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**How Students Access, Filter, and Evaluate Digital News: Choices That Shape What They Consume and the Implications for News Literacy Education**

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### **Abstract**

Being a discerning news consumer in the digital age requires an ability to wade through a torrent of online content to find credible and diverse information from trustworthy sources. This mixed-methods study examines how students ( $n = 37$ ) at a large U.S. public university access, filter, and evaluate news about a topic of interest in an open-web setting, and measures participants' awareness of their choices that shape what news they consume. Concurrent think-aloud verbal protocols and subsequent semi-structured interviews revealed that students relied heavily on news sources that aggregate content, and trusted their social networks and technology to filter news. They often relied upon cognitive heuristics and lacked awareness of the strategies and evaluation criteria that potentially affect the credibility and diversity of news consumed. Theories of cognitive processing and communication flow help frame the implications for news literacy education and research.

### **Keywords**

Cognitive heuristics; interpersonal networks; news credibility; news literacy; journalism studies

Being a discerning news consumer in the digital age requires an ability to wade through a torrent of online content to find credible and diverse information from trustworthy sources. Doing so requires conscious awareness of the search strategies and evaluation criteria used when accessing and assessing news. However, constant connectivity and information overload often lead people to rely on cognitive heuristics – mental shortcuts used to make quick judgments – and automatic routines rather than consuming news with a critical eye.

Critically examining messages produced by the media is a core tenet of media literacy (Bulger & Davison, 2018), a central component of literacy research (Livingstone, Van Couvering, & Thumin, 2008). News literacy, often considered an offshoot or subset of media literacy (Mihailidis, 2012), examines how news “works,” including the media and technological systems that support certain meanings embedded in media texts and the creative process that yields them (Reese, 2012). This study defines news literacy as demonstrating the critical thinking skills and awareness necessary to access, filter, and evaluate credible news from diverse sources.

Recent efforts to refine news literacy education have focused on developing learning outcomes, experimenting with instruction, and creating assessment tools (Beyerstein, 2014; Bulger & Davison, 2018). Assessments often measure students’ ability to critically evaluate messages before and after exposure to news literacy lessons. Teachers or researchers – rather than the students themselves – select the media messages used in assessments. Studies rarely measure the cognitive strategies used by students during their typical online information seeking and filtering routines (Hargittai, Fullerton, Menchen-Trevino, & Thomas 2010). Students need to think critically not only when presented with news to evaluate but when independently searching for and selecting news in a real-world setting.

This mixed-methods study contributes to the understanding of the strategies and criteria applied during the news seeking and evaluation process. It examines how students ( $n = 37$ ) at a large U.S. public university access, filter, and evaluate news about a topic of interest in an open-web setting, and measures participants' awareness of their choices that shape what news they consume. Concurrent think-aloud verbal protocols, a method of gathering detailed qualitative data about cognitive aspects of reading, and subsequent semi-structured interviews revealed that students relied heavily on news sources that aggregate content, and trusted their social networks and technology to filter news. They often relied upon cognitive heuristics and lacked awareness of the strategies and evaluation criteria that potentially affect the credibility and diversity of news consumed. Theories of cognitive processing and communication flow help frame the implications for news literacy education and research.

This study begins by examining literature on how young adults access, filter, and evaluate online news, including mental shortcuts taken to limit information overload and the influence of interpersonal networks and algorithms. It continues with an overview of news literacy assessments and how this study's naturalistic approach differs from previous research.

## **Literature Review**

### **Accessing and Filtering Online News**

The vast majority of young adults in the United States are daily news consumers who say that keeping up with news is important to them (Media Insight Project, 2015). Their pathways to news include a blend of seeking it out and letting it find them through social (e.g., Facebook, Twitter, traditional word-of-mouth), curated (e.g., search engines, aggregators, and blogs), and reportorial media (e.g., legacy and digital-only publishers) (Media Insight Project, 2015). U.S. young adults most commonly access news through peer discussions or on social media, followed

by news websites/apps, television, radio, and print (Head, Wihbey, Metaxas, MacMillan, & Cohen, 2018; Shearer, 2018).

Worldwide, nearly two-thirds of people prefer to get news through a “side door” rather than going directly to a news website or app, and just over half prefer to access news through interfaces that use ranking algorithms to select stories (e.g., search engines, social media, or news aggregators) rather than interfaces driven by humans (e.g., homepages and mobile notifications). Young adults are the most likely of any age group to use social media and search to access news (Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2018).

Through observing participants – including but not limited to college students – reading a national news site, Tewksbury, Hals, and Bibart (2008) identified two main types of news consumers: “selectors” (who focus on specific content defined by individual interests and needs) and “browsers” (who use the news media to find information on a broad range of topics across news domains). Antunovic, Parsons, and Cooke (2018) identified a three-stage process of news consumption among college students: routine surveillance (the intentional and ritualized practice of scanning news websites/social feeds or receiving news alerts), incidental consumption (serendipitous news encounters), and directed consumption (seeking out additional information about a specific news story). These stages overlap and build on each other, leading to a complex process through which young adults keep up with news (Antunovic, Parsons, & Cooke, 2018).

Accessing online news involves cognitive processing decisions about what information to pay attention to and ignore, and then evaluation of the information found (O’Brien, 2011). Increased news exposure is positively associated with feeling overloaded (York, 2013), and cognitive demands increase as more articles are presented to online readers (Wise, Bolls, & Schaefer, 2008). More than two-thirds of U.S. college students report that the amount of news

available to them is overwhelming and find the “fire hose of news” frustrating (Head, Wihbey, Metaxas, MacMillan, & Cohen, 2018). Metacognitive awareness helps readers successfully navigate and make sense of online content, and is likely to foster a deeper understanding of texts they encounter (Coiro, 2011). Designing educational interventions is difficult unless researchers know more about metacognitive processing during interactions with a range of texts (Denton et al., 2015; Potter, 2004b).

