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Confronting the Digital Divide: Debunking Brave New World Discourses

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Abstract

There is far more to the digital divide than meets the eye. In this article, we consolidate existing research on the digital divide to offer some tangible ways for educators to bridge the gap between the haves/have nots or "the cans and cannots." Drawing on Huxley's (1932) notion of a "brave new world", there are digital divide approaches and frameworks that require debunking and that are strongly associated with first world nations which fail to take account of the differential access to technologies for people who live in poverty. Taking a closer look at current realities, we send a call out to teachers, administrators, and researchers to think more seriously and consequentially about what the wide-spread adoption of technologies has had on younger generations and the role of the digital on knowledge creation and on imagined futures.

Teaser Text

Our current focus on digital literacies in P-12 classrooms suggest a world where all students have limitless access and enjoyment of media and technology, however this is simply not the case. In this article, we survey research from the field on the digital divide to probe deeper into the worrying gap between the haves or the have nots. With all of the lip service paid to "twenty-first century literacy" in educational policy and practice, the field needs to think seriously about who has access to digital literacies and who does not.

Pause and Ponder

1. Do you know what technologies your students have access to outside of school?

2. How many of your students have high speed Wi-Fi access to do research and to complete assignments?

3. How does access to technology, media and different forms of communication impact academic literacy achievement?

4. Have you ever thought about the kinds of twenty-first century privileges that some students have over others?

Introduction

The presiding question of this article is: are young people's positions as literacy learners limited by a lack of access to technology? Digital literacies suggest a world where people have constant access to technologies, apps, videos, and social media that allow for exploration, knowledge work, and connections between people and this is simply not the case for so many people, particularly children and adolescents. In writing this article, we are less concerned about what digital literacies and twenty-first century approaches do for younger generations' thinking and learning as we are concerned about how digital literacies or a lack thereof impact different populations of learners. That is, we attend to the more immediate problem of a gap between the digital haves and have nots. Or, as Dolan (2016) argues, "the cans and cannots."

With increasing attention to digital literacies, a brave new world belief and discourse has developed that romanticizes what digital literacies are and these beliefs and discourses broadly neglect those who do not have them. Although this rhetoric may lead to productive conversations, it sometimes neglects an ugly truth that people living in poverty do not have the same technological affordances as their more affluent peers and, often, they do not have access and ownership of the technologies themselves. When children have limited to no Wi-Fi and

screen access, no technology or screen use and no way of keeping up with other kids in the class, a condition exists that Stephanie Jones (2013) describes as *normalized class privileged lives*.

So How Does This Condition Translate in Schools?

Sometimes brave new world discourses couched in research appear in the media. For example, three quarters of children have access to mobile devices at home. The number of children who have used mobile devices has nearly doubled since 2011. The average daily use of mobile devices has tripled from 5 to 15 minutes a day (*Zero to Eight: Children's Media Use in America*, 2013). The list of statistics and technology use can go on and on, but these are demographics and *people* are left out of these numbers.

At other times, a more thoughtful approach to confronting the digital divide involves forming study groups in schools. These groups tackle here-and-now issues, such as identifying resources for implementing 1:1 programs where every child has a laptop or tablet. If school district budgets are not up to that challenge, a common practice is to identify funding programs external to the school. For example, technology donor funding programs, digital wish grants, and private organizations such as Computers Recycling Center (Positive Learning, 2016).

While action-focused study groups provide one way of confronting the digital divide, there are other ways in which school study groups can zero in on assumptions made about students coming from low-socioeconomic families. Braverman's (2016) article in *Literacy Today* points to the danger in avoiding internet use entirely. Such avoidance only widens the gap between the "have and have nots/can and cannots." Moreover, when children have no access at home and no experience with the web in class, the potential for an even larger disparity looms. As Braverman (2016) explains, "Teachers are often left struggling to reach students who lack the basic foundations needed to develop digital literacy skills—that is, the ability to not only use

devices, but also to fully experience online opportunities and engage in interactions that foster critical thinking about their content and the world around them" (p. 1).

