survey of more than six hundred people (p. 1219). “We found strong similarities between dispersed and collocated colleagues’ perceptions of proximity, communication frequency, and identification” (p.1235). In other words, the virtual distance or perceptions of proximity are more psychological based than geographically based. Several respondents reported that although they worked in the same building with some team members, they used technology to distance themselves from these

workers. Then, used that same technology to keep in touch with other workers located in other countries.

Another study by Fonner & Roloff, “examines the extent to which telework affects job satisfaction through the experiences of work-life conflict, and found that high-intensity teleworkers are more satisfied than office-based employees and achieve significant benefits from their work arrangement, with work-life conflict most influential toward job satisfaction” (2010, p. 336). This analysis concurred with AAKirman and Harris study from five years earlier that showed higher satisfaction among virtual worker than collocated workers. Fonner & Roloff found that teleworkers had more autonomy and that it helped with diminishing the conflict between personal life and work life by reducing stress from meetings, interruptions, and distractions (p. 340). The study looked at a small sample of 89 teleworkers and 103 office-based employees who took a self-selected survey regarding job satisfaction. This research did find that less face-to-face interaction was not detrimental to job satisfaction because teleworkers have more control over their work environment (p. 358). Thus, teleworkers appear to be as satisfied as they were five years earlier. Heller also observed that, “Although virtual communication offers many advantages, it is not without challenges” (2010, p. 9). For example cost saving of travel for ftf meetings and the ability to keep in regular contact using multi-channels during a project. However, CMC or virtual communication also generates many interpersonal challenges such the absence of non-verbal cues and transferring tacit knowledge (p. 11).

The same issues keep coming up such as difficulty building trust with other group members because members do not know each other and have never met or time issues when synchronous virtual communication is used (video conferencing, phone calls or live chats). Also cultural barriers are compounded and technology breakdowns and delays occur on a regular

basis. Heller suggested several strategies for improving virtual communication such as strong leadership with clear team vision that actively managed the team by cultivating relationships through limited communication. In addition, managers need a strong understanding of cultural differences and should build trust through early ftf meetings as well as help members see their individual benefit. She specifically identified setting regular communication routines weekly while rotating time for cross time zone meetings thus creating shared norms and goals. Finally, successful virtual communication must use multiple technology tools based on the task and train the team on the technology and programs. “By creating a balanced scorecard with objective measures, increasing the flow of virtual team information, and capitalizing on alternative sources of information when assessing team and individual performance, managers have the means by which to combat the virtual communication challenges” (Heller, 2010, p. 72). After critically analyzing ten years of virtual studies, a definite pattern is beginning to emerge as well as strategies of how to manage virtual communication and yet not much has changed in these studies findings. The majority of virtual research in the workplace was still text based or CMC and the same problems kept happening such as miscommunication because of limited non-verbal communication (facial expressions, gestures, etc.). This is difficult to believe since Facebook was five years old at this point, Twitter had begun in 2009 and Instagram had started in 2010.

One would think at this point virtual research would start to focus on the use of more visual or social media and its application to business communication. However, the research continued to center on how communication technology could replace ftf meetings or the actual collocated workplace. For instance Berry’s study found “managing virtual teams is different and more complex than managing face-to-face teams” even though they share many elements of face-to-face teams (2011, p. 186). Virtual teams go through the same forming, norming and

performing stages but the storming stage is often skipped or blended into other stages (p. 191). This can lead to groupthink and conflict throughout the group's work. Virtual teams are more prone to conflict because the members may not really know each other very well and it takes much more time to build these relationships in the virtual environment (p. 195). The advantages of virtual team's are bridging time and space but the team still needs to have well selected team members and leadership and systematic communication since most of the communication is asynchronous. Berry stresses making sure the group's goal and purpose are clear and measurable, which is just as vital to the success of face-to-face groups. This study finds for every advantage to virtual teams there are disadvantages and that virtual groups face the same challenges as face-to-face groups but need to work more systematically at building social relationships among group members to help virtual teams succeed. As he states, "The effective management of virtual teams requires knowledge and understanding of the fundamental principles of team dynamics regardless of the time, space, and communication differences between virtual and face-to-face work environments" (p. 186). While Berry analyzed how virtual teams evolved or did not evolve through group stages other researchers concentrated on how virtual members built interpersonal relationships. Virolainen 2011 study collected data from 10 different virtual teams through a thematic interview and questionnaire. The results showed that a virtual working environment decreases informal personal communication, which affects social relationships between co-workers. However, results did show that building close social relationships between co-workers in the virtual work context is possible but meeting face-to-face was key to helping build them. 44% of the subjects already had personal relationships and despite a large group of virtual members knowing each other the computer-mediated communication was a continual struggle (p. 577-578). This study found that virtual team

members needed to start building a personal bond with other group members before the project began and even with prior knowledge of other members communicating virtually was a challenge.

In 2012 Denstadli, Julsrud and Hjorthol's quantitative study came to similar conclusions as Berry and Virolainen studies regarding virtual team members socially bonding. They observed that video-conferencing and ftf meetings differ along several dimensions, suggesting that these two modes of communication fulfill slightly different needs. The researchers proposed a framework to understand the emerging role of video-conferencing, which addressed both relational and task-based dimensions (p. 65). Video-conferencing can reduce stress due to travel, reduce environmental strain, and save time, but the main disadvantages is it is not suitable for meetings between participants who do not know one another and that it makes developing contacts difficult (p. 80). That same year, Golnaz Sadri and John Condia research identified the keys to success for both face-to-face and virtual teams as: high levels of trust, open and clear communication, strong leadership, clear goals and purpose and the use of appropriate levels of technology. "In 2007, IBM estimated that it saved more than \$50 million in travel-related expenses by using virtual teams" (2012, p. 21-22). However, poor technical and communication skills as well as members cultural differences and inability to work remotely can hinder productivity of virtual teams. "Since individuals tend to be less inhibited when communicating technologically, virtual team communication has the potential to become harsh and provoke conflict" (p. 24). Thus modeling proper communication is vital when dealing with conflicts that arise. Virtual teams need to have their members and leadership carefully selected and creates regular and predictable communication to build trust. Researchers Golnz Sadri and John Condia agree that, "Members of high-performing teams have high levels of trust in one another" (p. 24).

Palos 2012 study also agreed with many earlier research that, “The process of communication is infinitely more complex in virtual teams and virtual organizations” (p. 38). “The issue of trust arises because of the characteristics of the communication process – the lack of or very few face-to-face meetings and the cultural diversity that is manifested in the manner of addressing of the partners from different geographical regions” (p. 41). It is obvious that after 12 years of virtual studies building trust is directly linked to communication and how well that virtual communication is managed as well as maintained.

In 2013 researchers started to analyze more cutting edge communication technology, Cyphert, Wurtz and Duclos study looked at how business organizations used virtual worlds in traditional organizations and found that the communication requires much more examination and modification. They learned as others have that it is a useful tool when used with other communication tools such as social media, and face-to-face. Companies such as Cisco and IBM were early users of public virtual worlds but have since moved in-house to create more secure and customizable virtual environments (Cyphert, Wurtz and Duclos, 2013, p. 350). Sun Microsystems incorporates also moved to using more social media tools (Barker, 2008). “Now, an employer can choose among a range of social media, including Facebook, LinkedIn, podcasts, Twitter, wikis, as well as various methods of virtual interaction” (Cyphert, Wurtz and Duclos, 2013, p. 350). In Weimann, Pollack, Scott, and Brown 2013 study the focus had shifted to virtualness as a characteristic present in all teams. It was found that restrictions in Internet access of even a single member within a team limited the team’s technological choices, and affected the team’s performance (p. 332). “Technologies, such as groupware, videoconferencing, mobile phones, and the internet, all support the work of teams. Communication is at the heart of distributed and traditional project teams; and many issues faced by virtual teams, such as conflict

management as well as trust and team cohesion, are rooted in team communication behaviors and processes” (p. 336). Just as many studies before, they found that trust must be established and maintained through the proper selection and use of virtual communication technology tools. Next, the team’s progress should be monitored regularly through the chosen technology and team members made visible and shown the benefits of working on a virtual team. Even as the communication technology choices grew in business communication, virtual research kept finding that virtual groups encountered the same issues with some minor improvements when communication was managed properly.

Ruppel, Baiyun, G., & Tworoger in 2013 analyzed the perspectives of U.S. managers who teleworked from domestic workplaces and virtual team members located in offices in India and found that “managers chose media that met task requirements and maintained the boundaries between their work and personal lives rather than media that would provide the most satisfactory experience” (p.437). This case study looked at a nine member virtual team of managers and workers from a Fortune 100 multinational corporation and observed the virtual team select media based on the people involved and their relationships not just the assigned task (p.441). The virtual managers choose their communication tools based on the size, subject matter, and makeup of the audience, thus instant messaging, email and talking on the phone were the tools used most of the time during the project (p. 451). These researchers have learned as many others have that the more virtual the workplace becomes the more complex the issues such as managing temporal, cultural, geographical, language, work-life boundaries as well as communication. It appears from this study that even though the virtual team was very successful the members from India would have liked more ftf interaction to better bridge the cultural divide. “Consequently, miscommunications occurred, leading to missed deadlines and lost productivity that could have

possibly been avoided if the team members had initially met face-to-face in order to establish team protocols and build relationships and mutual understanding” (p. 463).

In 2014 Bartelt and Dennis conducted an experimental study to examine the impact of different genre rules developed for two communication tools: instant messenger and discussion forum. Their results show that these tools triggered different genre rules with different behaviors, which in turn resulted in significantly different decision quality. These findings suggested that the automatic enactment of genre rules for a communication tool had as powerful an effect on behavior and performance as the actual features of the tool itself. They believed that the results, taken together with past research showed the effects of social structures on communication, and called for “the expansion of task–technology fit theories to include the role of social structures in explaining the use of and performance from communication tools” (2014, p. 521). Their research supported McLuhan’s “the medium is the message” work and the thousands of other studies that followed by showing that how virtual group members use virtual tools such as discussion boards and instant messaging directly affects the message. Thus affecting the success of the group reaching their goal. This empirical study analyzed “virtual team’s effectiveness, their communication strategies and the team’s psychological traits: trust, shared understanding and co-operation and found the limited range of communication methods available to a global virtual team was not a major contributing factor to a team’s effectiveness” (Morgan, Paucer-Caceres & Wright, 2014, p. 607). However, they also found that as virtuality grew in the different groups their need for routine and constant communication was necessary to reach their goals successfully. Researchers Morgan, Paucer-Caceres & Wright also found that “misunderstandings and misinterpretations occur frequently, but this can be overcome through a mixed methods approach to communicating - verbal, face-to-face and written” (2014, p. 613). Virtual team

effectiveness is linked to the communication process and the need for group members to bond and build relationships, which builds trust and improves virtual groups productivity. This study found that it was not necessarily the mode of communication as much as it was the regular process of communicating with your group members.

As the number of virtual studies grew it is interesting to note that many results showed that most business communicators were still using traditional technology to virtually communicate. For instance, Kiddie's 2014 survey found that "Email, face-to-face meetings, and telephone calls are preferred choices for workplace communication as well as for personal communication although text-messaging did receive a significant increase in personal communication (p. 78). It should be noted the study is based on a 26-question survey distributed back in 2010 only a year after Twitter came into existence. In 2010 email and electronic calendars were preferred over texting at work. "Employees were relying more on instant messaging, email, and text messaging to communicate with colleagues asynchronously while at work" (p. 66). Most of the virtual communication taking place in the workplace in 2014 still centered on text-based communication. Respondents to the survey believed that, "A successful next generation messaging system will combine SMS, instant messaging, video conferencing, and email into one seamless platform" (p. 68). "The author concludes that change agents and early adopters already in the company, not new hires, will effect a change in communication media that will involve new technology such as smartphones" (p. 65). Almost ten years since the birth of Face Book and with the explosion of social media, business communication was still text-based with more people texting, blogging, and using email. Darics 2014 study found through linguistic analysis new communicative situations requires rethinking of previously existing interactional norms and communicative practices employed by the team members are not yet

conventionalized. The growing success of virtual teams is due to the confluence of organizational and technological factors, as well as financial benefits (p. 337). Their study disclosed that the success of virtual teams boiled down to saving the company money not necessarily the quality of the project. A few studies did analyze business use of total virtual environment; a Lohle & Terrell qualitative study analyzed how avatars had an impact on trust and potential project management success when teams used virtual worlds to collaborate (2014, p. 1). Their study observed multiple issues with the avatars realistically representing the person with miscommunication of facial expressions and gestures. Virtual team members only trusted their colleagues after confirming they could rely on them to deliver and once they verified their colleague's virtual self was authentic (p. 7).