Dual-process theories suggest that people make sense of their environment in both conscious and automatic ways, mixing effortful and effortless processing depending on the context (Bellur & Sundar, 2016). Potter’s (2004a) cognitive theory of media literacy postulates that when interacting with media, people are flooded with information, and as a defense mechanism remain in a mostly unconscious state in which their attention is governed by automatic routines. Automaticity allows users to quickly sift through digital content and avoid information overload, but it may narrow their online experience and weaken their ability to construct meaning and think critically (Potter, 2004a). Becoming media literate requires overriding automatic routines and activating higher-order thinking strategies (Potter, 2004b).

Because systemically processing message content is time consuming and cognitively demanding, web users commonly rely upon heuristics (Metzger, Flanagin, & Medders, 2010; Rieh & Hilligoss, 2008), quick strategies for filtering online information and assessing its credibility (Metzger & Flanagin, 2013). The following section describes these heuristics in detail and other ways in which people use cues to evaluate news credibility.

### **News Credibility Evaluation**

Determining credibility in the digital age is made difficult by the low barrier of entry to publishing online, a lack of gatekeepers to monitor quality, the convergence of information

genres such as news and advertising, and the flattening effect that seemingly puts all content on an equal playing field (Flanagin & Metzger, 2007; Metzger, 2007). Young web users are particularly challenged in identifying credible information, placing them at greater risk for falsely accepting a source's self-asserted credibility (Flanagin & Metzger, 2008). They commonly rely on sources that are convenient, even if they do not consider them credible (Jarvis, Stroud, & Gilliland, 2009; Kohnen & Saul, 2017).

Researchers often measure how web users assess source, medium, and message credibility (Armstrong & Collins, 2009). Source evaluations can be based on surface credibility (cursory inspection of superficial characteristics) or experienced credibility (firsthand experience with a source) (Tseng & Fogg, 1999). Credibility indicators commonly include authority, currency, objectivity/bias, factuality, and trustworthiness (Metzger, 2007). Message credibility, in the context of news, can be measured by asking news consumers about accuracy, authenticity, and believability (Appelman & Sundar, 2016).

Hilligoss & Rieh (2008) found that students make credibility judgments by forming definitions (e.g., truthfulness, believability, trustworthiness); applying heuristics to a variety of situations; and interacting with specific content cues (the message itself), peripheral cues (eg: affiliation and reputation of the source or institution; past experience with a source), and object cues (eg: aesthetics or presentation of information). In an online experiment in which thousands of people evaluated a range of web sites (including news sites), Fogg (2003) found that credibility judgments usually were based on visual cues such as design and navigability rather than content or source information.

Cues found in sources, mediums, or messages hold the potential to trigger heuristics (Bellur & Sundar, 2016). Among these mental shortcuts used to evaluate credibility are the



“reputation heuristic,” a reliance on the name recognition of websites (Metzger, Flanagin, & Medders, 2010) – found to be the most important cue when people determine what news sources to read (Winter & Kramer, 2014). Students often perceive popularity, one measure of reputation, as a form of endorsement, believing that information sources that are widely used are more likely to be credible (Hilligoss & Rieh, 2008). Other commonly used heuristics include the “source heuristic,” taking cues about whether a source is familiar or unfamiliar; the “authority heuristic,” trusting people or institutions in positions of power – a concept also known as reputed credibility (Tseng & Fogg, 1999); and the “endorsement heuristic,” perceiving information or sources as credible if endorsed, recommended, or otherwise upheld as knowledgeable by trusted individuals (Hilligoss & Rieh, 2008; Metzger, Flanagin, & Medders, 2010).

Jessen and Jorgensen (2012) argued that with the rise of social media, online users pay less attention to the authority and perceived expertise of the sender of information and more attention to social feedback and collective judgment when evaluating credibility. Their “aggregated trustworthiness” theory suggests that users collect multiple streams of trustworthiness cues, including large-scale social validation (e.g., comments, likes, and shares), profiles (e.g., a person’s Twitter stream or personal website), and authority and trustee (being a known brand or authority) (Jensen & Jorgensen, 2012). Their theory is based, in part, on research showing that young adults gather credibility cues from a range of sources, including but not limited to experts (Hargittai, Fullerton, Menchen-Trevino, & Thomas, 2010).

Web users frequently outsource credibility assessment (Taraborelli, 2008) to the crowd’s wisdom or to websites that aggregate news (Hargittai, Fullerton, Menchen-Trevino & Thomas, 2010). News consumers’ trust in sources that algorithmically select news stories is known as the “machine heuristic” (Sundar, Knobloch-Westerwick, & Hastall, 2007). College students consider

news digests (curated by algorithms and humans) as “trusted gatekeepers” that filter and identify the most important stories (Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2018).

Some of the above phenomena are encapsulated in the two-step flow model of communication, in which ideas flow first from the mass media to opinion leaders, and from opinion leaders to the broader public (Katz & Lazarsfeld, 1955). Bennett & Manheim (2006) argued that public communication has moved from a two-step to a one-step flow, in which personalized messages reach individuals directly, and the key interactions are between the technology and the individual audience member. Thorson & Wells (2012) incorporated elements of the one-step flow and two-step-flow into their own framework, curation of flows, which considers not only information choices being made by opinion leaders but also peer social curation, individual channel selection habits, and algorithms that deliver customized content. Exposure to media messages is dependent on both individual agency (choosing to read content or participating in a social network) and outside influences (push notifications and algorithms).

Little work in online credibility assessment has considered how the information-seeking process figures into the final evaluation of content people encounter (Hargittai, Fullerton, Menchen-Trevino, & Thomas, 2010). Research participants are often asked to evaluate features of a mock website without regard for how they might come across it in the first place. According to Metzger (2007), “Researchers have suggested myriad factors that may play into credibility assessments, but only a few studies have examined what criteria people actually employ” (p. 2081). Metzger argued that studies should go beyond self-reported information and gauge users’ actual information-seeking behavior. “Future online credibility research should be as anthropological, naturalistic, and unobtrusive as possible” (Metzger, 2007, p. 2087). The

following section describes how researchers have attempted to measure students' ability to evaluate news credibility and critically analyze messages through news literacy assessments.