What Does Research Say About the Digital Divide?

First, it is important to acknowledge that most research conclusions are based on the relationship between low-socioeconomic status and a lack of access to the internet and technology in general. However, there are other equally confounding issues. These have to do with the notion that academic literacies and technology use are equivalent to effectively mobilizing digital, multimodal texts online. By "academic literacies" (Lea & Street, 2006), we are referring to the types of literacy practices that students learn in school, such as working across different genres (e.g., narrative, informational, argumentative) and informal writing and production that crosses different domains (e.g., blogs, Instagram, YouTube, gaming). The more exposure and practice children have with multiple genres and registers (e.g., moving from vernacular writing and production on social media and blogs to essay or narrative writing), the more likely they are to gain both competency and confidence in dealing with twenty-first century texts in an ever-changing world.

To our way of thinking, the most promising research is that which focuses less on technology as tools and more on digital texts as types of literacy practices. For such practices are at the very core of learning and resilience building (Gutiérrez, 2016). They are also central to children's understanding of the differences between screen-based writing, reading, thinking, and more traditional forms of literacy. Or, as Dolan (2016, p. 25) puts it, "Students' literacy practices can be conceptualized as borderzones—'spaces where [young people's] out-of-school literacies connect with, and can potentially inform in-school literacy learning' (Skerrett & Bomer, 2011, p. 1257)."

Conceptualized yet another way, digital literacy practices capture at least a portion of what the New London Group (1996) refers to as multiliteracies—those ways of knowing and performing that are available to some but denied to others in the digital divide. Naming aside, they focus less on the *stuff* of technology (the tools themselves) and more on the knowledge work that results from them.

Critiques of the So-Called Digital Divide

One might argue that some ideas associated with the digital divide merit a second look, rethinking, and perhaps even debunking. Controversial as this might seem, there is merit to looking on both sides of a coin, especially when doing so could have an impact on teachers' classroom practices and children's lives.

Digital divide research focuses on socio-economic status as well as other factors such as gender and ethnicity. For instance, there is research that has concluded that male students seem to have better technology skills than females and that analyzes the effects that their parents have on such skills. Ritzhaupt, Liu, Dawson and Barron (2013) have broken the digital divide into three stages which are: a) the equitable access to hardware, software, the Internet, and technology support within schools; b) how frequently students and teachers are using technology within the classroom and for what purposes they are using technology; and c) whether the student users know how to use Information and Communication Technology (ICT) for their personal empowerment (p. 293). As well and importantly, there are parts of the world where more expensive technologies like smart phones and tablets are simply not accessible and more basic mobile phones are used for literacy practices (Prinsloo & Rowsell, 2012). For instance, Auld, Snyder, and Henderson (2012) have conducted research with aboriginal children

and their parents using basic mobile phones to complete a variety of literacy practices and to engage in sophisticated communicative practices. There is much less digital literacies research taking place in the developing world which makes it look like new and digital literacies are not alive and well and productively used when they are – only they need to be cast more as place-based literacy practices (Prinsloo, 2005). The Ritzhaupt et al. (2013) research identifies the "brave new world" type of discourses that are strongly associated with first world nations/Global North which often fail to take into account differential access and technological constraints in "third world"/Global South contexts:

> Put simply, the digital divide is multilayered and includes several related dimensions of computer access, usage, and skill. As noted by van Dijk (2006), 'In terms of physical access, the divide seems to be closing in the most developed countries; concerning digital skills and the use of applications, the divide persists to widen.' (Ritzhaupt et al., 2013, p. 221)

Ritzhaupt and colleagues devised two levels of digital divide: "individuals who do not have access **and** individuals who have less opportunity to use these tools for their personal empowerment" (Ritzhaupt et al., 2013, p. 300). These are distinctly different groups that invite a host of other interruptions such as individuals who use social media for activism, individuals who use Wi-Fi access as they can to find out basic or content-based information, students who need to complete their homework – the list of everyday tasks can go on and on because they are so entangled with being human (Rowsell et al., 2016).