The most comprehensive study conducted on virtual teams was Gilson, Maynard, Jones Young, Vartiainen, and Hakonen 2015 review of empirical studies conducted over the last ten years. They found that technology can impair virtual teams and is key to enabling communication and performance monitoring. Trust is one of the most studied variables in virtual team literature and trust is influenced by communication behaviors such as timely responses, open communication and feedback (p. 1321). Early communication and trust in technology are important elements to successful virtual groups. The researchers learned that virtual competence and generational impact also need to be studied over time to allow for better assessment because millennials will be better at virtual teams since they are more comfortable using CMC to reduce boundaries (p. 1324-1325). The majority of virtual team studies focused on email, chat rooms and discussion boards and their study observed that there is a need for the research to look at new and emerging technology such as social media. (p. 1318). The Cardon & Marshall study did just that by surveying 227 business professionals about their, "use of social networking for team

communication compared to other communication channels, perceived effectiveness of social networking tools for team communication compared to other communication channels” (2015, p. 273). The results showed that traditional communication channels are used more commonly and considered more effective for team communication. However, younger generations did see social media as the future tool for business communication. The authors believe social media has taken over email as the primary source of personal communication but email still dominates in the workplace (p. 274). According to Cardon & Marshall’s survey “Across all generational groups, face-to-face meetings, in-person conversations, e-mail, and phone calls are considered the most effective communication tools” (p. 284). Even in companies that use and promote the use of social media, these traditional tools are still considered the most effective. The authors concluded that this technology would become more a part of business communication over the next 5-10 years. A great deal of these virtual studies keep pointing to the fact that a media rich environment with multiple communication tools in use could be the answer to the successful use of virtual communication in the workplace (Mitchell, 2015).

Discussion

After reviewing hundreds of studies and focusing on forty studies where virtual communication played a key role, several issues that impact the success of managing virtual communication have become quite evident. In 15 years of virtual research the majority of the studies analyzed traditional communication technology being used in business communication such as email, texting, chat, and phone calling. These studies tended to focus more on the text-based virtual communication because it is the technology that businesses and workers reported they used the most when communicating at work. A few studies did look into the use of video

conferencing and briefly discussed the use of social media, but for the most part virtual business communication has been text-based. This has led many researchers to similar findings on the success and failure of virtual teams and their use of virtual communication. The same problems of building trust, keeping the virtual team members engaged in the process, dealing with cultural as well as time differences, routine communication and overcoming technical breakdowns were consistently encountered in almost all of the forty studies analyzed. Many of the researchers identified these problems and suggested solutions such as, Kirkman, Rosen, Gibson, Tesluk & McPherson study which conducted “a comprehensive set of interviews with team leaders, general managers and executives on 65 virtual teams at Sabre, Inc., a travel industry company” (2004, p. 67). Over 13 years ago these researchers identified five challenges that virtual teams need to overcome to be successful which includes: building trust, cohesion, team identity, balancing technical and interpersonal skills, and assessment and recognition of team performance. This study as the many studies that have followed discovered that the lack of face-to-face time for team members made social bonding much more difficult and thus virtual team members must establish trust based on routine virtual communication. Such as short, frequent communications with purpose, which helps remote employees to feel connected and included (Janove, 2004)

In his 2013 Harvard Business Review article, Michael Watkins agrees with Kirkman’s findings as well as several other studies that face-to-face meetings in the beginning are vital so is communication mode, choice of technology, and virtual water coolers so groups can bond and get to know each other. Communication on virtual teams is often less frequent, and is always less rich than face-to-face interaction and communication guidelines must be set up and enforced for success to happen. A 2014 Cornell Study also found that meeting face-to-face is key early on, so is setting up ground

rules for communication mode, shared software interface is a must and picking the correct technology based on tasks is vital to that success. These current studies support other research that can be traced back to studies conducted in 2002 by Rutkowski, Vogel, Genuchten, Bemelmans, & Favier as well as Kirkman, Rosen, Gibson, Tesluk & McPherson. Rutkowski et al found that continuous communication is required to avoid confrontation and resolve conflict. These researchers believed in applying a sandwich structure with virtual teams by kicking off the team with ftf meetings to build trust, creating and sticking to an agenda, ending with the closure, and delivering a final product preferably done ftf (p. 227). The researchers developed a six-week project involving hundreds of people from different cultures and focused on the “importance of structuring activities for balancing electronic communication during e-collaborations such as video conferencing, email, and chat sessions” (p. 219). They also found that early synchronous work and timely feedback were critical for virtual groups to succeed. As early as 2001 Duarte and Snyder developed a communication plan for virtual teams which included: access to the power structure, managing horizontal interfaces, provide teams with access to important information and establish accountability for data collection and information sharing (p. 108). These researchers identified the importance of regular free flowing communication between virtual group members and other stakeholders in the process as key to the success of the team’s work. They also recognized the importance of accountability for virtual workers’ roles, which can make or break the success of a virtual team. However, Duarte and Snyder’s communication plan is missing a key element named in a majority of the forty studies analyzed and that is without trust very little virtual work let alone communication succeeds.

Thus, businesses that want to successfully use virtual communication at work must include some form of a ftf meeting early on or at the very least allow workers to bond before

projects begin using more visual technology such as video-conferencing or Skype. As these virtual studies have shown people tend to trust quicker and deeper when they have actually seen and heard the other person. This is due to the fact that 80% or more of communication is nonverbal. Businesses that have been relying on text-based virtual communication have increased miscommunication among workers not improved it, which is why the media richness of the business communication used is vital to the success of virtual communication in the workplace. After building trust by meeting ftf or using more visual media to converse the research also pointed out a need to set clear communication ground rules for when and how long virtual workers/teams communicate. Researchers consistently reported that some virtual workers/teams could become slackers or drift when there was no weekly routine for members to communicate (Isaacs, Walendowski, Whittaker, Schiano, & Kamm, 2002; Lojeski and Reilly, 2010; Morgan, Paucer-Caceres & Wright, 2014). In other words, successful virtual communicators exchange information on a regular basis for a certain amount of time at least one to two times a week if not more depending on the project deadline.

In addition to building trust and setting clear communication guidelines, organizations need a shared technology interface that all workers have been properly trained on so time is not wasted with people trying to learn the software at the same time they are trying to virtually communicate. This only causes delays in communication, which leads to frustration and more miscommunication among workers both collocated and virtual. The interface that is being utilized by the organization should be made easy to use since there will be people using it from varying levels of technology expertise from novice to professional. Another element that greatly impacts virtual communication is the communication channels selected to communicate virtually. Almost all of the studies found that the communication channels used should be based

on the task, which means virtual work requires the use of multiple communication channels (Darics, 2014; House, 2007; May & Margolis, 2006). Just as some people are visual or verbal learners the same can be said about how people communicate, which is why it is so important to use more than one communication channel when virtually communicating at work. Many of the studies found that business were using at least three different communication channels even if they were mostly text-based such as email, instant messaging, live chats and phone calls. More and more businesses are using video-conferencing and this does help improve non-verbal communication depending on if workers can see each other's facial expressions and gestures.

Therefore, the virtual research suggests a minimum of two weeks before virtual communication begins on a project, the group needs to become more socially grounded by either meeting face-to-face or by taking part in virtual water cooler communication so workers can bond with their group (Akkirmann & Harris, 2005; Duckworth, 2008). The researchers also suggest using richer media especially voice and video technology and that using this richer media helps to build trust and trust helps make virtual communication successful (Argenti, 2006; Berry, 2011; Bartelt & Dennis, 2014). Furthermore, a variety of communication channels must be used to avoid miscommunication and should be selected based on the task at hand (House, 2007; Gilson, Maynard, Jones Young, Vartiainen & Hakonen, 2015). Finally, virtual communication cannot be successful if workers are silent or not very responsive so regular and consistent communication must take place and each worker needs to be accountable for their communication effort (Heller, 2010; Kidde, 2014; Markman, 2009). A rubric that can measure the proper use of these suggestions is needed in order to acquire the ability to measure the success or failure of virtual communication in the workplace.

Instrument

A measurement device was developed to evaluate the success of the four areas/criteria that impact virtual communication as identified in the analysis of the virtual studies. The Virtual Communication Evaluation Instrument analyzes trust-building, routine communication, media richness, and accountability. The device can be used to critically review a project or an employee that is using virtual communication in the workplace. If an employee is being evaluated the job title will also be recorded. The entire instrument is based on a 100-point scale with each area worth 25 points apiece. There are five sub-areas for each main area analyzed valued at five points a piece. The five point scale ranks each sub area's performance as 5 = excellence, 4 = Good, 3 = average, 2 = poor, and 1 = failure. The assessment is based on an expert applying the device and identifying if each area is functioning well or if problems are being encountered and how these difficulties are being addressed to resolve the problems or if the issues are not being addressed. Once the instrument is applied and the subject or project has been analyzed, it is scored and a final total is given a value with suggestions on how to improve virtual communication, which in turn will improve the ranking on the VCE (Virtual Communication Evaluation) scale. The VCE levels are: Extremely Successful: 100-90 - Virtual Communication flowed well with little to no miscommunication and goals were met with high employee satisfaction; Successful: 89-80 - Virtual Communication flowed well with some miscommunication but goals were met with employee satisfaction; Moderately Successful: 79-70 - Virtual Communication had several issues with miscommunication but goals were still met with some employee satisfaction; Unsuccessful: 69-60 - Virtual Communication had several major issues with miscommunication and goals were not met, little or no employee satisfaction; Failure: 59 and below - Virtual Communication had total communication breakdown and goals were not met, little or no employee satisfaction. The final element of the instrument is a

comment section where a trained expert can make suggestions for the subject or subjects being analyzed. The expert will physically go to the organization or employee's location and observe them at work using virtual communication and administer the device. In essence, a field study will occur and the VCE applied and then the expert will meet with their subjects to advise them on how to improve or keep successfully virtually communicating.

The four main criteria analyzed in this instrument are broken down into sub-areas, which were also consistently identified in the virtual studies as criteria that need to be properly managed in order to help build trust through routine communication using more media richness and ensuring engagement through accountability. The first main criteria critically reviewed in the device is trust building, which was the number one problematic issue mentioned in a majority of the research (Berry, 2011; Denstadli, Julsrud & Hjorthol, 2012; Duckworth, 2008; Fønner & Roloff, 2010; Johnson, Bettenhausen & Gibbons, 2009; Palos, 2012; Virolainen, 2011). The five sub-areas that may improve or impede trust building are: Pre-Work, face-to-face/video conferencing, CMC, bonding and culture. A majority of the studies discussed the importance of employees and groups getting to know each other before actually working together. Many suggestions were made from creating informal virtual exercises that created a virtual water cooler environment to having employees call, text, or email one another so when they begin work they are not total strangers. This part of the instrument will help the expert to identify if any effort is being made on the pre-work area and observe if it is building trust or not. The second sub-area is face-to-face/video conferencing, which was another issue continually discussed in the virtual studies. Researchers have found that having employees or groups meet early in their work process together is vital to building trust and that if ftf is not possible at the very least video conferencing must be used to build trust. People do not trust as easily when they

have not seen the other person they are working with and it takes much longer to build trust, which can delay work productivity. The expert will observe if this issue is addressed or not and analyze how it is effecting the virtual communication process. The third sub-area looks into the use of CMC or all the non-visual communication-taking place and identifies if at least three forms are being utilized. The research suggested that at least three modes of CMC should be used when communicating virtually such as texting, emailing, and phone calls. The fourth sub-area the device is analyzing is bonding. The expert will try to identify if employees have created relationships with each other to the point that they have bonded. This can be uncovered by looking at the type of language being used between employees, (is it casual or more formal) as well as how the employee's over all demeanor is when communicating with this person. The fifth and final sub-area under trust building is culture. There are two kinds of culture that impact virtual communication, the first is the organization's culture and the second is intercultural. Each organization has a culture that can be highly structured or less and may empower managers or the employees or perhaps both or neither. Organization are also made up of employees from different countries as well as from different regions of various countries and each culture has a distinct way of communicating in addition to speaking different languages. It is vital that organizations understand the various cultures interacting in their workplace and that employees are supported and aided in reaching across cultures to successfully communicate with one another. This can only be done when an effort is made for employees to get to know each other better and with training on cultural communication. If the expert using the VCE sees little or no effort being made to communicate cross culturally and the employees are a culturally diverse group a low score will be given. However, if the expert observes consistent efforts being made to be inclusive culturally the result will be a higher score in this sub-area.

The second main criteria the VCE instrument is routine communication (Bartelt & Dennis, 2014; Darics, 2014; Kidde, 2014; May & Margolis, 2006; Sobel-Lojeski & Reilly, 2008; Wong & Burton, 2000) with five sub-areas that include: weekly, bi-weekly, monthly, time of day, and time quantity. These sub areas are looking at if employees or groups are regularly communicating and is this routine communication every week or every two weeks or every month. If the expert sees that the virtual communication is every week then all three sub-areas will be scored at the same time and the quality of that communication will be measured by the last two sub-areas, which are time of day and time quantity. Time of day will evaluate if the employee or group are making an effort to routinely virtually communicate by rotating the time of day they virtually meet to accommodate employees in different time zones. The time quantity sub-area analyzes if the employee or group are spending enough time with each other to successfully complete the work. In other words, is the virtual communication brief with little information exchanged or do they spend several hours exchanging in depth information with substance.