### **Assessing News Literacy**

Most studies of literacy attainment are quantitative and summative, focusing on what students have learned at the end of a course, unit, or presentation (MacMillan, 2009). Scores on pre- and post-tests measure change in skill or knowledge attainment over time but do not shed light on the reasons for improvement. In news literacy assessments, scholars commonly ask students to evaluate the credibility of news stories that are selected for them, typically from a variety of mediums (e.g., Ashley, Lyden, & Fasbinder; Ashley, Poepsel & Wills, 2010), or to reflect on their attitudinal and behavioral changes after taking a news literacy course (e.g., Maksl, Craft, Ashley & Miller, 2017). Research typically does not examine decisions students make about where to start a news search, and how the search process may affect the credibility or diversity of the news accessed, or influence an individual's assessment of content credibility.

Several studies have used qualitative or mixed methods to examine how college students seek out and assess the credibility of online content (Hargittai, Fullerton, Menchen-Trevino, & Thomas, 2010; Tylor, 2015), make meaning of media messages (Ashley, Lyden, & Fasbinder, 2012), and determine what makes online news engaging (O'Brien, 2011). Research shows that tracking students' literacy skills using direct observation is an effective way to learn about their thought processes, strategies, and evaluation criteria (MacMillan, 2009).

Researchers have used think-aloud protocols to examine how college students interpret and understand text meaning (Denton et. al, 2015) and utilize online reading comprehension strategies (Coiro, 2007), but less attention has been paid to how they process online information and decide what sources to read and trust (Goldman, Braasch, Wiley, Graesser, & Brodwoinska,

2012). Hargittai, Fullerton, Menchen-Trevino, and Thomas (2010) found that the information-seeking process is often as important as verifying the results in terms of assessing the credibility of online content. Yet news literacy assessments tend to rely on scholars' or educators' prescribed treatments (Ashley, Lyden & Fasbinder, 2012) instead of allowing students to choose content to analyze. Pingree (2011) criticized experiments in which students read a news story selected for them as artificial given that "in the real world, people self-select news stories to attend to, making effects on high-interest readers arguably more externally valid than those on low-interest readers" (p. 41). Fleming (2010) found that news literacy lessons are more powerful when students choose the media content they deconstruct.

Cognizant of Metzger's (2007) advocacy of naturalistic studies that go beyond self-reported information, Hargittai, Fullerton, Menchen-Trevino, and Thomas' (2010) observation and analysis of web users' actions from the information-seeking through the credibility evaluation process, and O'Brien's (2011) simulated task scenario and post-task semi-structured interviews, this study builds on previous research by examining how students access and assess news topics of stated interest in an open-web setting. To promote authenticity and increase the likelihood of participant motivation, this study asked students to select news items to analyze. This allowed for an examination of how the information-seeking process may affect the news consumed and factor into students' evaluation of news sources and news items.

This study measures the extent to which students are aware of the strategies and criteria they use during the news search and evaluation process, and how they are influenced by their peers or technology when accessing news. In this study, awareness refers to the ability to identify (with or without prompting) the search strategies and evaluation criteria applied when consuming news. Specifically, this study poses three questions:

*RQ1*: What strategies do students use to filter online news in an open-web setting?

*RQ2*: What criteria do students use to evaluate news outlet credibility?

*RQ3*: What criteria do students use to evaluate news item credibility?

## **Method**

### **Sample**

This study sought out college students with a range of academic backgrounds, as news literacy education typically targets students across disciplines rather than focusing primarily on journalism or communication majors. To recruit a diverse pool, undergraduates at a major East Coast university enrolled in large lecture courses open to all majors, and members of student groups or interdisciplinary residential communities were invited to take part in the study. Participants were evenly split between male (51.4%) and female (48.6%), and were most often underclassmen ( $M = 19.3$  years old,  $SD = 1.12$ ). They were enrolled in a range of colleges, with only 8.6% majoring in journalism and 16.7% having taken a media literacy course.

### **Instrument**

Data sources included concurrent think-aloud verbal protocols, computer screen captures recorded as participants conducted a news search, and subsequent semi-structured interviews. Concurrent think-aloud protocols elicited contemporaneous descriptive data about participants' search and filtering strategies, and criteria for evaluating news outlets and items. Participants verbalized what they thought and did as they completed a task. The think-aloud methodology is well-suited to explore strategic processing of online information and reduce assumptions in analysis of observational data (Afflerbach & Cho, 2009). Its unique contribution is "describing the relations that may exist among sense-making, evaluating, and monitoring processes during reading and how these may influence online navigation decisions" (Goldman, Braasch, Wiley,

Graesser & Brodowkinska, 2012, p. 359). However, there is not always an exact relationship between people's words and their thoughts (Pressley & Afflerbach, 1995), and there are concerns about participants' ability to attend to simultaneous tasks and verbalize normally silent activities (Denton et al., 2015).

Images of the websites participants visited during news seeking tasks were recorded using screen capture software to facilitate semi-structured interviews and to later analyze the news items selected. Interviews provided data about choices students made during their news searches, including the strategies and criteria observed by the researcher but not mentioned contemporaneously by participants.

### **Procedure**

Participants were selected by a computerized random-number generator. Lab sessions involved the researcher and one participant, who sat in front of a desktop computer, keyboard, mouse, and audio recorder used for taping the session. The decision to evaluate computer rather than mobile news searches was made to allow participants to make best use of an open-web setting (rather than being in a walled-in app environment) and to allow the researcher to use screen-capture software to facilitate participant conversations. Although the computer may have been configured differently from a participant's own computer (they were not able to use pre-programmed tabs), this approach controlled for the quality of web connection and software differences, and ensured that all participants experienced similar conditions.

The researcher instructed participants to find credible news (text, audio, or video) on a topic of interest by starting at the website they most often use when beginning a news search. Participants were purposefully given no further instructions about how to conduct the news search because the goal of the study was to take a naturalistic approach by allowing participants

to be guided by their interests and typical news consumption habits rather than impose an artificial constraint such as a task to find specific information.