Research identifying the gap in "computer access, use, and skill level" between children from low-socioeconomic status and rural living and those from medium to high-socioeconomic status who live in more urban areas are stark and not often foregrounded in articles that celebrate twenty-first century approaches. There is research that states that the children from rural, low-socioeconomic status have lower levels of skills, comprehension and access to necessary technology (Thomas, 2008). These kinds of findings are not connected enough to ways that we should teach "twenty-first century teaching." These gaps can be detrimental to many children's future careers as they try to compete in a technologically advanced society. The digital divide may also lead to lower levels of social advances and poor "academic achievement." Thomas' (2008) research puts the responsibility for eliminating said-gap on the teachers as there needs to be higher standards and more funds devoted to ensuring that all students receive equal and fair access and assistance with technology (Thomas, 2008). Thomas claims that "when weighing economic and educational considerations, it becomes evident that schools must assume the responsibility for closing at least some of the knowledge portion of the remaining digital divide" (p. 14). We believe that a policy focus should move from giving or supplying tools to a push for critically framing what twenty-first century literacy skills are and how classroom practices can change to provide access to more multimodal, digital ways of knowing. That is, focus more on the practices and resilience of contemporary literacy with technology and less on the stuff or tools used to teach and learn literacy.

Adding to this mix are studies that focus largely on mobile internet use that both affirm and disrupt discourses at the same time. Affirmation comes in noting trends that suggest ownership of mobile devices by older teens does not vary significantly along racial, ethnic, or socioeconomic lines:

> Smartphones are gaining teenage users. Some 23% of all those ages 12-17 say they have a smartphone and ownership is highest among older teens: 31% of those ages 14-17 have a smartphone, compared with just 8% of youth ages 12-13. *There are no differences in ownership of smartphones versus regular cell phones by race, ethnicity, or income*. (Lenhart, 2012, para. 11, emphasis added)

However, most school assignments (e.g., essays, longer narratives, science lab reports) cannot be easily completed on a smartphone. Thus, statistics showing a narrowing of the digital divide fail to take account of young people's education needs and they should therefore be viewed critically. As should research reported by Rubinstein-Ávila and Sartori (2016) that suggests education attainment is negatively correlated with *cell-mostly* users. In other words, individuals deemed making less progress are more likely to connect via their cell phones than individuals with higher educational attainments.

Finally, Livingstone and Helsper (2007) argue that there are very few children who do not use the internet, unlike their parents and adults in general, making the simple assertion of a binary divide between haves and have-nots, or users and non-users, no longer applicable to young people. However, this is not to say that issues of access are no longer relevant, for the findings reveal inequalities by age, gender, ethnicities and socioeconomic status in relation to their quality of access to and use of the internet. Boys, older children and middle-class children all benefit from more and better quality access to the internet than girls, younger and working-class children. These authors found that internet use is hardly a goal in itself. They agree with the implicit yet widespread policy assumption that basic use makes for a narrow, unadventurous, even frustrating use of the internet, while more sophisticated use permits a broad-ranging and

confident use of the internet that embraces new opportunities and meets individual and social goals.

Creating More Robust and Nuanced Language for the Digital Divide

To extend this line of thinking, there have been efforts by researchers to develop a more robust language of description for digital divide issues. For instance, there has been research that nuances the argument of "have and have nots." Valadez and Duran (2007) discuss instead "a multidimensional view of the 'divide'" that broadens the concept of 'access' to include not only whether teachers have physical access to technology and technological infrastructures that take down firewalls and that allow full Wi-Fi, but what they do so when they are on-line. This view of access describes how teachers use computers to support instruction, the social consequences of internet use, "including skill development, communication, and building social networks" (Valdez & Duran, 2007, p. 38). Valdez and Duran's article discusses race and socioeconomic gaps between three elements (which relate to the changing of the traditional definition for digital divide): a) Motivation: "the willingness of individuals to use technology and to include it in their home, work and educational efforts"; b) Possession: a more concrete definition of access including physical access to digital texts and the ability to use the technology; and c) skills: "the ability to use the technology, and the degree of support available to instruct individuals in its use" (Valdez & Duran, 2007, p. 33). Like Dolan (2016), Valdez and Duran talk about "an overstatement of the digital divide framework and that an account of gaps in access in social as well as technical terms" (Valadez & Duran, 2007, p. 33).