The third main criterion analyzed on the VCE is media richness, which refers to the type of communication technology being used to virtually communicate (Argenti, 2006; Cyphert, Wurtz & Duclos, 2013; Dineen, 2005; Reinsch & Warisse-Turner, 2006; Ruppel, Baiyun & Tworoger, 2013; Warisse-Turner & Reinsch, 2007; Weimann, Pollack, Scott & Brown, 2013). The five sub-areas are text-based, phone, video, social, and technology interface. The virtual research findings suggest that the type of task be used as a guide in choosing which media by utilized to virtually communicate for a project or meeting. For example, using email or Google doc or live chats or all three to build a report by sharing the data. Another example might be using video conferencing, phone calls and Adobe Connect to work on a global presentation by

employees or a team. Text-based technology refers to texting, chats, email, blogs, wikis, or communication that uses text as the main source to share information. Phone technology is using phones to verbally speak to one or more people, while video technology is using the phone or computer to visually and verbally share information with other people. Social technology refers to using social media such as Facebook, Twitter, and Instagram to communicate with other people at work. Finally, the expert will also look at the technology interface to see if it is easy for employees to use or more complex requiring employees to train to properly use it. This part of the instrument is designed to help the expert decode if the proper technology is being utilized and if employees are successfully virtually communicating through both software and hardware.

The fourth and final main criterion analyzed with the Virtual Communication Evaluation Instrument is accountability (Akkirman & Harris, 2005; Baltes, Dickson, Sherman, Bauer & LaGanke, 2002; Duarte & Snyder, 2001; Fonner & Roloff, 2010; Markman, 2009; Morgan, Paucer-Cacere & Wright, 2014; Thompson & Coovert, 2003). Many of the virtual studies discussed the problems of keeping employees engaged in virtual communication and the negative impact that occurred when employees or virtual teams did not see the communication process as a key element to success. This is why the instrument analyzes participation, communication role, productivity, goals met, and feedback. Participation is defined as employees or teams actively taking part in the communication process by using the virtual technology to consistently share information. Communication role refers to the role or roles the employee is playing in the communication process such as leading the discussion, being a gatekeeper, contributing information, gathering information, etc. Productivity is defined as an end product or result of some kind that comes from the employee or group that is working virtually. This end product could be reaching a benchmark of a project or the end result of the entire project. The

fourth sub-area of accountability is have the goals been met. In other words, is the employee or group meeting or not meeting the goals that have been previously set. These goals include the business goals set and communication goals set by superiors. For instance, a team of employees may have set a communication goal to complete a report using email, texting and phone calling, while the final report is the business goal, which was assigned by supervisors to be completed by a certain deadline. The final sub-area is feedback, which refers to employees being required to give and receive feedback on their virtual communication. According to the virtual research feedback is vital to the success of virtual communication because it confirms if the communication was successfully shared with other employees or not. The expert is analyzing if employees or teams are using a communication plan that actively makes the members account for their part in the virtual communication process and if they are not what steps are being taken to improve the communication such as rewards and discipline. For example, if an employee is being highly accountable for their communication, then are they being rewarded for their efforts with praise or a bonus? Further, if an employee is not being very accountable for their communication, then are they being disciplined by losing a privilege or a bonus?

Limitations

This study has its limitations, which include only one researcher critically reviewing and selecting the studies. It would have strengthened the findings to have several researchers critically analyzing the virtual studies. This is why I developed a rubric/coding instrument that can be applied by more than one person in a business setting for future research and make the findings more rigorous. Most of the studies came from multiple journals because there was not enough data on virtual communication in business communication journals to properly analyze trends and issues. Hopefully, as the research area grows more data will become available for

future analysis.

Suggestions for Future Studies

The field of business communication must expand their research focus to analyzing the use of more visual media and social media such as the use of Skype, Face Book, Twitter, Instagram, Adobe Connect, and GoToMeeting. Researchers need to study how using these more media rich technology is impacting the productivity of workers and organizations. In addition, more rigorous analysis must be conducted from experimental to more field studies at small and large businesses to ensure more accurate findings that can help improve business communication practices. We need to look into multiple organizations and how they are using virtual communication from the health to education to government to the private sector. Perhaps subject matter effects how virtual communication should be utilized but very little is know at this time regarding this topic. I plan on conducting a second study using the rubric I have developed from this study to analyze if businesses from various fields are successfully using virtual communication in the workplace or not. In other words, are any consistent practices in the utilization of virtual communication across various fields?

Conclusion

After reviewing hundreds of virtual research studies and analyzing forty where virtual communication played a key role, a definite pattern of four areas impacting the success or failure of virtual communication emerged. I have identified four issues (trust-building, routine communication, media richness, and accountability) that consistently effect virtual communication in the workplace. The research clearly shows that if these areas are not properly managed the communication fails and so does the project and/or employee. Thus businesses need to focus on these areas more and actively work on fixing the communication breakdowns that

can impede success. It is vital to identify the problems because you cannot fix something that has not been acknowledge and identifying the problems in these four areas will help businesses improve their virtual communication, which will improve the businesses results. The goal of this study was to identify the “success criteria” used in successful virtual communication. By uncovering the impact that these four areas have on virtual communication and identifying the criteria that make up each of the sub-areas I have completed that objective by developing the Virtual Communication Evaluation Instrument. It not only identifies the “successful criteria” but also measures the success of the virtual communication and provides feedback for organizations using virtual communication in the workplace. Virtual communication can only be successful when these areas are consistently addressed and the criteria managed.

References

- Akkirman, A.D. & Harris, D. (2005) Organizational communication satisfaction in the virtual workplace, *Journal of Management Development*, 24(5), 397 – 409.
- Andres, H.P. (2012) Technology-mediated collaboration, shared mental model and task performance. *Journal of Organizational and End User Computing*, 24: 64-81.
- Argenti, P.A. (2006) How Technology has influenced the field of corporate communication. *Journal of Business and Technical Communication*, 20(3) 357-370.
- Barker, P. (2008) How social media is transforming employee communications at Sun Microsystems. *Global Business and Organizational Excellence*, 27(4), 6-14.
- Baltes, B. B., Dickson, M. W., Sherman, M. P., Bauer, C. C., & LaGanke, J. S. (2002) Computer-mediated communication and group decision-making: A meta-analysis. *Organizational Behavior & Human Decision Processes*, 87(1), 156-179.
- Bartelt, V. & Dennis, A. (2014) Nature and nurture: The Impact of automaticity and the structure or communication on virtual team behavior and performance. *MIS Quarterly*, 38(2), 521-538.
- Berry, G. R. (2011) Enhancing effectiveness on virtual teams: Understanding Why Traditional Team Skills Are Insufficient. *Journal of Business Communication*, 48(2), 186-206.
DOI: 10.1177/0021943610397270
- Cameron, A. F., & Webster, J. (2005) Unintended consequences of emerging communication technologies: Instant messaging in the workplace. *Computers in Human Behavior*, 21, 85–103.
- Cardon, P.W. & Marshall, J. (2015) The Hype and reality of social media use for work

- collaboration and team communication. *International Journal of Business Communication*, 52(3) 273–293.
- Cornell University Study on Global Teams, *conducted for the Cornell Center for Advanced Human Resource Studies (CAHRS) Spring 2010 Partner Meeting*, May 6, 2010, New, NY. 1-100.
- Cornelius, C., & Boos, M. (2003) Enhancing mutual understanding in synchronous computer mediated communication by training. *Communication Research*, 30, 147–177.
- Cyphert, D., Wurtz, S.M., & Duclos, L.K. (2013) Curricular Implications of Virtual World Technology: A Review of Business Applications, *Business Communication Quarterly*, 76(3) 339–360.
- Darics, E. (2014) The Blurring Boundaries Between Synchronicity and Asynchronicity: New Communicative Situations in Work-Related Instant Messaging, *International Journal of Business Communication* 51(4) 337–358.
- Dineen, B. R. (2005) TeamXchange: A Team project experience involving virtual teams and fluid team membership. *Journal of Management Education*, 29(4), 593-616.
- Denstadli, J.M., Julsrud, T.E., and Hjorthol, R.J. (2012) Videoconferencing as a Mode of Communication: A Comparative Study of the Use of Videoconferencing and Face-to-Face Meetings, *Journal of Business and Technical Communication*, 26(1), 65-91.
- De Pillis, E., & Furumo, K. (2007) Counting the Costs of Virtual Teams. *Communication of the ACM*, 50(12), 93-95.
- Dietz-Uhler, B., & Bishop-Clark, C. (2001) The use of computer-mediated communication to enhance subsequent face-to-face discussions. *Computers in Human Behavior*, 17, 269–283.

- Duarte, D. L., & Snyder, N. T. (2001) *Mastering virtual teams: Strategies, tools, and techniques that succeed* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Duckworth, H. (2008) How TRW Automotive Helps Global Virtual Teams Perform at the Top of Their Game. Published online in Wiley InterScience: www.interscience.wiley.com, *Global Business and Organizational Excellence*, 6-16.
- Furst, S. A., Reeves, M., Rosen, B., & Blackburn, R. S. (2004) Managing the life cycle of virtual teams. *Academy of Management Executive*, 18(2), 6-20.
- Fonner, K.L., & Roloff, M.E., (2010) Why Teleworkers are more satisfied with Their Jobs than are Office-Based Workers: When Less Contact is Beneficial, *Journal of Applied Communication Research*, 38(4), 336-361.
- Gilson, Lucy, Maynard, M.T., Jones Young, N.C., Vartiainen, M., & Hakonen, M. (2015) Virtual Teams Research: 10 Years, 10 themes and 10 opportunities, *Journal of Management*, 41(5), 1313-1337.
- Heller, R. (2010) A cost-benefit analysis of face-to-face and virtual communication: overcoming the challenges, *conducted for the Cornell Center for Advanced Human Resource Studies (CAHRS) Spring 2010 Partner Meeting*, New Your, NY, 9-28.
- House, C.H. (2007) Building effective virtual teams. *Presentation at Stanford University, Media X Summer Institute*.
- Isaacs, E., Walendowski, A., Whittaker, S., Schiano, D. J., & Kamm, C. (2002) The character, functions, and styles of instant messaging in the workplace. In E. F. Churchill, J. McCarthy, C. Neuwirth, & T. Rodden (Chairs), *Proceedings of the 2002 ACM Conference on Computer Supported Cooperative Work* (pp. 11–20). New York: Association for Computing Machinery.

- Johnson, S. K., Bettenhausen, K. & Gibbons, E. (2009) Realities of working in virtual teams: Affective and attitudinal outcomes of using computer-mediated-communication. *Small Group Research*, 40(6), 623-649.
- Kidde, T.J. (2014) Text(ing) in context: the future of workplace communication in the United States. *Business and Professional Communication Quarterly*, 77(1) 65 –88.
- Kirkman, B.L., Rosen, B., Tesluk, P. E., & Gibson, C. B. (2004) The Impact of team empowerment on virtual team performance: the moderating role of face-to-face interaction. *Academy of Management Journal*, 47(2), 175-192.
- Lohle, M.F. & Terrell, S. R. (2014) Real Projects, Virtual Worlds: Coworkers, their Avatars, and the Trust Conundrum, *The Qualitative Report*, 19(15), 1-35.
<http://www.nova.edu/ssss/QR/QR19/lohle15.pdf>
- Lurey, J.S., & Raisinghani, M.S. (2000) An Empirical study of best practices in virtual teams. *Information and Management*, 19(1), 1-22.
- Majchrzak, A., Malhotra, A., Stamps, J., & Lipnack, J. (2004) Can absence make a team grow stronger? *Harvard Business Review*, 82(5), 131-137.
- Markman, K.R. (2009) So what shall we talk about? Openings and closings in chat-based virtual meetings. *Journal of Business Communication*, 46(1), 150-170
DOI: 10.1177/0021943608325751
- May, G.I. & Margolis, S. L., (2006) The “Dark Side” of online project teams: Challenges and remedies. *Paper presented at The Association for Business Communication Annual Convention*, San Antonio, Texas.
- Mitchell, R.N., (2015) The Correlation between virtual communication and employee engagement. *Dissertation at Walden University*,

<http://scholarworks.waldenu.edu/dissertations>.