Participants had five minutes to complete the search and could navigate anywhere on the web to select a news item they considered credible. News was defined broadly as “information about current events or issues.” No definition of credibility was provided so that students could describe their own evaluation criteria. Participants were instructed to verbalize reasons for visiting each news source, how they navigated it, how they made credibility evaluations, and what they considered when selecting or rejecting a news item. To avoid priming participants, the researcher remained silent as participants searched for news, only interjecting if they asked for clarification about the task or were silent for more than 10 seconds. The researcher recorded a screen capture of each step taken by participants – clicking on a link, toggling between news items, opening a new web page, etc. Once participants selected the news item they considered credible, the researcher saved the URL with the screen captures for later analysis. Participants were instructed to close their browser and begin a second news search about a topic of stated interest, following the same instructions except to start at their second-most-often-visited site.

After selecting a second news item, participants took part in semi-structured interviews (Appendix A) that focused primarily on the two searches. The researcher used screen images recorded during each search as a frame of reference for participants to answer questions about search strategies and evaluation criteria. Follow-up questions helped the researcher understand participants’ thought processes while making decisions. To avoid priming participants, the researcher asked only about comments made or actions taken during their news searches.

### **Data Analysis**

Emergent coding was used to analyze qualitative data. During the initial phase of analysis, the researcher reviewed transcripts that included everything participants verbalized during the think-aloud and in subsequent interviews, taking notes about broad themes and patterns. An original coding scheme was developed because no existing scheme adequately measured news consumers' strategies and credibility evaluation criteria. An inductive approach was used to detect and summarize students' strategies and self-awareness of these strategies.

Data were separated into discrete segments that reflect participants' strategic behavior and compared to other segments in order to determine the broader categories to which they belong (Lindlof & Taylor, 2002). O'Brien and Toms (2008) provided the framework for the stages of user engagement with media (point of engagement, sustained engagement, and completion of activity), which were adapted for the purpose of news seeking to include "initial strategy used in news search," "search strategies used to filter news" and "criteria used to evaluate news outlets and items."

Before starting, participants decided whether to conduct a broad search without specific information in mind (coded "information scanner") or search for specific information (coded "information seeker") – terms adapted from Tewksbury, Hals, and Bibart's (2008) information-seeking classifications ("selectors" and "browsers"). Once an initial news search strategy was selected, a variety of strategies for "filtering news," or narrowing down the news items to consider, were employed before opening any news item. All participants expressed some evaluative judgments about the news *outlets* (defined as a journalistic organization that produces original content) they used to begin a search and those they encountered during the course of their task. Actions students took and attributes of a news item they considered in order to



evaluate individual news stories rather than news outlets that produced them are considered news *item* evaluation criteria.

Coders tracked whether participants cited use of a strategy or criteria during the think-aloud task or during the interview.<sup>1</sup> Comments made during the think-aloud protocol were considered the most accurate measures of contemporaneous thinking because they were shared without prompting. Coders noted participant actions taken during the lab search – and recorded by the screen-capture software – that were not mentioned contemporaneously or during the interview. This demonstrated lack of awareness given that no basis exists to presume they were part of a conscious strategy.

Two coders independently coded a randomly selected sample of 10% of the think-aloud and interview transcripts and resolved disagreements in discussion. They coded the remaining protocols, emerging with a .933 intercoder reliability using the Krippendorff's Alpha (KALPHA) test. A KALPHA result of .80 or greater is considered optimal (Hayes & Krippendorff, 2007).

## Results

The majority of news searches (63.5%) began at websites that rely heavily or entirely on aggregated rather than originally produced content (marked with an asterisk below), led by Google (13.5%), Facebook (9.5%), Twitter (9.5%), and Yahoo News (9.5%).

**Table 1: Websites at which participants began news searches**

Website	Searches	Percentage of Searches
Google*	10	13.5%
CNN	7	9.5%
Facebook*	7	9.5%

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<sup>1</sup> The coding sheet tracked whether a participant mentioned a strategy or criteria, but not the number of times it was mentioned. The researcher felt that quantity of a participant's references to a particular search strategy or evaluation criteria was an imprecise metric. Multiple references could simply mean that the researcher asked follow-up questions that elicited repeat responses.

Twitter*	7	9.5%
Yahoo News*	7	9.5%
Reddit*	5	6.8%
Google News*	4	5.4%
BBC News	3	4.1%
New York Times	3	4.1%
Huffington Post	2	2.7%
Instagram*	2	2.7%
The Daily Beast	2	2.7%
Washington Post	2	2.7%
Bleacher Report	1	1.4%
BuzzFeed	1	1.4%
ESPN	1	1.4%
MSN*	1	1.4%
Newser*	1	1.4%
Newsweek	1	1.4%
NPR	1	1.4%
Pinterest*	1	1.4%
Politico	1	1.4%
Real Clear Politics*	1	1.4%
Student Newspaper (name withheld)	1	1.4%
Tumblr*	1	1.4%
Yahoo Search*	1	1.4%
<b>TOTAL:</b>	<b>74</b>	<b>100.0%</b>

The first research question asked what strategies students used to filter online news in an open-web setting. Results are presented in narrative form and in tables below showing the percentage of participants ( $n = 37$  unless otherwise noted) who in at least *one of two searches* used a particular search strategy or evaluation criteria<sup>2</sup>, and the *percentage* of searches ( $n = 74$  unless otherwise noted) in which participants used each strategy or criteria.

### Initial Strategy in News Search

<sup>2</sup> The researcher considered one such example as sufficient evidence that a participant used or cited a strategy or criteria during the study rather than requiring examples in both searches.

News searches far more often began with a participant searching without any specific news in mind (83.8%) than for a specific news item (16.2%). Nearly three-fourths of participants (73%) had no news item in mind for either search. Information scanners found news serendipitously by scrolling through news feeds and news aggregation websites, or browsing a news site's home page. Those who started their search on social media, search engines, and other news aggregation websites were almost exclusively scanners, with a Twitter user commenting that, "I usually scroll through, not looking at anything in particular," and a Facebook user explaining, "I'm not really looking to read news when I'm on Facebook. It's just there in front of me." Unlike information seekers, who were goal-oriented and sought a specific news story or answer to a specific query (almost always by starting at Google), information scanners left open the possibility of finding news they had not originally set out to read or watch.