Warschauer (2011) discusses and debunks the traditional definition of "digital divide" by changing and adding what he believes to be essential elements. The definition he

has chosen is instead, "social stratification due to unequal ability to access, adapt, and create knowledge via use of information and communication technologies (ICT)" (p. 5). Warschauer explains that the "divide" is not just who has and who does not have the physical technology software, but rather the gap between students with access to assistant, knowledge, and productive digital habits and those who do not. Much of this gap, he says, comes from a lack of teaching low socioeconomic class students necessary technology skills due to a lack of resources, or assumed lack of home resources. He claims, "as examples from these three schools show, overcoming the digital divide involves much more than mere provision of a computer or an internet account. Rather, it involves the mastery of new forms of meaning-making involving multiple media, languages, and genres. These in turn are learned through dynamic engagement in communities of practice addressing relevant social concerns" (Warschauer, 2011, p. 15). To us, a more productive direction for literacy research and practice involves these dynamic engagements with digital texts pushing for critical understandings, experimentations, and perhaps even more collaborations between schools and media and creative arts professionals (Rowsell, 2013).

Ways Forward and Shifting Mindsets

While the digital divide is a present and disturbing reality today, there are several steps that we can take as a field to confront this trend to ensure that all children have equitable and powerful access to digital technologies and high quality instruction. First and foremost we must be vigilant in our assertions that there is no excuse for the digital divide in schools and we must continue in our unyielding advocacy for an equitable and humane distribution of digital resources in schools which might include: funding for ongoing teacher learning vis-a-vis digital literacies and funding for meaningful and consistent access to current tools and technologies.

Additionally, given that children spend much of their time outside of school we must also advocate for funding for out of school time programs. This might include increasing digital access in local libraries and community centers and creating programs that allow more access to digital tools and digital learning for whole families. Third, we need to ensure that we are using digital tools critically in our classrooms and providing all students access to learning that will make them more informed and reflective consumers, producers, and distributors of digital content. Finally, we must all be working across national boundaries collaborating with teachers and parents in other nations to ensure access to robust digital teaching and learning and we should be diligent about sharing research and practice. Together we can work effectively to end the digital divide for all of our children.

For children and young people, it seems, the more literacy, the more opportunities are taken up. With the arrival of increasing genres and formats of digital technologies, Kress (2010) suggests that we need fresh thinking about literacy and the emergence of new social practices surrounding electronic media, digital/photography and mobile phone technology. Other scholars note that youth uptake of informal forms of writing in online contexts is part of a broader set of social and cultural shifts in the status of printed and written communication (Ito et al., 2009). There have been efforts to reframe what writing is in an age of multimodal compositions and with a world filled with digital artifacts and multiple modes and media available for communication across multiple symbolic systems (Stornaiuolo, Hull, & Nelson, 2009). Significantly, an affordance of this change is the emergence of new forms of digitally mediated communication and the increasing prevalence of multimodal literacies that draw on diverse modes (Kral, 2011). It is certainly not the case that all young people are necessarily tech-savvy or, if they are, that they are so in the same ways and to the same degree.

There are researchers who have identified connections between affect, emotional engagement and technologies. As educators, this means speaking to students' emotional and affective attachments and connecting them with media and technology consumption *and* production. Kim and Kim consider "distributed emotion and cognition as the premise" of design processes (Kim & Kim, 2010, p. 15). In short, meaningful learning with technologies should speak to a learner's affect and emotions. As they describe it, "technology has vast possibilities to open doors to relational meanings of various kinds of meanings" (Kim & Kim, 2010, p. 15). Kim and Kim talk about working alongside learners as design partners and as they produce objects or multimodal texts that elicit emotional responses as resources. Kim and Kim push for two main strategies with technology teaching to create equity and common goals for learners: one is relational meanings that are situated within larger structures of practice such as an understanding of "production practices" and the second is emotional experiences as resources to engage in activities (Kim & Kim, 2010).