- Morgan, L., Paucer-Caceres, A. & Wright, G. (2014) Leading effective global virtual teams: The Consequences of methods of communication. *System Practice Action Research*, 27, 607–624. DOI 10.1007/s11213-014-9315-2
- O’Leary, M.B, Wilson, J.M. & Metiu, A. (2014) Beyond being there: The Symbolic role of communication and identification in perceptions of proximity to geographically dispersed colleagues. *MIS Quarterly*, 38(4), 1219-1243.
- Palos, A.M. (2012) The information flow in virtual teams. *Journal of Advances Research in Management*. Vol. 3, Issue 1(5), 38-45.
- Pauleen, D. J., & Yoong, P. (2001) Facilitating virtual team relationships via Internet and conventional communication channels. *Internet Research*, 11, 190–202.
- Purvanova, R. K., & Bono, J. E. (2009) Transformational leadership in context: Face-to-face and virtual teams. *Leadership Quarterly*, 20(3), 343–357.
- Qureshi, S., Liu, M., & Vogel, D. (2006) The Effects of electronic collaboration in distributed project management. *Group Decision and Negotiation*, 15: 55-75.
- Reinsch, N. L., & Warisse-Turner, J. (2006) Ari, R U There? Reorienting business communication for a technological era. *Journal of Business and Technical Communication*, 20(3) 339-356.
- Rockmann, K.W., & Northcraft, G. B. (2008) To be or not to be trusted: The influence of media richness on defection and deception. *Organizational Behavior and Human Decision Processes*, 107, 106–122.
- Rutkowki, A. F., Vogel, D. R., Genuchten, M., Bemelmans, T, M., & Favier, M. (2002) E-Collaboration: The Reality of virtuality. *IEEE Transactions on Professional*

Communication, 45(4), 219-230.

Ruppel, C. P., Baiyun, G., & Tworoger, L.C. (2013) Using communication choices as a boundary-management strategy: How choices of communication media affect the work-life balance of teleworkers in a global virtual team. *Journal of Business and Technical Communication*, 27(4) 436-471.

Sadri, G. & Condia, J. (January/February 2012) Managing the virtual world. *Industrial Management*, 21-25.

Starke-Meyering, D. & Andrews, D. (2006) Building a shared virtual learning culture an International classroom partnership. *Business Communication Quarterly*, 69(1), 25-29.

Sobel-Lojeski, K. & Reilly, R.R. (2008) *Uniting the virtual workforce: Transforming leadership and innovation in the globally integrated enterprise*. Hoboken, NJ: Wiley & Sons, Inc.

Suh, A., Shin, K.S., Ahuja, M., & Kim, M.S. (2011) The Influence of virtuality on social networks within and across work groups: A multilevel approach. *Journal of Management Information Systems*, 28: 351-386.

Tavčar, J., Zavbi, R., Verlinden, J., & Duhovnik, J. (2005) Skills for effective communication and work in global product development teams. *Journal of Engineering Design*, 16, 557-576.

Thompson, L. F., & Covert, M. D. (2003) Teamwork online: The effects of computer conferencing on perceived confusion, satisfaction and post discussion accuracy. *Group Dynamics: Theory, Research, and Practice*, 7, 135. doi:10.1037/1089-2699.7.2.135

Virolainen, H. (2011) Familiarity and social relationships between members of virtual teams, *Global Conference on Business and Finance Proceedings*, 6(2), 577-581.

- Watkins, M. (June 27, 2013) Making virtual teams work: Ten basic principles. *Harvard Business Review*, <https://hbr.org/2013/06/making-virtual-teams-work-ten/>
- Warisse-Turner, J., & Reinsch, N. L. (2007) The Business Communicator as presence allocator: Multicommunicating, equivocality, and status at work. *Journal of Business Communication*, 44(1) 36-58.
- Weimann, P., Hinz, C., Scott, E., & Pollock, M. (2010) Changing the Communication Culture of Distributed Teams in a World Where Communication is Neither Perfect nor Complete. *The Electronic Journal Information Systems Evaluation*, 13(2), 187 – 196.
- Weimann, P., Pollack, M., Scott, E. & Brown, I. Enhancing (2013) Team performance through tool use: How critical technology-related issues influence the performance of virtual project teams. *IEEE Transaction on Professional Communication*, 56(4), 332-353.
- Wong, S., & Burton, R.M. (2000) Virtual Teams: what are their characteristics, and impact on team performance. *Computational & Mathematical Organization Theory*, 6(4), 339-360.

Online Commerce as a Digital Literacy: A Grounded Theory Approach

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Abstract

We present a framework to account for the ways readers gather, assess, and apply information in making a simulated purchasing decision in an online store (www.amazon.com). Video of participants' screen activity and think-aloud protocols served as the primary data. Analysis began with open coding of two video files affording synchronous views of both the content readers viewed and think-aloud protocols generated by study participants. Higher-order codes allowed us to build on simpler descriptive findings in generating interpretive and explanatory constructs. Building on these constructs, we have defined a process-state model of this widely practiced and economically important reading-to-do task that captures many of the findings we have presented and suggests a number of potentially productive questions to guide future inquiry.

Online Commerce as a Digital Literacy: A Grounded Theory Approach

There is considerable interest in the many ways that digital technologies are extending and altering literacy practices. The bulk of the research on digital literacies by literacy researchers and educators, however, focuses on academic settings typical of schools and universities. Learning management systems and massive open online courses (MOOCs) have, for example, been widely studied. But digital technologies have also had significant impact (some might argue more impact) in settings that involve social interaction, news, cultural events, and commerce (e.g., Alvermann, Marshall, McLean, Huddleston, Joaquin, & Bishop, 2012; Sturtevant & Kim, 2010). The purpose of this study is to define a framework for understanding a digital literacy that requires sophisticated reading skills in an information-rich literacy environment but that focuses on a non-academic type of task. Specifically, our work explores how readers gather, assess, and apply information in making a simulated purchasing decision in an online store.

There are, of course, long traditions of research that focus both on reader comprehension of expository text material and on the ways users respond to online materials. Theoretical frameworks adopted by literacy educators who study expository text, however, routinely assume reading materials have a fixed text structure, an assumption that is readily refuted when readers literally create a text by selecting links (McEneaney, 2006; 2011). Studies with a computer science orientation, on the other hand, while they more commonly acknowledge the interactive nature of online text, tend to focus on computer generated log files and other technical data sources that are several steps removed from the reader experience. Our goal in the present study is to adopt a more process-oriented exploration that focuses on how readers experience and respond

to the reading task, while more adequately accounting for the genuinely novel problems and circumstances of an online reading environment.

Moreover, in addition to these more concrete differences that differentiate those who study literacy and those who study technology, researchers across these fields often adopt dramatically different theoretical frameworks, making it difficult to establish a single frame that does justice to both of these perspectives. Our goal in this study is to apply grounded theory (Strauss & Corbin, 1998; Holton & Walsh, 2016), a data-driven methodology, in an effort to define a theoretical perspective that honors both our focus on reading as a literacy process and the unique and quite distinctive experiences readers have in an online literacy setting. Our goal is to apply a grounded theory approach in responding to a single broad research question rather than address specific hypotheses. Our research question is: What kinds of strategies do readers use when in a complex information-rich online environment when making a purchasing decision?

Why Grounded Theory?

There are a wide range of qualitative methodologies that serve many different purposes. Case studies, for example, are well suited to detailed examination of individual cases, usually with the goal of revealing what is unique to understanding the chosen case (Creswell, 1998). Grounded theory (GT) on the other hand, typically begins with a broader view that often includes multiple study participants and has the goal of generating a *theory* to account for what is actually observed (Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1998). In keeping with the goal of generating new theory, GT advocates that prior theoretical commitments be deemphasized so that the data can be examined with a more open perspective rather than forcing it into an existing theoretical frame. In the present study, this is important because we are trying

to bring together quite different perspectives. Adopting a GT approach means we take a fresh perspective on the research question and let our data lead us to concepts and relationships rather than impose those in an a priori manner.

GT is, however, a methodological approach that is highly systematic in the sense that it explicitly seeks to move from complex and often messy data at the start of inquiry toward a more organized and systematic way of thinking about that data, with the ultimate goal of establishing a theory that might lead to new qualitative or quantitative research hypotheses (Holton & Walsh, 2016). GT, therefore, also serves as a kind of methodological bridge connecting the primarily qualitative educational research literature on digital literacies (e.g. Cho & Afflerbach, 2015; Zhang & Duke, 2008) to the more quantitative tradition on user navigation of online text and consumer decision-making (McEneaney, 2001; Häubl & Trifts, 2000). In short, GT provides a starting point for examining a rich and complex data set (in this case, video data) with the goal of defining a potentially generalizable theoretical frame that is intended to support further study, whether qualitative or quantitative.

Other Perspectives

Although we have chosen to adopt a grounded theory approach (Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1998), we acknowledge other perspectives that have been important in helping us situate this work and interpret our results. Transactional theory (Rosenblatt, 2004), for example, provides a general frame for thinking about literacy and meaning making that has been useful, particularly in helping us refine concepts of reader stance and the temporal nature of the reading event. Work by Mosenthal (1996), Mikelecky & Drew (1991), and Sticht (1977) on the cyclical nature of expository reading tasks also has also helped us make important conceptual connections useful in understanding our findings. Work by

Suchman (2007) provides an anthropologically oriented view of technology that highlights the mutual influences artifacts and users exert on one another, and work by researchers in marketing and consumer behavior (Hausman & Siekpe, 2009; Rosen & Rurinton, 2004) have helped us better understand the design principles behind complex interactive software.

The focus of our work as a grounded theory study, however, begins with immersion in our data as we seek to understand how readers use a complex online resource and explore what their patterns of use reveal about the ways they understand and make meaning in this environment. Methodologically, our work draws on analytical techniques developed for verbal protocols (Ericsson & Simon, 1993; Pressley & Afflerbach, 1995; Kucan & Beck, 1997), interaction analysis (Jordan & Henderson, 1995), and video data analysis (Abasi & Taylor, 2007; Helwig, 2011). Our goal, however, is primarily qualitative and generative — to define a preliminary theoretical framework to support future study rather than test specific empirical hypotheses or predictions.

Methodology

A total of 25 college-age study participants (22 female) were recruited from students in a school of education at a medium-sized Midwestern university in the US. The research protocol was reviewed and approved by a university review board. Data collection took place in a private office and began with a researcher briefly explaining the informed consent form, the nature of the research task, and participant requirements and protections. All participants had normal or normal-corrected vision, normal hearing, and were compensated with a gift-card to a local coffee shop. Some participants who were students earned extra course credit for contributing data.

The reading task presented to participants required that they search an online commerce site (www.amazon.com) for a digital camera that met researcher-specified criteria. Individual

data collection sessions began with a brief explanation of the simulated purchasing task. A scenario was described in which a friend asked for help selecting a digital camera as a gift for a relative. Participants were also presented a short printed description of the criteria to use as they completed the task (e.g., a “stylish” but “pocketable” camera that would cost less than \$200 and appeal to an 18 year-old female). Study participants also watched a short video demonstrating a concurrent think-aloud (Ericsson & Simon, 1993) prior to reading. Each participant was provided a new anonymous customer account for their session so that participants’ prior histories would not influence the behavior of the site. Participant instructions for the think-aloud procedure adhered to those advocated by Ericsson and Simon (1993). Camtasia software (Techsmith, 2007) used in data collection recorded all screen activity and the think-aloud protocols generated by study participants with a screen-mounted webcam. Video of participants’ screen activity and think-aloud protocols served as the primary data for analysis. Data preparation began with separation and synchronization of the two video streams (i.e., screen capture and think-aloud) and extraction of audio wav files to support preliminary coding of speech and silence. The primary analytic tool for viewing and coding video data was the Eudico Linguistic Annotator or ELAN (See Figure 1, Helwig, 2011). TraMineR (Gabadinho, Ritschard, Müller, & Studer, 2011) served as the primary tool for analyzing and visualizing sequential data.

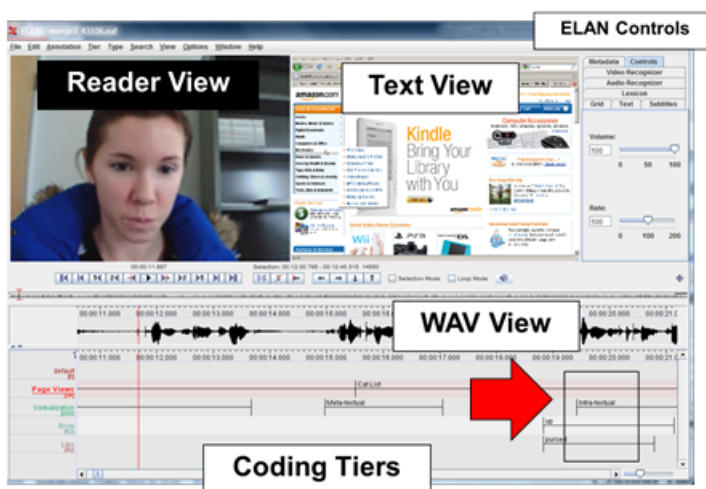


Figure 1. Screenshot of ELAN displaying the reader, page view, and wav media streams, ELAN controls, and coding tiers at the bottom with overlapping codes indicated by an arrow.