Information seekers were less likely than information scanners to look for surface-level cues such as visual presentation or source reputation when filtering news and determining source and news item credibility, and more likely to draw upon firsthand experiences with a source (citing credibility indicators such as authority and trustworthiness) and specific news item cues (e.g., accuracy and attribution). Information seekers also generally displayed a greater willingness to verify information by cross-referencing facts and clicking on links to assess authoritativeness of sources cited.

### **Strategies to Filter News**

The most common strategy used by both information seekers and scanners to filter news (81.1% of participants) was going to a top-ranked or listed story. Participants who began their search on websites that aggregate news (most notably, Google and Facebook) overwhelmingly narrowed down their choices by considering only the first few news items listed in a news feed

or on a search results page. Notably, in nearly half of these searches (45.5%), participants did not cite their use of this filtering strategy during the think-aloud or in the subsequent interview when asked to explain their thought process, an indication that they lacked awareness of their reliance on algorithmically sorted news. Two who contemporaneously referenced highly ranked stories during their search explained, “We’ll go here first since it’s highlighted as the top story” and “Usually one of the best stories [on Yahoo News] is right at the top – I’m more likely to click on one of the stories there than on a link below.” When asked why he quickly clicked on the top-ranked story on Google’s results page as his news item without going any further, one participant commented: “It was the first thing I saw.”

**Table 2. Strategies used to filter news**

Strategy	Operationalization	Participants	Searches
Top-ranked/listed stories	Clicked on the first or one of the first items when presented with a list of news stories	81.1%	59.5%
News outlet reputation*	Began search on social media, search engine, or other news aggregator and considered the reputation of a news outlet	78.6%	55.6%
Headline	Headline drove decision on what news items to consider	73.0%	54.1%

Visuals (photos/graphics)	Gravitated toward (or away from) news items because they were accompanied by visuals (still photos, slideshows, videos, etc.)	73.0%	58.1%
Landing page/specific section	Visited topic-orientated landing pages such as “business” or “technology” or, in the case of Reddit, subreddits	70.3%	48.6%
Social currency in peer group	Searched for news to discuss with friends or in the classroom	40.5%	21.6%
Crowd’s recommendation	Prioritized items with the most user “upvotes” (Reddit) or considered items listed under “most read”/“most-emailed” (news outlets)	35.1%	17.6%
Friend’s recommendation	Narrowed a news search on social media by looking for items posted or endorsed by friends, or searched for news because of a friend’s recommendation	29.7%	16.2%
Trending topics	Narrowed a search to items listed under a “trending” heading (Twitter) or horizontal row directly under a masthead and above the top story (news outlets)	21.6%	12.2%
Item summarization/digest*	Considered digest/short summaries of full stories that appear below the headline and are generated by news algorithms or written by editors	14.3%	13.3%

\* For participants, n=28; for searches, n=47

Another strategy that the majority (78.6%) of participants used was considering the reputation or familiarity of the news outlet as an initial gauge of credibility when presented options by a website that aggregates news. Almost everyone who used this strategy (92.1%) cited it during their think-aloud narrative. Before selecting from a long list of news items to consider on Google's search results page, one participant said that, "There are many choices – of the options given I think Huffington Post, U.S. News, and The New York Times sound trustworthy." A Reddit user scanning links posted to the social news aggregation website commented, "I always look at the source before clicking."

Scanning headlines, photos, and graphics allowed participants to make snap judgments about a story's appeal – yet many expressed a need to further narrow down choices by going to a landing page or specific section of a website because they felt home pages, social media feeds, and search results pages were overwhelming. Focusing on a section or type of news story "cuts out the middle work a little bit" of having to sift through pages of possible news items, as a CNN user noted during the post-task interview.

Most participants (65%) relied on the crowd's recommendation, a friend's recommendation, or social currency of the topic in a peer group as a filtering mechanism in at least one of their searches. Each of these strategies was contemporaneously identified in less than half of the searches by participants who used them, another indication that they were unaware of their reliance upon social and algorithmic recommendations. Only one participant mentioned looking at the "most-viewed" section of a news website. Participants rarely gravitated toward "trending" items on news outlet homepages, and they almost never looked at those that were most-read or most-shared. Instead, participants who trusted the crowd more commonly narrowed their search by considering news items that were "upvoted" (endorsed) by others. Two Reddit

users commented that, “I’ll trust that other people have validated it before me” and “If these people say it was really good and interesting, it must be...I’m going with the crowd.”

Participants who started their search on Facebook trusted friends both to find and interpret news. One noted that, “Usually if a bunch of people share it I’ll click on it because the more people that share it the more trustworthy it is I guess.” Another said, “Coming from someone I know, him explaining [the news] is better than having the news do it.” An example of social currency was the participant who commented, “I’m not going to take the time to watch the news but if everyone is talking about stuff I want to know what everyone’s talking about.”

### Criteria to Evaluate News Outlets

The second research question asked what criteria students used to evaluate news outlet credibility. When evaluating journalistic organizations, the greatest share of participants (75.7%) considered perceived reputation or prominence. They commonly relied on others to vet sources for them, commenting that they perceived legacy, “brand-name” news outlets as being credible and having earned their trusted reputation.