Another insight garnered from research in the learning sciences is shifting mindsets from teaching with technologies to having students create and design with technologies (Tan, Kim & Yeo, 2009). The sticky issue here is that so many young people who live in poverty do not have all of the technology and media trappings to create and design at home. Hence, there needs to be an increase in opportunities to make, produce, create, and design. Tan, Kim and Yeo (2009) encourage an apprenticeship model of learning whereby learners work collaboratively with educators to build knowledge and to produce "cultural artifacts" (Tan, Kim, & Yeo, 2009). They speak of epistemic agency as an indicator or confidence with technology and design to take on the responsibility of inquiry work and what Rowsell has witnessed as autodidact habits (Rowsell,

Maués, Moukperian, & Colquhoun, In Press). What often drives this kind of epistemic agency is emotional investment and self-driven interest in topics. Literacy teachers take a back seat to such inquiry work by modelling, coaching, and scaffolding, but with much less direct instruction. Researchers even recommend bringing in professionals like game designers or graphic designers to teach technology and production skills and competencies (Rowsell, 2015). Taking more of a participatory approach to technology use fosters more of a partnership feel to classrooms and more collaboration between teachers and learners.

Hargittai (2003) considers how information about access and use statistics are not refined enough measures to explore all the ways in which differentiated internet use may contribute to social inequality. What research needs to look at is how access to digital worlds enhances people's life chances. Simply being connected will not necessarily solve all potential sources of inequality, and so studies of more nuanced uses of the web are important as internet use spreads to an increasing portion of the population to encourage the diffusion of the medium's use across different population segments.

In a study conducted in a remote indigenous context in Australia, Kral (2014) showed how identities and perceptions have shifted across the generations about digital worlds and digital literacies and how this shift is intertwined with the evolution of communication technologies in this setting. Kral's study has shown that where access is provided, youth have shown themselves to be rapid adopters of new technologies and active content producers, just as the generation before them were adept at transforming early media technologies for their own social and cultural purposes. Through the artifacts of new media – laptops, digital cameras and mobile phones – young people are embracing global digital youth culture and exploring the

generativity of multimodal forms of communication, while simultaneously acting as agents for the recording and transmission of cultural memory in new forms.

Interest in technology focuses on a number of areas. First and most obviously, is the technology itself, and the range of hardware and devices available – laptops, mobile phones, tablets and the like. Second are the diverse platforms and spaces where activity takes place – sites such as Facebook, Flickr, YouTube, and games-related forums and chat sites. A third addresses the ways digital culture is experienced, a fourth the ways in which knowledge and authority may be transformed, and a fifth, the dispositions towards learning that might be fostered through participation online (Beavis, 2013a). Access to technology, and immersion in digital culture, it is argued, develop new expectations and orientations towards learning – new dispositions and new views of matters as diverse as authorship, knowledge and authority; and of ownership and autonomy (Lankshear & Knobel, 2007).

Kral (2011) looked at the acquisition of youth media practice as a social and cultural process within the dynamic of social change by focusing on aspects of changing modes of communication and performance within one socio-historical context in remote Indigenous Australia. He focused on a group of young people who are not only participating in the production of new cultural forms using media, but also reflecting on what is going on for them. He highlighted the manner in which they are deftly threading and weaving intercultural symbols, images and messages into their new cultural productions, revealing pride in their Indigenous cultural heritage. As part of the findings of his studies, he has shown that through new media, young people are taking up the challenge of global citizenry more than any other generation before them. In this way they are interpreting and responding to their positions with creative

agency in a manner similar to youth in other international contexts (Hull & Stornaiuolo, 2010).