Data Analysis: Video Coding and Reliability

Video was coded in five phases. The first “Observing” phase focused on viewing all 25 participant videos (with simultaneous screen and reader views as illustrated in Figure 1) *without* attempting to code what was observed. The purpose of the observing phase was to develop general familiarity with participants’ responses to the task prior to coding. The second “Describing” phase focused on detailed exploration of three exemplar participants whose videos exhibited salient general patterns (e.g., page visit patterns) or other potentially “codeable” qualities (e.g., pronounced facial expressions) with the goal of generating first draft codes. In the third “Generalizing” phase of analysis, a larger sample of six video files were chosen for tentative coding using the codes generated with exemplars in the descriptive phase. Coding in the generalization phase, however, was still exploratory and cyclical. As familiarity with the data developed, the coding model was refined, sometimes requiring recoding of previously coded video. When the third phase of coding was complete, a fourth “Refining” phase began with a thorough review of coding techniques and the goal of articulating stable, well-defined coding procedures and conventions. This phase concluded with calculations of inter-rater reliabilities for all video-based coding categories based on a subset of six cases. In the fifth and final “Theorizing” phase of analysis, higher-level codes that crossed categorical boundaries were identified with the goal of defining theoretical constructs and explanations. All findings and interpretations presented are based on codes that emerged from the fourth and fifth phases of analysis (Refining and Theorizing).

By the end of the third phase of analysis (Generalizing), three distinct types of code had emerged (See Table 1.) Nine different page view codes were based on the page content and

participant action displayed in the screen capture video. Verbalization codes indicated what participants talked about during the think-aloud as they completed the task. Finally, two distinct facial expression codes focused on participant affect as indicated by position of participant brows and lips. Page view codes relied primarily on the screen stream video depicted in the “Text View” section in Figure 1, while facial codes relied primarily on the think-aloud video stream depicted in the “Reader View” section in Figure 1. Verbalization coding relied primarily on the think aloud stream, but we sometimes found the screen stream helpful in coding verbalizations as on-screen events sometimes served as useful indicators of attention and verbal intent. In the fourth “refining” phase of coding we focused on developing a shared understanding of the coding process and assessing reliability of the codes we were generating.

Table 1
Codes that emerged from the third phase of coding (Generalizing).

Coding Tier	Coding Vocabulary & Description
Page View Codes	Search – reader enters text into a search. Menu – mouse enters or clicks a menu bar. Category List - a list of multiple items sorted by one or more criteria. Leader – top of an item page (image of a camera at the upper left). Details – text-based information in the middle of an item page. Reviews – individual or summary reviews of cameras or vendors. Vendors – a list of merchants that sell an item. Shipping – shipping information from a specific vendor. Cart – the reader is viewing item(s) in the Amazon cart.
Verbalization Codes	Silence – no verbalization. Filler – Non-semantic verbal mannerisms (um, hm, sniffs, etc.) Intra-textual – comments on content (including oral reading). Inter-textual – comments about another page not currently viewed Meta-textual – comments about the participant’s search strategy. Prompt – comments about the prompt defining the task. Experiential – comments about personal knowledge or prior experience. Critical – comments that are explicitly evaluative and task related.
Facial Codes: Brow	Up, Down, Neutral
Facial Codes: Lips	Pursed, Neutral

Assessing reliability considered both temporal and nominal coding accuracy. Temporal accuracy refers to agreement between coders on *when* events begin and end. Nominal accuracy refers to agreement between raters in the assignment of codes to specific segments in the video stream. Because video presents a continuous observational stream, we adopted a time-interval analysis based on segmented intervals (Olswang et al., 2006; Jansen et al., 2003). Pairs of raters provided independent codes for the same individual on the four coding tiers (page views, verbalizations, brow, and lip). Codes generated by paired raters were displayed beside one another and the video stream was segmented into five second intervals. Raters were judged to have agreed if, within a five second interval, there was *both* temporal and nominal code agreement across at least 50% of the interval. This approach requires raters to agree both about what code is assigned (nominal accuracy) and when that code begins and ends (temporal accuracy). When there was at least 50% agreement across the five-second interval, that segment was coded as a “hit.” If there was less than 50% agreement, either because there was a difference in the code identified or there was a difference of more than 2.5 seconds in when events were coded as beginning or ending that segment was coded as a “miss.” Inter-rater reliability of codes ranged from good to excellent. The percentage agreement of coders across the four coding tiers were: verbalizations = 79%, page views = 92%, lip position = 94%, and brow position = 95%. We concluded that our coding had good reliability, with both temporal and nominal accuracy.

Data Analysis: Simple and Higher-order Analyses of Video Codes

Following assessment of reliability, video codes were subjected to both simple and higher-order analyses. Simple analyses looked for general descriptive patterns within each categorical coding tier analyzed separately (e.g., what are the relative proportions of the different types of verbalizations coded?). Although our goal is to define a broader theoretical framework

that crosses categorical boundaries, we believe the relatively simple analyses based on single coding categories is useful both in describing our preliminary findings and in setting the stage for the more complex higher-order analyses that follow. In addition to the simple analyses, we also carried out five different higher-order analyses. Cross-categorical analyses sought to define patterns that crossed categorical coding tiers (e.g., are codes in one tier associated with codes in another tier?) Sequential analyses sought to define sequential patterns within a single coding tier (e.g., Are there recurrent code sequences within a single coding tier?) Two of the higher-order analyses focused on relationships across coding tiers (i.e., overlap analysis and transition analysis) and three of the higher-order analyses focused on sequential patterns (transversal analysis, modal state analysis, and cluster analysis.)

Overlap analysis refers to the generation of new codes that define higher-level coding units where two existing codes co-occur, a coding process that can be automated in ELAN. In one case, for example, we crossed codes for verbalization and facial expressions to define a higher level verbalization-affect code, suggesting that certain types of verbalization were more likely to be associated with expressions of affect. Transition analysis refers to an examination of the ways codes change in one tier depending on code boundaries defined in another tier. One transition analysis we describe below looked at whether there were changes in the type of verbalizations that occurred immediately preceding a specific kind of page transition, suggesting that metacognitive commentary was more likely to precede reader clicks.

We also carried out three sequential analyses, all focusing on page view data. The goal of sequential analyses was to explore more general patterns of page and tool use by participants in the study. In order to carry out these analyses, we needed to define a common timeline to accommodate variability in total reading time by individuals. The scale we adopted was based on

dividing the continuous page view data from the video stream of each participant into 100 “percentage” intervals. Codes were then assigned to intervals based on the code that occupied the largest part of each interval. Standard rounding conventions were employed in assigning codes to intervals, assigning a code if it occupied 50% or more of an interval. One exception to our coding practice was if rounding would result in eliminating data. For example, in cases of longer reading times, a brief interval of searching might occupy less than one half of an interval. Since each interval was limited to a single page view code, standard rounding procedures would have eliminated data by rounding short page views down to 0 and excluding this data from the final coding sequence. In order to retain the full data sequence, we coded all page view durations of 1% or less as a single interval. As a result of this rounding procedure, the number of intervals across participants sometimes exceeded 100, with missing data markers used to fill out shorter sequences. In all cases, however, sequential analyses ignored missing data.

A transversal analysis was applied to explore the reading task as an individually adjusted *process*, defined in terms of participants’ progress from the beginning to the end of their individual reading episode (Gabadinho et al., 2011). Our goal in this analysis was to explore whether certain types of page views tended to dominate portions of the reading process. Following up on the transition analysis, we carried out a modal analysis to highlight the most common page views displayed at each interval in the process. Finally, a cluster analysis sorted reader types based on similarity of sequential page view patterns across the reading process, resulting in a preliminary reader typology.

Presentation of the research results will consider each analysis separately. Following presentation of the research results, we explain how these separate findings fit together within a larger theoretical whole.

Research results: Simple Analyses and Findings

Figure 2 presents overall percentages of time allocated by readers to different types of page views and verbalizations during the reading task, with Table 1 providing more specific information about how each code should be interpreted. Our analysis of page view codes led us to two main conclusions regarding page views.

1. Three page view codes dominate this reading task, with about 70% of total reading time consistently devoted to CatList, Leader, and Detail page views for most readers.
2. Readers seem to have a clear preference for browsing (rather than searching), with Search and Menu page views accounting for only about 6% of total reading time, although search fields and pop-up menus were available on nearly every page.

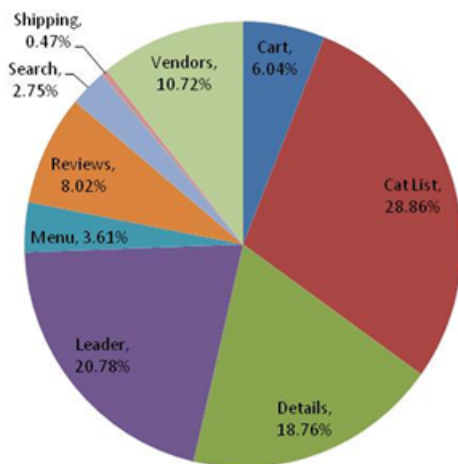


Figure 2A. Page views across the task.

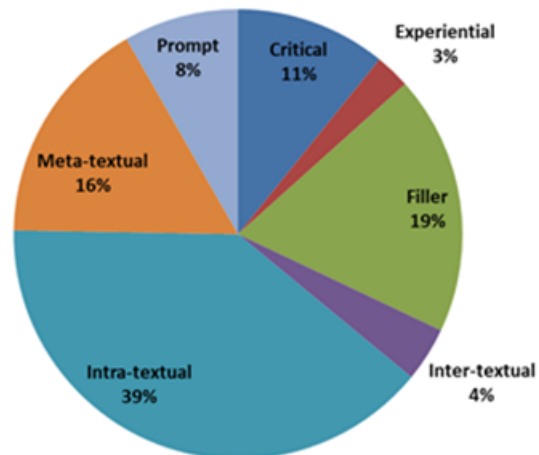


Figure 2B. Verbalizations across the task (excluding silence).

Our analysis of the think-aloud protocols led us to four main conclusions regarding verbalizations.

1. Verbalizations are dominated by intra-textual commentary and most commonly reflect text vocalization during reading (an artifact of the think-aloud methodology).
2. Readers demonstrated relatively high levels of meta-textual commentary (16% of all verbalizations), suggesting engaged and reflective reading.
3. Past experience appears to be a good predictor of the task outcome — of seven participants who stated they owned a certain brand of camera, four selected that brand.
4. Finally, we noted that more effective think-aloud participants (i.e., who produced less silence) tended to generate relatively more critical and experiential verbalizations.

Unlike the verbalization and page view data, facial expression codes for brow and lip movement were infrequent, accounting for only about 5% of the video stream. We did not, therefore, attempt simple analyses of facial expressions. We were, however, curious about whether facial expression codes might be more informative when considered in conjunction with other codes and began our higher-order analyses with an overlap analysis exploring relationships between facial expressions (collapsed into a single facial expression code) and verbalizations. An example of this kind of cross-categorical overlap of codes is identified by the arrow highlighting the region in Figure 1 where simultaneous codes appear for page view, verbalization, and both lip and brow movement. We discuss higher-order findings in the next section.

Higher-order Analyses and Findings

Our first higher-order analysis was an overlap analysis that examined the relationship between indicators of affect (facial expressions) and verbalizations. We began by establishing a baseline for the relative frequency of verbalization types for all participants across the entire reading task. We then recomputed relative frequencies for verbalizations that co-occurred with measures of affect. The results of the overlap analysis are displayed in Figure 3 displaying the

relative proportions of verbalizations in general on the left and relative proportions of verbalizations during displays of facial affect on the right. Comparison reveals that filler and intra-textual commentary increase during facial affect, with decreases in other verbalization categories, suggesting that readers may limit their more substantive task-related commentary during episodes of more intense internal activity, as suggested by displays of affect such as furrowed brows and pursed lips.

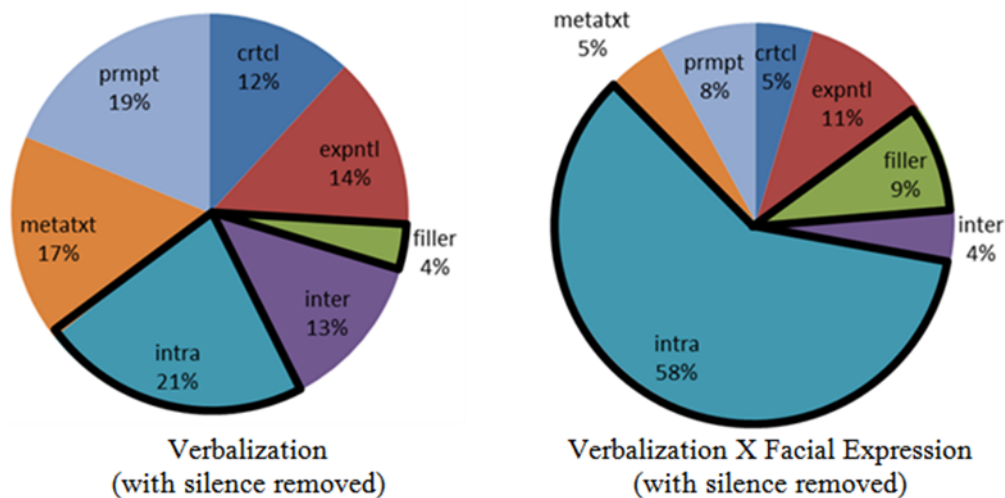


Fig. 3. Relative proportions of verbalization codes overall (left) and when overlapping with facial expression (right.)