**Table 3. Criteria used to evaluate news outlets**

Criteria	Operationalization	Participants	Searches
Perceived outlet reputation or prominence	Recognizable brand name or strong reputation as decided by others	75.7%	47.3%
Perceived fairness/balance	Overall tone of coverage is evenhanded	59.5%	37.8%
Breadth/exposure to variety of viewpoints	Exposes readers to a wide array of news sources and/or opinions	59.5%	40.5%
Authoritative source	Go-to place to find credible information on a given topic	48.6%	25.7%

Identifies and/or links to sources	Forthcoming about the source of information and attributes (with links to the original source) when appropriate	40.5%	20.3%
Perceived accuracy	Information published is correct	40.5%	21.6%
Timeliness	Quick to provide news updates	35.1%	18.9%
Usability/visual appearance	Easy navigation and a pleasing user interface	35.1%	21.6%
Trustworthy journalist	Recognizable or trustworthy journalist who works at a news outlet	29.7%	14.9%
Quality of writing and reporting	Overall level of writing and reporting – based on a holistic evaluation	27.0%	17.6%
Use of editors	News outlet employs editors to verify information	13.5%	6.8%
Site domain	Website’s top-level domain (.com, .edu, .gov, etc.)	10.8%	5.4%
Aligns with beliefs	Outlet perceived as sharing the reader’s worldview	5.4%	2.7%

One participant commented during his news search that, “The name behind [The New York Times] definitely carries a lot of weight. Better than, oh yeah, I went to TMZ and looked up entertainment news. I went to The New York Times and looked up some entertainment news.” Another noted that The Washington Post “has been around for a really long time” and “seems traditional.”

In several searches, participants made credibility judgments based on surface-level evaluations of keywords in a news outlet’s name. In a Google search for news about Coachella, one participant clicked on the first source listed, The Los Angeles Times. Instead of commenting



on the specific content produced by the newspaper or even its reputation as the newspaper of record in Los Angeles, the participant said that, “Anything that says Times to me is definitely credible.” Others commented in their think-aloud narrative that: “[60 Minutes] has been around for awhile. A lot of people trust it” and “I deem [CNN] to be fairly credible. It just seems more universally accepted.” Those who did not reference news outlet reputation during the think-aloud commonly cited it during the post-task interview when asked to explain how they evaluated sources of information.

References to perceived fairness and balance tended to be vague, with participants explaining during interviews (rather than during the search) that they commonly assess whether a news outlet is “biased” or “evenhanded.” However, they never defined these terms or pointed to specific examples of how they made such evaluations during their news searches. Participants who cited authoritativeness as an outlet evaluation criterion also tended to be unspecific, explaining during interviews that they generally trust outlets that have national or international audiences, or that are viewed as a local news leader. Breadth and exposure to a variety of viewpoints was a common reason given for preferring to start news searches at websites that aggregate content – particularly Google, Reddit, Twitter, and Facebook – rather than at a news outlet homepage, as illustrated by the think-aloud comment, “I don’t go to NYTimes.com and see what their headlines are. I’d rather see a lot of different stuff.” No participants cited breadth of coverage as a criterion for evaluating a specific news outlet.

Several participants, however, did not base their news outlet evaluation on perceived reputation, brand credibility, or vague notions of trustworthiness and authority. They demonstrated in their news searches – and their think-aloud narratives – an ability to apply evaluative judgments to specific cases. One participant found on Twitter what he considered a

trusted and authoritative journalist who wrote for Scientific American, which he said “is credible because the writers usually have some scientific background.” Another participant cited the importance of news outlets doing original reporting, commenting that: “I feel like a lot of times when I’m reading articles on other sites they will copy and paste what The New York Times said and use their content as their own.” A third participant checked for source identification, saying “[The Daily Beast] is less credible than The Washington Post because they seem to be getting their information from several different sources. And sometimes the sources have names that I haven’t heard of before.” Yet think-aloud comments indicating that participants had previously evaluated a news outlet’s journalistic output (e.g., quality of writing and reporting, use of editors, accuracy, or balance) or made a quick assessment during their news searches were rare.

### **Criteria to Evaluate News Item Credibility**

The third research question asked what criteria students used to evaluate news item credibility. The most common criterion (used by 81.1% of participants) was assessing the trustworthiness of the news outlet that produced the news item, as illustrated by the interview comment: “After choosing The New York Times, I assumed that whatever I saw there would be credible.” Participants most commonly selected news items from major national or international news outlets such as CNN ( $n = 8$ ), The New York Times ( $n = 5$ ), Yahoo News ( $n = 5$ ), BBC ( $n = 4$ ), Bleacher Report ( $n = 3$ ), The Washington Post ( $n = 2$ ), ESPN ( $n = 2$ ), Sports Illustrated ( $n = 2$ ), Fox News ( $n = 2$ ), and Huffington Post ( $n = 2$ ).

**Table 4: Criteria used to evaluate news items**

<b>Criteria</b>	<b>Operationalization</b>	<b>Participants</b>	<b>Searches</b>
Trustworthiness of news outlet	Decision based on the reputation of the news outlet that supplied the content rather than the merits of the news item	81.1%	55.4%

Content of headline*	Based news item evaluation on the headline (rather than using it merely as a sorting mechanism)	50.0%	34.8%
Authoritativeness of sources cited	Whether the sources cited are reputable and knowledgeable	48.6%	32.4%
Authoritativeness of content producer	Whether reporter or other content producer is reputable and knowledgeable	48.6%	27.0%
Factuality/opinions*	Truthfulness or lack thereof	38.9%	25.8%
Depth of reporting*	Length of a news item, number of interviews conducted, and amount of space spent explaining a concept	36.1%	21.2%
Attribution	Whether sources of information are cited	29.7%	16.2%
Usability/visual appearance	Visual appeal or accessibility/usability	27.0%	27.0%
Checked multiple sources for comparison	Cross-referenced information found in one news item to others across the web	24.3%	12.2%
Links**	Clicked on the links and evaluated the information supplied	16.2%	15.8%
Name of content producer	Reporter or content producer's name is included on a news item	16.2%	8.1%
Prominence or placement/rank	Placement of item near the top of a webpage or article ranking	16.2%	9.5%
Evenhandedness*	Bias, fairness or similar terms	13.9%	9.1%

\*For participants, n=36; for searches, n=66

\*\*For participants, n=34; for searches, n=57

Some participants were at a loss to determine how to evaluate a news item and instead relied on the news outlet's reputation as a proxy, as explained in this interview response: "I try to stick to CNN because CNN has never screwed me over before. There's not really a good way to figure

out if [this article] is credible or not. I just look at the source and I trust CNN for the most part.”