Beavis (2014) warns us that as with all popular culture and engagement with textual forms, however, bringing leisure time uses of digital culture and ICT into the classroom does not translate easily or readily. Game play and the other digital cultural platforms and forms are socially situated and socially specific, shaped by the context in which they are played and linked to a variety of individual and communal purposes that may have little to do with school. Further, in addition to the constraints imposed on the use of ICT and technology in the classroom by access and availability, and the need for such use to be incorporated into existing curriculum and pedagogical and assessment regimes (or at least, to be congruent with them), it is also important to avoid assuming that out-of-school practices and values will be unproblematically transferred into the classroom.

Beavis (2013b) also makes the point that in education, the need to address contemporary lives, contemporary media, and to build connections between education's traditional priorities and concerns is pressing. Doing so, however, requires an open and exploratory frame of mind, an awareness of the situated and contextual nature of learning, and a detailed and nuanced picture of the diversity of young learners, and of their needs.

Creating Cultures of Consumption *and* Production

There are so many creative, spontaneous forms of expression online that have become tacit for younger generations. There is research that demonstrates a marked differential between a sole consumption of media and digital texts and consumption that leads to multimodal, media-driven productions (Soep, 2006). These are different versions of technology use where one

(consumption and production) requires more access, more technologies, and more software. Often, children, adolescents and teenagers living in poverty are limited to the consumption of goods and practices rather than the production – simply because they do not have the technologies necessary for production work. There are ways to plan activities for all students to consume, make, play and produce with modes such as visuals (e.g., create your own avatar and write a biography for it), sounds (e.g., analyze music videos) to engage in spontaneous, generative creativity. Critical framing of media and digital texts across genres from game-based platforms like *Minecraft* to academic registers like *The New York Times* fosters more expansive understandings of media and digital worlds. Educators can and should create maker spaces by providing the technologies, resources, and materials to make texts and objects through experimentation and problem-solving (Halverson & Sheridan, 2014; Peppler & Bender, 2013). Try as much as possible to use document sharing platforms like Google classroom to save and share documents. Finally, educators can establish collaborative communication and participatory structures such as blogs, wikis, and the like so that students can comment on each other's work and students can develop interactive approaches to content and design.

Reflecting back on our question at the beginning of the article: are young people's positions as literacy learners limited by a lack of access to technology? After a survey of extant research, we believe that yes, young people's positions as literacy learners are indeed limited by a lack of both access and framing of digital literacies and this article offers teachers, administrators and researchers a beginning view of how the educational community can start to close the digital divide.

Take Action!

1. Unyielding advocacy for and equitable and humane distribution of resources which involves:
    a. Funding for ongoing teacher learning vis-a-vis digital literacies.
    b. Funding for meaningful and consistent access to current digital tools and technologies (i.e. devices, connectivity, support).
    c. Funding for access for populations who do not have digital literacies affordances (technologies, Wi-Fi, etc.).
2. Funding for out of school time programs – kids spend most of their time out of school. Literacy educators and organizations like the International Literacy Association (ILA) need to push for access in libraries, community centers, etc. Specifically, this involves:
    a. Funding for more robust connectivity in public places.
    b. Family access to technologies.
3. Digital literacy pedagogy as access to digital consumption, production and distribution which entails:
    a. Thinking beyond the paradigm of access as uncritical consumption. Students need the opportunity to critically evaluate corporate media production. Classrooms can help students to ask tough questions of the TV shows, Internet sites, magazines, and mobile applications that they encounter on a daily basis.
    b. Students engaged in literacy work, in classrooms, that allow them to be makers, producers, and distributors via digital technologies. Students, for example, can use digital technologies to share about their own values and ideals and they can

use their digital literacies to take social action on issues that are important to them.

   c. Students becoming digital "inventors" where they have space in their classrooms to invent new digital technologies (for examples look at movements like #YesWeCode).
   d. Teachers as watchers of and learners from students and youth culture.

4. ILA as a critical, collaborative, international advocate for equitable digital access for all students inside and outside of schools which pushes for:
   a. Working with and learning from other nations about innovative policies and practices that ensure digital equity.
   b. Collective engagement with governments and technology corporations to provide access to tools and expertise for all students.
   c. A culture of shared research and practice.