Our next three higher-order analyses explored transition relationships between page views and other codes. We were particularly interested in looking at page transitions from the more global CatList page view with numerous images of different cameras to



4A. A CatList page view.

4B. A Leader page view.

Fig. 4. An illustration of a transition from the more global CatList view (4A) to the more specific Leader view (4B).

the more specific local view of an individual camera provided by a Leader page view (See Figure 4) since this transition most clearly captured the intent of the reading task to select an

Table 2

Results of cross-categorical analyses examining associations between CatList-to-Leader page transitions and other coding categories.

Verbalization	$\chi^2(6, n=164) = 33.61, p < .0001$
Brow Movement	$\chi^2(2, n=164) = 12.73, p < .005$
Lip movement	$\chi^2(1, n=164) = .7097, p > .05$

individual camera from among the many that were available. We addressed three specific questions about the association between page view page transitions and other codes:

1. Do certain verbal codes tend to precede CatList-to-Leader page transitions?
2. Do brow movements tend to precede CatList-to-Leader transitions?, and
3. Do lip movements tend to precede CatList-to-Leader transitions?

In each case, we carried out a chi-square goodness-of-fit analysis comparing the observed frequencies of codes in the five-second period before the click to overall frequencies across the reading task as a whole that served as our expected values. Results (see Table 2) indicated that meta-textual commentary tended to increase and verbal filler tended to decrease in the period immediately preceding the click. In addition, brow movement (down) also increased, but there did not appear to be any difference in lip movement.

Our last series of higher-order analyses focused on what sequential patterns within page view data might reveal about the reading process. As noted earlier, in order to analyze the reading task as a temporal process it was necessary to establish a standard percentage time scale to account for variability in participants' total reading times (mean = 12.24 minutes, sd. = 6.23 minutes). Results of the percentage-scaled data visualization are illustrated in Figure 5A with each page view code represented by a different color and identifier with individual reader contributions weighted by total reading time. The relative height of each bar corresponds to the

weighted sum of individual values at each percentage interval. As noted earlier, values on the horizontal time scale exceed 100 as a result of the rounding procedure we adopted to avoid data loss. Results at the far right of each chart are therefore based solely on those participants for whom data was available and as a result become increasingly sensitive to individual readers, and therefore less reliable, at the far right-hand side of the scale.

One pattern evident in Figure 5A, for example, elaborates on the general pattern of page views illustrated in Figure 2A, highlighting page view variation across the reading task as a whole. Figure 2A, for example, indicates three page views dominate the reading process but does not reveal how these page views are used across the reading process, something that Figure 5A illustrates in considerable detail. CatList page views, for example, clearly dominate the earliest stages of the task as readers orient themselves to what is available. Beyond the first 10% of the task, however, CatList page views subside, stabilizing at a lower level and Leader, Detail, and Review pages assume a larger proportion of combined page views totaling between 60% and 80% until the task approaches 90% completion, at which point Cart and Vendor page views assume larger proportions as readers make their choices.

Moreover, the page view patterns we see in 5A become still clearer in the modal page view chart illustrated in figure 5B, where only the most common page view code is displayed for each interval in the reading process. As in 5A, the dominance of the CatList view in the earliest stages of the task is evident. Once readers complete the first 10% of the task, however, they adopt two distinct cyclical reading patterns. A local reading cycle involves participants moving back and forth between the more general information about a specific camera provided by the Leader view and the more specific information provided by the Detail and Review page views. The second more global cycle involves participants moving back and forth from the higher-

ground perspective afforded by the CatList views and views that focus on specific individual cameras (i.e., Leaders, Details, and Reviews.) Moreover, the page view evidence in support of this global cycle is reinforced by the prior transition analyses showing that verbalization and

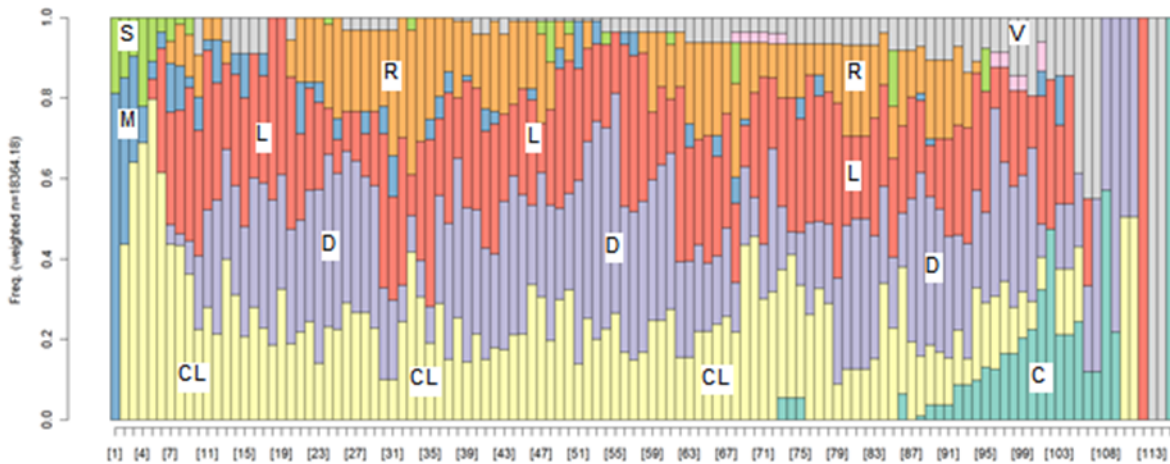


Fig. 5A. Proportions of page view codes for all participants by percentage of the reading task completed. Proportions are weighted by the overall time to complete the task by each reader.

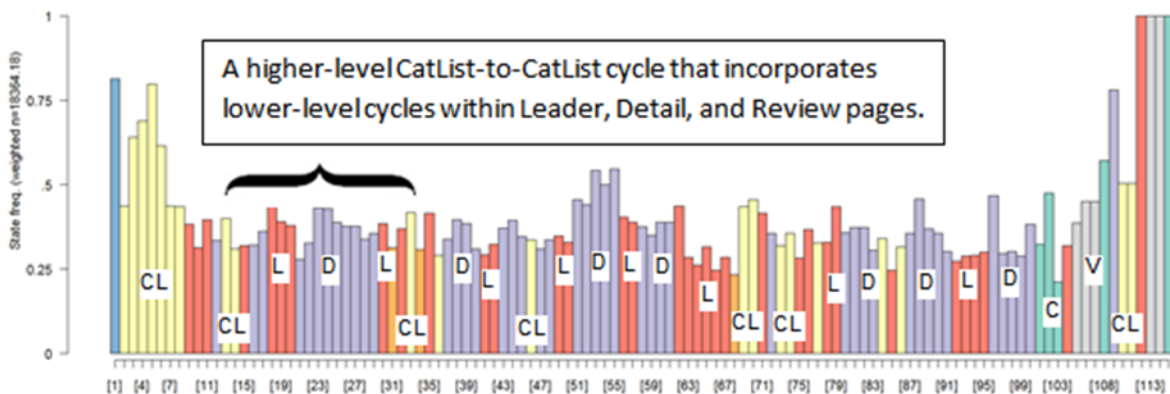


Fig 5B. Most frequent page view across all participants during the reading with position in the process based on percentage of the task completed. The curly bracket illustrates a global CatList cycle with several local cycles within, drawing on Leader, Details, and Reviews.

Fig. 5. Normalized traversal analyses for all page view codes (5A) and for most frequent (i.e., modal) page view codes (5B) across the reading task. Percentages exceed 100% due to rounding up of percentage values less than 1 to avoid eliminating data. Legend appears at the right.



CatList=CL Details=D Leader=L Menu=M
 Reviews=R Search=S Vendors=V Cart=C

affect change across this global-local boundary. Finally, the significance of this boundary across the reading process as a whole is reinforced by the presence of CatList page views up until the reading process is almost complete, at which point the Cart page views gradually replace it. In effect, evidence from our sequence data identifies two distinct reading cycles, one that is more local, focusing on gathering information about specific items (i.e., the local cycling within Leaders, Details, and Reviews) and a higher-level global cycle that tests whether the information that has been gathered is sufficient to make a decision and, if not, reorients the reader's focus as the reading process continues.

In our final series of cluster analyses we sought to define a reader typology based on sequential page view data. The heart of this exploratory technique is to sort participants based on the similarity of the page view patterns during reading. Briefly, participants are sorted into groups based on an optimal matching distance measure (Levenshtein, 1966) that accounts for both a more basic similarity measure relying on shared subsequences (Elzinga, Rahman, & Wang, 2008) and a more flexible measure based on the number of steps required to transform one pattern into another when insertions, substitutions, and deletions are allowed (Abbott, 2001; Abbot & Forrest, 1986). Results of the cluster analyses suggest three distinct reader types based on the page view patterns illustrated in Figure 6.

Cluster 1 identifies seven "social" readers who used CatList page views to initially orient themselves but subsequently relied heavily on reviews posted by other consumers on the online commerce web site in making their decision. Social readers also tend to read longer than other reader types (mean = 14.75 minutes, sd = 3.59), and although they make use of Leaders and Details, these views are secondary to the larger frame provided by the CatList views depicted at the bottom and the Review page views at the top. Cluster 2 identifies a small group of four

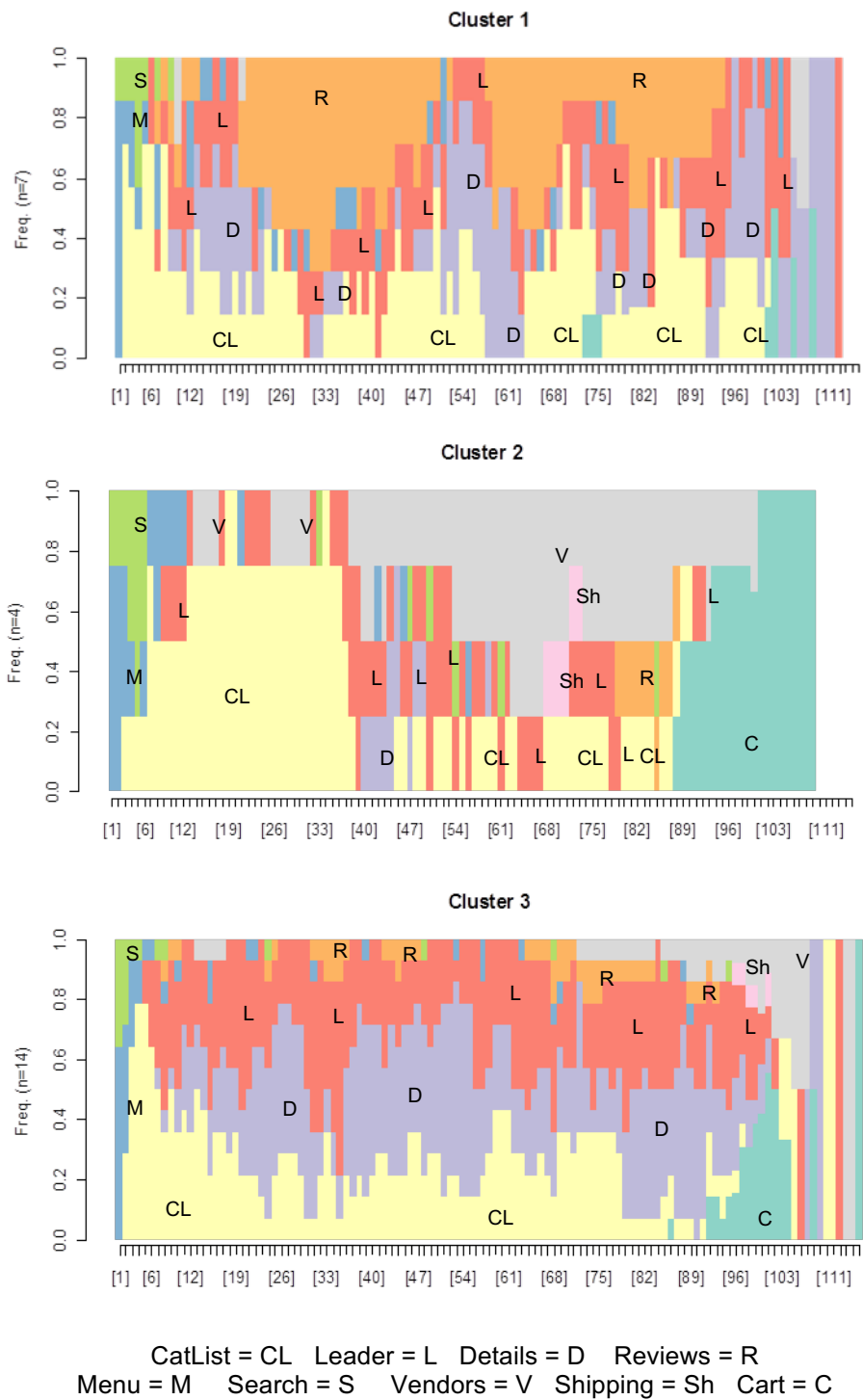


Fig. 6. Reader types based on optimal matching distances. Width of each chart varies depending on overall reading time of group members as a result of rounding. Color

conversions to grayscale vary across clusters to highlight differences between adjacent color regions.