Many seemed aware of limitations in using the outlet’s reputation as the sole proxy for an item’s credibility, but found the simplicity of the approach appealing. One participant stated during his search, “Generally I just trust MSN. That’s probably a bad decision, just trusting things. But because it’s such a simple, straight-forward story I thought I’d trust what MSN says.”

Participants more often referenced news outlet reputation as a reason to select a news item when asked in interviews to explain their decision than contemporaneously during the search.

Just as participants used headlines and visuals to make snap judgments about a story’s appeal while filtering news, some also used these cues to make quick assessments about a news item’s credibility without examining the content of the story itself. In nearly 6 of 10 searches (59.5%) participants just considered the headline, subhead, or digest compiled by a news aggregator or editor, or clicked through to the entire article but only skimmed the first few sentences. When asked how she evaluated the credibility of an article she selected, one participant responded, “There’s an author. The picture looks pretty intense. There are names and dates. I don’t really see anything about it that would make it seem not credible.”

Mostly in cases in which participants sought specific information about a news story they had been following, they performed a more critical analysis of news items by evaluating the authoritativeness of journalists and the sources they included in a story. Two participants said during interviews that they “wanted to see people [quoted] who were directly linked to the event,” and “wanted to hear [information] from an official and not just a bystander.” Yet most did not check for the existence of attribution, instead making more surface-level evaluations such as: “Within the first two paragraphs they talk about specific people. They have quotations. They cite a person and her age.” Few (16.2%) checked for the existence of links in a news item or

clicked on them to find primary source material, although one participant did so in an effort to better understand the context of a blog post: “I read this and it said ‘Tells Sports Illustrated.’ I knew that they would have the actual interview; this [blog post] would just have snippets.”

Another participant made the assessment that, “The more links [articles] have the more research they have done and in my opinion they are a more legitimate source.”

Few (24.3%) checked multiple sources for comparison. When considering a *BBC* article on the earth’s core, one participant clicked on a link and was frustrated by receipt of an error message. “Hmm. Broken link – that’s great. I have no way of checking the plausibility of that article.” She assessed the authoritativeness of sources cited, saying when she came across an expert quoted in the article during the think-aloud, “Cool, let me look at this guy.” She then did a Google search for the expert quoted and was satisfied when she found the original study on which the *BBC* article was based. “I’m trying to cross-reference what the article says with what the abstract said. It looks pretty similar. I don’t think they made any wild claims.”

This type of fact checking and cross-referencing was unusual, however. Participants who cited evenhandedness and truthfulness as news item evaluation criteria almost exclusively cited these in interviews rather than during a news search, rarely gave specific examples of how they reached these conclusions, and did not demonstrate that they had made an effort to examine the veracity of the information. Few participants (36.1%) referenced depth of reporting as a criterion, and those who did cited the length of a news item and the use of statistics rather than more nuanced evaluations of the completeness of reporting or the source of the data used in a story.

### **Discussion**

This study examined how students access, filter, and evaluate news in an open-web setting in an effort to understand the search strategies and evaluation criteria that warrant

targeting or greater emphasis in news literacy curricula and assessments. Think-aloud protocols and subsequent in-depth interviews measured participants' awareness of their choices that shape what news they consume. A goal of news literacy education should be to seek an outcome in which students (a) have the most conscious awareness of the strategies and criteria they use in the process of accessing and evaluating online news and (b) acquire an understanding of how their choices affect the credibility and diversity of what they consume.

Results show that participants overwhelmingly conducted open-ended searches with awareness of a goal (to find credible, topical news) but with no specific news or question in mind – defined in this study as information scanning. Routine surveillance and incidental consumption, information-gathering processes described by Antunovic, Parsons, and Cooke (2018), were far more commonplace than directed consumption. Even after participants who found news serendipitously began evaluating a news item, as they were instructed to do, few sought out additional information by cross-referencing or clicking on hyperlinks. Finding news serendipitously during news searches rather than targeting a specific topic may indicate that participants were not following many particular news stories as part of their typical routine – even in high areas of interest. Those who sought out news about a particular topic of interest were likelier than news scanners to demonstrate effortful processing of information rather than outsourcing evaluations to others or relying upon heuristics.

Consistent with recent research on news habits of young adults (Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2018), participants often began a news search on a website that selects and filters the news sources and items displayed. Students' preference to access news through news aggregation platforms makes them reliant on algorithms that employ non-transparent factors to select and rank news, often through content personalization. Educators

should consider ways to teach students about how personalization potentially leads to consuming a narrow selection of news and topics with less diverse perspectives.

Regardless of the initial search strategy used, consumers are likely to face the task of narrowing down news items to consider from the heavy stream now available online to manage information overload. The most-often-used strategy to narrow down news choices, going to a top-ranked or listed news item, is not inherently problematic. A news item's ranking or placement on a page has long been considered an indicator of newsworthiness. But this is largely a function of the traditional role of editorial judgment in assessing an item's news value. Reliance on top-ranked news items by habit or the assumption that prominent placement always reflects newsworthiness or credibility suggests a lack of understanding of how online information is selected, distributed for publication, and ranked. The increasing use of personalization technology and the ability of publishers to spread false or misleading information makes a news item's high ranking or prominent placement an uncertain indicator of credibility or newsworthiness. This often reflects instead an item's popularity with an undefined group of people; likely appeal based upon users' search history, geolocation, or demographic profile; its status as trending, most shared, or most liked/upvoted; its being a promoted (paid) post or content; or its use of search engine optimization keywords to attract web traffic.

Participants' think-aloud comments revealed significant trust in sites that rely on algorithms to prioritize the most newsworthy items and a reliance on the "machine heuristic" when evaluating credibility (Sundar, Knobloch-Westerwick, & Hastall, 2007). College students have been found to be very trusting of Google's ability to rank results by their true relevance to the query (Hargittai et al., 2010), and to overwhelmingly select top-ranked entries out of convenience. In this study, nearly one-third of participants never went beyond a top-ranked or

listed story when selecting news. In nearly half of all searches in which participants used an item's top-ranking or listing as a filtering mechanism, they failed to mention this during the think-aloud protocol or interviews.