References

Auld, G., Snyder, I., & Henderson, M. (2012). Using mobile phones as placed resources for literacy learning in a remote Indigenous community in Australia. *Language and Education*, *26*(4), 279-296.

Beavis, C. (2013a). Multiliteracies in the wild: Learning from computer games. In G. Merchant, J. Gillen, J. Marsh, & J. Davies (Eds.), *Virtual literacies: interactive spaces for children and young people* (pp. 57-74). London, UK: Routledge.

Beavis, C. (2013b). Literary English and multimodality: The aesthetic, the literary and diversity of form. *Changing English, 20*(3), 241-252.

Beavis, C. (2014). Games as text, games as action: Videogames in the English classroom. *Journal of Adult and Adolescent Literacy, 57*(6), 433-439.

Braverman, B. (2016). The digital divide: How income inequality is affecting literacy instruction, and what all educators can do to help close the gap. *Literacy Today, 33*(4), 16-20.

Dolan, J. E. (2016). Splicing the divide: A review of research on the evolving digital divide among k-12 students. *Journal of Research on Technology in Education, 48*(1), 16-37.

Gutiérrez, K. (2016). Designing resilient ecologies: Social design experiments and a new social imagination. *Educational Researcher, 45*(3), 187-197.

Halverson, E. R., & Sheridan, K. M. (2014). The maker movement in education. *Harvard Educational Review, 84*(4), 495-504.

Hargittai, E. (2003). The digital divide and what to do about it. In D. C. Jones (Ed.), *New economy handbook* (pp. 821-839). San Diego, CA: Academic Press.

Hull, G. A., & Stornaiuolo, A. (2010). Literate arts in a global world: Reframing social

networking as cosmopolitan practice. *Journal of Adolescent and Adult Literacy, 54*(2), 84-96.

Huxley, A. (1932). *Brave new world*. New York: Harper & Brothers.

Ito, M., Baumer, S., Bittanti, M., boyd, d., Cody, R., Stephenson, B. H., . . . Tripp, L. (2009). *Hanging out, messing around, and geeking out: Kids living and learning with new media*. Cambridge, MA: MIT Press.

Jones, S. (2013). Critical literacies in the making: Social class and identities in the early reading classroom. *Journal of Early Childhood Literacy, 13*(2), 197–224.

Kim, B., & Kim, M. S., (2010). Distributed emotions in the design of learning technologies. *Educational Technology*, *50*(5), 14-19.

Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. London, UK: Routledge.

Kral, I. (2011). Youth media as cultural practice: Remote indigenous youth speaking out loud. *Australian Aboriginal Studies, 1*, 4-16.

Kral, I. (2014). Shifting perceptions, shifting identities: Communication technologies and the altered social, cultural and linguistic ecology in a remote indigenous context. *The Australian Journal of Anthropology, 25*(2), 171-189.

Lankshear, C., & Knobel, M. (2007). *New literacies: Everyday practice and classroom learning* (Second ed.). New York, NY: Open University Press.

Lea, M. & Street, B. V. (2006). The "academic literacies" model: Theory and application. *Theory into Practice, 45*(4), 368-377.

Lenhart, A. (2012). *Teens, smartphones and texting*. Washington, DC: Pew Internet & Life

Project. Retrieved 8/14/14 from http://www.pewinternet.org/Reports/2012/Teens-and-smartphones.aspx

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New Media and Society, 9*(4), 671-696.

New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review, 66*(1), 60-92.

Peppler, K. A., & Bender, S. (2013). Maker movement spreads innovation one project at a time. *Phi Delta Kappan, 95*(3), 22-27.

Positive Learning. (2016, February 11). Seven ways to get funding and grants for technology in your classroom. Retrieved 1/30/17 from https://positivelearning.com/blog/2016/2/11/7-ways-to-get-funding-and-grants-for-technology-in-your-classroom

Prinsloo, M. (2005). The new literacies as placed resources. *Perspectives in Education, 23*(4), 87-98.