“surface” readers whose reading process tends to be brief and relies on a heavy early emphasis on CatList pages followed almost immediately by heavy reliance on Vendor page views that emphasize task-closure activities primarily focused on price and shipping. Surface readers spend the shortest period of time reading (mean = 7.12 minutes, sd = 3.03) and make relatively little use of Leader and Detail pages across the reading task. Decision making by surface readers appears to rely on a fairly cursory reading of available information but an unusual emphasis

(compared to the other two reader groups) on vendor information. Cluster 3 is the largest group, with 14 readers, who adopt a more “strategic” approach to the reading task, seeking out a fuller view of available options in a systematic way. Strategic readers (mean = 12.453 minutes, sd = 7.22) are most clearly distinguished from the other two groups by a more data oriented and systematic approach to decision making that relies on both a wider range and a more even dispersal of page types across the reading task as a whole. Strategic readers seek out CatList pages for higher-level views, Leaders and Details for specific information about individual items, and Reviews that provide a social perspective. In short, strategic readers use a wider variety of page views in a more complex fashion that does not adhere to the simpler blocking patterns evident in the cluster patterns of the other two groups.

A Preliminary Theory

In this penultimate section we step back from our data and findings in an effort to define more general principles and explanatory mechanisms to account for what we have observed. Our goal is to present a theoretical framework that both explains our findings and leads us to new questions that will serve to guide further inquiry. In reviewing our findings we converged on two theoretical constructs that support much of what we have seen: cyclical processing and reader states defined in terms of perspective and strategy. Cyclical processing seems to be the construct operating at the highest level, so we begin our theorizing by presenting a general process model based on page view data that seeks to capture the flow of reader attention across the reading task as a whole (see Figure 7.)

Cyclical Processing in the Preliminary Theory.

In the model we advocate, Leader, Detail, and Review page views focusing on specific cameras (labeled “Item Review” in Figure 7) are at the heart of this reading task. These three page views represent the local cycle that drives the reading process as readers gather and weigh information about their choice. In addition to this local cycle, there is another higher-level cycle that allows readers to step back from views

of individual items so they can consider a broader perspective. The CatList page view typically anchors this broader cycle, with most readers relying on a CatList view to reorient themselves between local cycles (although there are occasions when Search and Menu page views serve this role.) We also note that there is a clearly

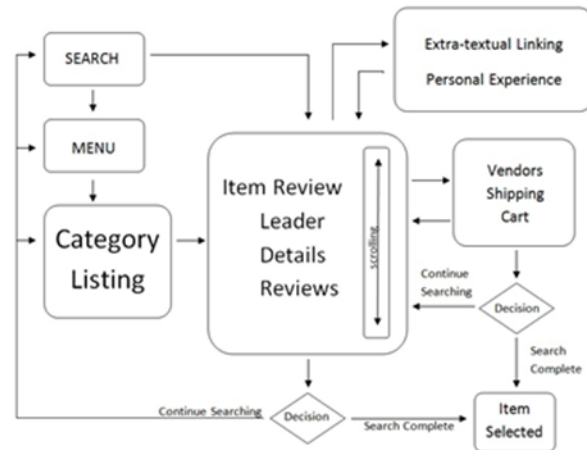


Fig. 7. A flowchart modeling processing in the reading task including scrolling within local item review and transitions across global and local perspectives using menus, links, and search fields.

developmental process that seems to operate across this task, with relatively larger proportions of Menu, Search, and CatList views early in the process and relatively larger proportions for Vendor, Shipping, and Cart views late in the process. Overall, readers spent 36% of their time in more global views and 48% of their time in local views associated with individual items, with these percentages rising even higher when the orientation and conclusion phases at the beginning and end of the reading task are excluded. In short, our data point to a cyclical process model like that depicted in Figure 7 in which readers cycle between more global and more local views until there is a decision that the task criteria have been met.

Both our transitional and our process analyses support this hierarchical cycling framework. The curly bracket identifying a subsequence of the normalized modal page view data

presented in Figure 5B, for example, clearly depicts local cycling between Leader and Detail views framed within a higher-level cycle defined by CatList codes representing transitions to a higher-level perspective between local cycles. Overall, readers tend to adopt a three-stage developmental sequence across the task as a whole, with an opening stage defined by high-ground views on the left (i.e., CatList, Search, and Menu), a hierarchical cycling stage in the middle alternating between local and global cycles as they work through the bulk of the reading task, and then transitioning to page views associated with task-closure (i.e., Vendors, Shipping, and Cart) as they converge on their decision. We also noted informally from the think-aloud protocol that participants tended to verbalize an intention to “go back” when they left a local view (i.e., an item review page view) to move to a higher-level CatList page view. Finally, as we noted in the discussion of transition analyses, the frequency of meta-textual commentary and filler verbalizations change when readers cross a global-local boundary, suggesting that these transitions reflect cognitively significant events in the reading process.

We would argue as well that cyclical process models have been widely adopted by many other reading theorists and researchers. Cyclical processing is, for example, the hallmark of interactive theories of reading whether they adopt a neurocognitive (Rumelhart, 2004, Seidenberg, 2007) or a traditional psycholinguistic orientation (Goodman & Goodman, 2004; Smith, 2004). More immediately relevant in the present context, Mosenthal’s (1996) reading-to-do document processing model incorporates a clearly hierarchical cyclical structure that accommodates both local and more global decision making in solving a reading task. Finally, in other closely related work, studies of reading in hypertext have shown reader sensitivity to, and use of hierarchical cycling as evidenced by link selection (Lawless, Brown, Mills, & Mayall, 2003; Lawless, Schrader, & Mayall, 2007; McEneaney, 2001; McEneaney, Li, Allen, &

Guzniczak, 2009), suggesting that, while there are novel aspects in the hierarchical cycling observed in our work, this theme is well rooted in the literature on reading.

Finally, the cyclical model we advocate also finds support in the reader typology that emerged from our cluster analysis, with all three distinct reader types providing consistent evidence for transitions across global-local boundaries across much of the reading task even when there was only limited evidence of cycling within global or local page views. Strategic and social readers, for example largely ignored global page views (Menu, Search, Vendors, Shipping) except for the CatList views that anchored their hierarchical cycling. Surface readers, on the other hand, largely ignored Detail and Review pages, but regularly returned to the Leader page views that anchored their hierarchical cycling. Moreover, as we became more sensitive to the role of cycles in the page view data, we noticed as well that reader states seem to cycle in ways that parallel the page view data, with four distinct states defined by two relatively independent constructs that reflect reader attention.

Reader States in the Preliminary Theory.

The concept of reader state, like cyclical processing, has well-established precedents in prior reading research. Explicitly cognitive models often define reader states in precise operational ways, but even philosophical theories of reading (e.g., Rosenblatt, 2004; Iser, 1978) acknowledge that both reader and text express state values that change over time, and in online reading materials this notion of both reader and text as capable of transitions to new states has become quite literal (McEneaney 2006; 2011).

In the present context, two reader state constructs are most relevant for modeling how readers respond in this reading task: perspective and strategy (see Table 3.) Perspective refers to the level of the view that the reader adopts at any given point in the reading process, while

strategy refers to whether the reader’s attention is focused on gathering information (i.e., a focus on content) or managing the reading process as a whole (i.e., a focus on the task). Furthermore, these two reader state constructs are distinct enough to define four relatively discrete reader states that map in a straightforward fashion onto the developmental sequence revealed by Figure 5A.

Specifically, the earliest stage of reading falls clearly in the lower left-hand corner of Table 3 (i.e., the Task-Global quadrant) as evidenced by the dominance of Menu and Search page views. Readers quickly moved, however, from using Search and Menu tools to a more content-driven browsing approach. As a result of this, the dominant reader state shifts into the Content-Global quadrant in the upper left for the remaining portion of the first tenth of the reading process, with CatList page views dominating this period.

In the span ranging from about 10% to about 90% completion of the reading process, readers tend to either move back and forth between global and local views within the content

Table 3
Reader states defined by the concepts of perspective and strategy in the reading task with examples of verbalizations associated with these states

	Global Perspective	Local Perspective
Content Strategy	Quadrant II: Content-Global Gathering information about general options (camera makes, prices, etc.), driven either by past experience or search and menu tools. The goal is to narrow options by browsing. (“Let’s see what SONY has.”)	Quadrant I: Content-Local A focus on careful review of qualities of available options. The goal is to size up a specific camera in a general way, usually independent of the task prompt. (“This one has a good review.”)
Task Strategy	Quadrant III: Task-Global Systematic search for specific qualities, often based on the task requirements. The goal is to sort and eliminate general options to narrow the pool of specific cameras that must be considered. (“I’ll put in less than \$200.”)	Quadrant IV: Task-Local A focus on evaluating qualities of specific cameras that are usually tied to the task requirements. The goal is to sort and/or eliminate specific cameras on the basis of the qualities specified in the prompt. (“Good, this one’s under \$200!”)

strategy row (because of their preference for browsing) or move up and down in the local perspective column (because they are either gathering or evaluating information about specific cameras.) Finally, in the last tenth of the reading process Vendor and Cart page views begin to dominate, signaling that the process as a whole is converging on a solution and gradually pinching off the Leader, Detail, and CatList views that are the primary drivers of the reading process. In short, the reading process appears to begin and end in the Task-Global quadrant with the bulk of reading between the 10 and 90 percent intervals relying on two distinct types of cycles: a local process cycling between content and task strategies within a local perspective (i.e., cycling between quadrants I and IV) and a content-oriented process cycling between more global and more local perspectives (i.e., cycling between quadrants I and II). Figure 8 presents an illustration of this integrated process-state model indicating dominant states associated with each process stage.

Implications and Applications

The results and interpretations we have presented suggest that, although online literacies like the one we have studied present genuinely novel challenges for readers, there are clear connections linking our results with findings reported for reading both traditional expository text and online materials. Perhaps the most significant overlap we observe in connection with prior work is the observation that readers cycle between cognitive and meta-cognitive states as they gather information from a text and make decisions about what strategies are working. Even though readers only rarely made explicit statements about this cycling, three distinct findings suggest this represents an important operating principle. One finding is the association between metacognitive commentary and subsequent clicks that led readers to new content. A second finding is the pattern of page views over time, documenting a cycling of attention between more

global and more local perspectives. Finally, a third finding is that the so-called “strategic readers,” whose reading evinced the most consistent use of multiple strategies over the full course of the reading event made up nearly 60% of all readers, suggesting that this cycling pattern is typical of a large proportion of the participants in the study.

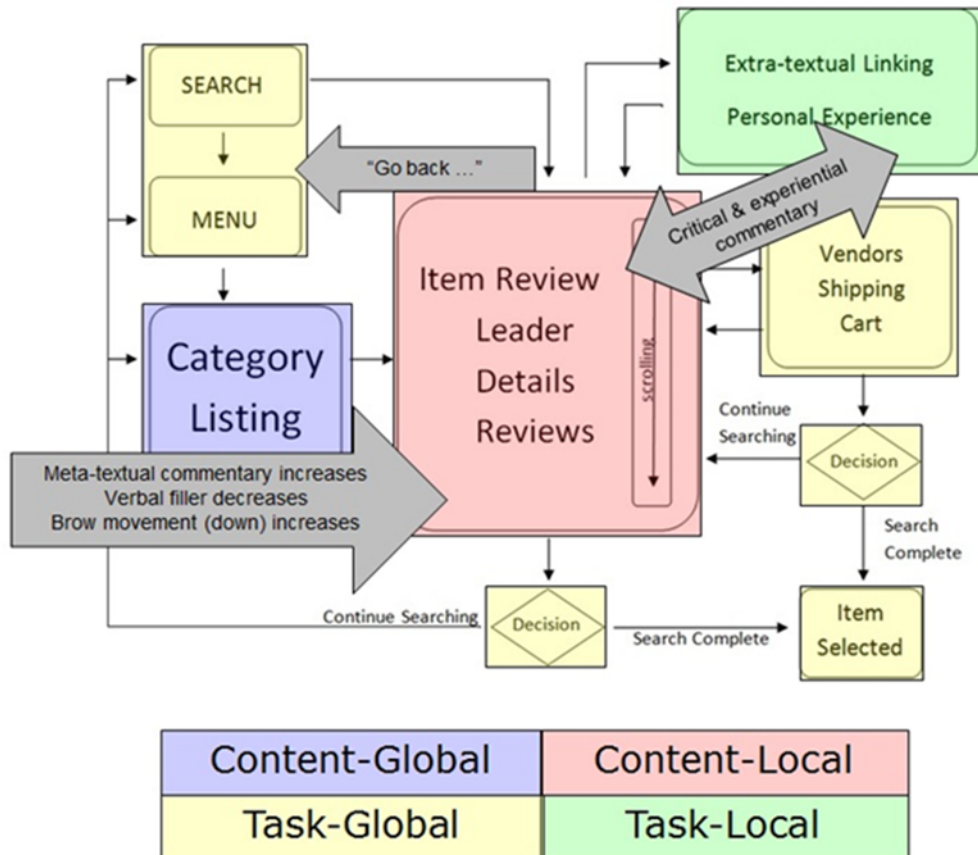


Fig. 8. An integrated process-state model for the reading task with examples of reader response markers associated with state transitions.