Prinsloo, M. & Rowsell, J. (2012). Introduction: Digital literacies as placed resources in the globalised periphery. *Language and Education, 26*(4), 271-277.

Ritzhaupt, A. D., Liu, F., Dawson, K., & Barron, A. E. (2013). Differences in student information and communication technology literacy based on socio-economic status, ethnicity, and gender: Evidence of a digital divide in Florida schools. *Journal of Research on Technology in Education, 45*(4), 291-307.

Rowsell, J. (2013). *Working with multimodality: Rethinking literacy in a digital age*. London: Routledge.

Rowsell, J. (2015). What professionals can teach us about education: A call for change. *Cambridge Journal of Education, 46*(1), 81-96.

Rowsell, J. With Burke, A., Flewitt, R., Han-Teng, L, Lin, A., Marsh, J., Mills, K., Prinsloo, M., Rowe, D., & Wohlwend, K. (2016). Humanizing digital literacies: A road trip in search of wisdom and insight. *The Reading Teacher*, 70(1), 121-129.

Rowsell, J., Maués, F., Moukperian, S., & Colquhoun, C. (In Press). iPads and autodidacts: Capturing reading processes and practices on iPads. In C. Burnett, G. Merchant, A. Simpson, & M. Walsh, (Eds.), *Mobile Literacies: The Case of the iPad in Education.* New York: Routledge.

Rubinstein-Ávila, E. & Sartori A. (2016). Diversification and nuanced inequities in digital media use in the United States. In B. Guzzetti & M. Lesley (Eds.). *Handbook of research on the societal impact of digital media* (pp. 560-580). Hershey, PA: IGI Global.

Skerrett, A., & Bomer, R. (2011). Borderzones in adolescents' literacy practices: Connecting out-of-school literacies to the reading curriculum. *Urban Education, 46*(6), 1256-1279.

Soep, E. (2006). Critique: Assessment and the production of learning. *Teachers College Record 108*(4), pp. 748-777.

Stornaiuolo, A., Hull, G. A., & Nelson, M. E. (2009). Mobile texts and migrant audiences: Rethinking literacy and assessment in a new media age. *Language Arts, 86*(5), 382-392.

Tan, S., Kim, B., & Yeo, J. (2009). Learning with technology: Learner voice and agency. *Educational Media and Technology Yearbook, 35*, 1-18.

Thomas, D. (2008). The digital divide: What schools in low socioeconomic areas must teach. *The Delta Kappa Gamma Bulletin, 74*(4), 12-17.

Valadez, J. R., & Duran, R. (2007). Redefining the digital divide: Beyond access to computers and the internet. *High School Journal, 90*(3), 31-44.

Warschauer, M. (2011). A literacy approach to the digital divide. *Cadernos de Letras, 28*, 5-18.

Zero to Eight: Children's Media Use in America. (2013). A Common Sense Media Research Study. Retrieved from https://www.commonsensemedia.org/research/zero-to-eight-childrens-media-use-in-america-2013

More to Explore

Adams, R. (2016). Students who use digital devices in class 'perform worse in exams'. Available at https://www.theguardian.com/education/2016/may/11/students-who-use-digital-devices-in-class-perform-worse-in-exams

A reading conference: Teaching intertextuality to a student (5-8). Available at https://vimeo.com/55957323.

Education World. (2016). Tech tips for tots. Available at http://www.educationworld.com/a_tech/tech/tech215.shtml

McLaughlin, C. (2016). The homework gap: The 'cruelest part of the digital divide'. *NEA Today.* Available at http://neatoday.org/2016/04/20/the-homework-gap/

Tech Savvy Tots Closing Digital Divide (2015). Available at https://www.youtube.com/watch?v=BZSjuuY-qCI

Tech-Savvy Tots Talk to Cyber Santa. (2014). Available at http://www.wsj.com/articles/tech-savvy-tots-talk-to-cyber-santa-1419202254

The Conversation. (2016). Many low-income students use only their phone to get online. What are they missing? Available at http://theconversation.com/many-low-income-students-use-only-their-phone-to-get-online-what-are-they-missing-54213