The fact that readers do not seem to be consciously aware of this cycling process suggests, however, that an interactive reading environment like Amazon.com could be modified to better support the reading process by tracking reader behaviors and offering support that aligns with a reader’s current state and strategy. Interactive tools might also be able to tailor support or

tools for different reader types since the needs and interests of surface, social and strategic readers are quite distinct. Furthermore, these strategies might also have a more general pedagogical potential, as a vocabulary for teaching people how to adopt a more conscious and strategic approach to using complex online resources.

Conclusions, Limitations, and Questions for Further Inquiry

We have presented a grounded theory for an online reading-to-do task. Our work began with open coding of multiple streams of video data that afforded us synchronous views of both the content that readers viewed online and think-aloud protocols generated by study participants. Our primary codes relied exclusively on native video data and were found to have good to excellent inter-rater reliability. Higher-order codes helped us move us from primarily descriptive findings to more interpretive and explanatory constructs. Building on these constructs we have defined a process-state model that captures many of the findings we have presented and suggests a number of potentially productive questions to guide future inquiry. We offer the following conclusions.

1. Cross-categorical analyses suggest that verbalization and displays of affect are associated with specific reader state transitions defined by the grounded theory we propose.
2. Analyses of the reading process adjusting for individual differences in reading time suggest a general developmental sequence across the reading task.
3. Cluster analyses of reading process patterns suggest three reader types (social, surface, and strategic readers) who use provided resources in three distinctly different ways.
4. This reading-to-do task relies on two interacting cyclical processes, a local cycle focused in individual items and a more global cycle focused on the reading process as a whole.

5. Two functionally defined conceptual constructs (reader perspective and strategy) complement and extend the cycling process model that emerges from our data.

One important limitation of this work is its focus on a fairly narrow type of reading transaction tied to online commerce. The prodigious growth of this specific literacy practice over the past decade, however, is well documented and there is a compelling case in support of the significance of this specific literacy practice as a basic literacy life-skill. Whether or not this research will inform us in broader ways remains to be seen. We would argue, however, that this specific literacy practice warrants the attention of both literacy researchers and educators as a consequence of its practical and economic significance. A second important limitation of the work we present is that we have no clear answer to what extent the findings we report and the model we advocate can be applied to other settings or other populations of readers. We would point out, however, that we have developed a conceptual framework that is sufficiently well articulated to support predictions that will help better assess the extent to which generalization is warranted. A second important limitation we note is that this work is exploratory and based on a small sample ($n=25$) drawn from a specific population (college students at a suburban Midwestern university in the US.) As a result of this limitation we would emphasize that we do not make any claims to broad generalizability of these findings. Nevertheless, we view these findings as well-supported for the population we have studied and believe these results warrant further work.

We close with a number of questions that continue to guide our inquiry. Because of the design of this study, one important question that remains unaddressed has to do with the relative “effectiveness” of the approaches adopted by different readers. Because the task was framed as a choice that did not require justification and the task requirements were general in nature, we

cannot say much about the qualities that distinguish more- and less-effective readers, although our reader typology seems to suggest at least one promising line of inquiry. As noted earlier, surface readers seem to hurry through the task. Strategic readers, on the other hand, seem to adopt an approach that is both more systematic and more thorough. We would like to know more about what different types of readers learn from this kind of reading task, but did not include a debriefing measure to assess this.

Another important set of questions follow up on the finding that certain types of verbalizations tend to precede certain types of page view transitions. We are interested in further transition analyses to explore relationships across coding categories that are defined by transitions. We are also interested in exploring two specific theoretical questions related to findings 3 and 5. One theoretical question focuses on whether the reader typology based on social, surface, and strategic readers is generalizable. Are these patterns observed in other similar reading-to-do contexts and populations of readers? We believe the theoretical frame we have developed is sufficiently detailed to support a larger-scale empirical test and we believe this test could both further clarify the model and support new avenues for research. Finally, we hope to identify other observable indicators associated with the constructs of reader perspective and strategy since these constructs are central to the hierarchical cycling model we advocate. Are there other codes that are reliably associated with either global or local cycling transitions similar to the meta-textual verbalizations noted when readers transition from a CatList to a Leader page view? Although the four reader states we have defined seem to work quite well in explaining what we have seen, we would like to define these constructs in more specific operational terms so that the empirical adequacy of the model we propose can be tested. In short, although we believe this work presents us with a relatively well-formed grounded theory, its major

contribution to our continuing work is the opportunity it provides to push our thinking in ways that will support new questions and more rigorous assessments of its adequacy

References

- Abasi, A. R. & Taylor, M. C. (2007). Tackling the issues and challenges of using video data in adult literacy research. *Australian Journal of Adult Learning*, 47(2), 289-307.
- Abbott, A. (2001). *Time matters. On theory and methods*. Chicago: Chicago Press.
- Abbott, A. & Forrest, J. (1986). Optimal matching methods for historical sequences. *Journal of Interdisciplinary History*, 16, 471-494.
- Alvermann, D. E., Marshall, J. D., McLean, C. A., Huddleston, A. P., Joaquin, J., & Bishop, J. (2012). Adolescents' we-based literacies, identity construction, and skill development. *Literacy Research and Instruction*, 51, 179-195.
- Cohen, J. (1960). A coefficient for agreement for nominal scales. *Educational and Psychological Measurement*, 20, 37-46.
- Creswell, J. W. (1998). *Qualitative inquiry and research design*. Thousand Oaks, CA: Sage.
- Elzinga, C., S. Rahmann and H. Wang (2008) Algorithms for Subsequence Combinatorics, *Theoretical Computer Science*, 409(3), 394-404.
- Ericsson, K. A. & Simon, H. A. (1993). *Protocol Analysis: Verbal Reports as Data*. Cambridge, MA: MIT Press.
- Gabadinho, A., Ritschard, G., Müller, N.S. & Studer, M. (2011), Analyzing and visualizing state sequences in R with TraMineR. *Journal of Statistical Software*, 40(4), pp. 1-37.
- Glaser, B. & Strauss, A. (1967). *Discovery of Grounded Theory*. Chicago: Aldine.
- Goodman, Y. M. & Goodman, K. S. (2004). To err is human: Learning about language processes. In R. Ruddell & Norman J. Unrau (Eds.), *Theoretical models and processes of reading*, 5th Edition. (pp. 1363-1398). Newark, DE: IRA.

- Häubl, G. & Trifts, V. (2000). Consumer decision making in online shopping environments: The effects of interactive decision aids. *Marketing Science*, 19(1), 4–21.
- Hausman, A. V. & Siekpe, J. S. (2009). The effect of web interface features on consumer online purchase intentions. *Journal of Business Research*, 62(1), 5-13.
- Helwig, B. (2011). *EUDICO Linguistic Annotator* (Version 4.1) [Computer software and manual.] Retrieved June 30, 2011 from <http://www.lat-mpi.eu/tools/elan/>.
- Holton, J. A. & Walsh, I. (2016). *Classic grounded theory: Applications with qualitative and quantitative data*. Thousand Oaks, CA: Sage.
- Iser, W. (1978). *The act of reading*. Baltimore, Maryland: Johns Hopkins University Press.
- Jansen, R. G., Wiertz, L. F., Meyer, E. S., & Noldus, L. P. J. J. (2003). Reliability analysis of observational data: Problems, solutions, and software implementation. *Behavior Research Methods, Instruments, & Computers*, 35(3), 391-399.
- Jordan, B. & Henderson, A. (1995). Interaction analysis: Foundations and practice. *The Journal of the Learning Sciences*, 4(1), 39-103. Available online: <http://www.jstor.org/pss/1466849>
- Kucan, L. & Beck, I. L. (1997). Thinking aloud and reading comprehension research: Inquiry, instruction, and social interaction. *Review of Educational Research*, 67(3), 271-299.
- Lawless, K. A., Schrader, P. G., & Mayall, H. J. (2007). Acquisition of Information Online: Knowledge, Navigation and Learning Outcomes. *Journal of Literacy Research*, 39(3), 289-306.
- Lawless, K. A., Brown, S. W., Mills, R. & Mayall, H. J. (2003). Knowledge, Interest, Recall and Navigation: A Look at Hypertext Processing. *Journal of Literacy Research*, 35(3), 911-934.
- Levenshtein, V. (1966). Binary codes capable of correcting deletions, insertions, and reversals. *Soviet Physics Doklady*, 10, 707-710.

- McEneaney, J. E. (2011). Web 3.0, Litbots, and TPWSGWTAU. *Journal of Adolescent and Adult Literacy*, 54(5), 376-378.
- McEneaney, J. E., Li, L., Allen, K., & Guzniczak, L. (2009). Stance, navigation, and reader response in expository hypertext. *Journal of Literacy Research*, 41(1), 1-45.
- McEneaney, J. E. (2006). Agent-based Literacy Theory. *Reading Research Quarterly*, 41(3), 2-21.
- McEneaney, J. E. (2001). Graphic and numerical methods to assess navigation in hypertext. *International Journal of Human-Computer Studies*, 55, 761-786. (PR)
- Mikulecky, L. & Drew, R. (1991). Basic literacy skills in the workplace. In R. Barr, M/ L/ Kamil, P. B. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. 2, pp. 669-689). New York: Longman.
- Mosenthal, P. B. (1996). Understanding the strategies of document literacy and their conditions of use. *Journal of Educational Psychology*, 88(2), 314-332.
- Olswang, L. B., Svensson, L., Coggins, T. E., Beilinson, J. S., Donaldson, A. L. (2006). Reliability issues and solutions for coding social communication performance in classroom settings. *Journal of Speech, language, and Hearing Research*, 49, 1058-1071.
- Pressley, M. & Afflerbach, P. (1995). *Verbal protocols of reading*. Hillsdale, NJ: Erlbaum.
- R Development Core Team (2011). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL: <http://www.R-project.org/>.
- Rosen, D. E. & Purinton, E. (2004). Website design: Viewing the web as a cognitive landscape. *Journal of Business Research*, 57(7), 787-794.

- Rosenblatt, L. (2004). The transactional theory of reading and writing. In R. Ruddell, M. R. Ruddell, & H. Singer (Eds.), *Theoretical models and processes of reading*, 5th Edition. (pp. 1363-1398). Newark, DE: IRA.
- Rumelhart, D. E. (2004). Toward an interactive model of reading. In R. Ruddell, M. R. Ruddell, & H. Singer (Eds.), *Theoretical models and processes of reading*, 5th Edition. (pp. 1149-1179). Newark, DE: IRA.
- Seidenberg, M. S. (2007). Connectionist models of reading. In G. Gaskell (Ed.), *Oxford Handbook of Psycholinguistics*, pp. 235-250. New York: Oxford University Press.
- Smith, F. (2004). *Understanding reading*. Mahwah, NJ: Erlbaum.
- Sticht, T. (1977). Comprehending reading at work. In M. A. Just & P. A. Carpenter (Eds.), *Cognitive processes in comprehension* (pp. 221-246). Hillsdale, NJ: Erlbaum.
- Strauss, A. (1987). Qualitative analysis for social scientists. Cambridge: University of Cambridge Press.
- Strauss, A. & Corbin, J. (1998). *Basics of Qualitative Research* (2nd Ed.) Thousand Oaks, CA: Sage.
- Sturtevant, E. G. & Kim, G. S. (2010). Literacy motivation and school/non-school literacies among students enrolled in a middle-school ESOL program. *Literacy Research and Instruction*, 49, 68-85.
- Suchman, L. A. (2007). *Human-Machine Reconfigurations*. Cambridge: Cambridge University Press.
- TechSmith (2007). *Camtasia Studio* (Version 4.0.2) [Computer software.] Okemos, MI: TechSmith.