Social media platforms make it substantially easier for users to tap into their personal networks to access, filter, and evaluate news. Nearly two-thirds of participants relied on the crowd's recommendation, a friend's recommendation, or social currency of the topic in a peer group when filtering news. This finding is consistent with previous research showing that students often perceive popularity as a form of endorsement (Hilligoss & Rieh, 2008). Getting news from well-informed friends or trusted members of the crowd can be a smart strategy. However, participant comments and actions showed a broad willingness to let others shape much of the news they consume, and a tendency to rely upon authority or endorsement heuristics and uncritically trust the crowd's ability to promote the most relevant or reliable content. Jessen and Jorgensen's (2012) "aggregated trustworthiness" theory best explains participants' tendency to value social feedback and collective judgment when filtering news and evaluating its credibility.

These results suggest that interpersonal networks are central to the process by which students access and filter digital news. The two-step flow model of communication helps explain the common use of several search strategies and filtering criteria. Several students referenced trusting opinion leaders (news junkies and social media power users) to identify news they otherwise would have missed or explain news they would not have bothered to understand on their own. However, modifications to the two-step flow model (suggested to a degree in previous research) are necessary to accurately reflect students' search and filtering strategies. The ease of sharing information on social media and news sites, and providing endorsements through "likes," "shares" and "upvotes," has lowered the barriers to becoming an influencer. This study also



found that members of the crowd, even when personally unknown, can influence the ways in which students filter and evaluate the credibility of news. Students may at once rely on human influencers to post and comment on news, and push notifications or personalization technology to filter the news they find. An updated model of communication flow should include the role of opinion leaders referenced in the two-step flow (Katz & Lazarsfeld, 1955), personalized messages and echo chambers central to Bennett & Manheim's (2006) one-step flow, and individual agency and outside influences (push notifications and algorithms) in Thorson & Wells' (2012) curation of flows.

Many participants who began their search on a website that aggregates news considered the news outlet when deciding what to read. However, participants largely did not contemporaneously explain *how* they evaluated news outlets, suggesting less overall conscious awareness of this than for strategies or criteria for initial filtering of news or to evaluating news items. The most commonly-used criterion for assessing outlet credibility, perceived prominence or reputation, is an unreliable way to filter news or evaluate news outlets, reflecting qualities or characteristics as judged by others. Dependence on reputation and source heuristics reflects an unwillingness or inability to make independent assessments about a news outlet – a central objective of news literacy education.

An individual's firsthand experience with a news outlet over time can compensate for limitations in a particular group's judgment. However, participants were often unable to give specific reasons for believing that an outlet warranted a presumption of credibility, and instead relied upon surface-level characteristics such as the presence of the word "Times" in the outlet's name. Source evaluations based on surface credibility ( cursory inspection of superficial characteristics) rather than experienced credibility (firsthand experiences) are problematic in the

age of fake news and misinformation, when untrustworthy outlets have names meant to resemble credible sources of news.

A significant portion of lab participants did not evaluate a news outlet based on perceived fairness/balance/lack of bias, authoritative sources on a topic, or accuracy. Because participants were not asked to explain how they judge inaccuracy and bias, no findings can be presented about the merits of the basis for the evaluations made. However, the limited extent to which these criteria were used alone suggests that students should be taught the importance of doing so with respect to news published online.

Despite explicit directions to evaluate credibility, most participants did not closely read or watch the news items they selected, instead making quick judgments by scanning the headline or relying on reputed news outlet trustworthiness as a proxy. Rather than examining a range of content cues, they often relied on peripheral cues (outlet reputation) and object cues (aesthetics or presentation). The explosion of news and news sources available online makes it increasingly important that items accessed are evaluated based on more than surface-level characteristics. Relatively few participants demonstrated critical thinking by evaluating the authoritativeness of sources cited or of the content producer, the factuality and depth of reporting, or evenhandedness/balance of the news item. News literacy curricula should cover the above criteria for evaluating item credibility.

This study indicates that participants were often in a state of automaticity when exposed to the constant flow of digital content. A significant share of participants failed to contemporaneously acknowledge the strategies and criteria they used to filter news, and to evaluate news sources and news items. The explosion of news available online likely contributes to the extent to which news search behavior appears to be habitual or automatic, rather than a

conscious strategy. In short, when asked to explain the thought processes underlying their news searches, many students lacked a conscious awareness or understanding of the strategies and evaluation criteria that potentially affect the credibility and diversity of news consumed.

Reliance on automatic processing to filter information deemphasizes critical thinking and often results in others making decisions about the news accessed. These results suggest that in addition to giving students a better understanding of how the way they access news online affects the credibility and diversity of what they consume, news literacy educators should help students become more conscious of the strategies and evaluation criteria they use.

### **Limitations & Directions for Future Research**

A true probability sample would allow for a stronger claim about the generalizability of findings to all college students. During lab sessions, the presence of the researcher may have led to normative responses from participants or actions they would not typically take while searching for news. While the researcher remained silent during the news searches to avoid priming participants or interrupting their typical routine, the instruction to talk aloud during the search may have caused them to modify their behavior. For some participants, the instruction to select a credible news item also may have changed their typical routine given research showing that students often access news that is convenient and rely on sources they do not consider credible. Additionally, the instruction to seek out news may not reflect their normal way of coming across news while doing other things, and the lack of guidance on what to search for may explain the high share of participants who were information scanners rather than seekers. Finally, some participants may have used a search strategy or evaluation criterion without verbalizing it during the session, or without demonstrating it clearly enough for screen-capture software to track.

This study focused exclusively on how participants search for and select news on a computer. A logical follow-up to this study would investigate college students' mobile news consumption. This study attempted to control for motivation and familiarity in the lab setting by instructing participants to seek topics of stated interest, and to start their search where they typically begin. Future studies could make interest and familiarity independent variables by instructing subjects to conduct searches on topics in which they are both interested and disinterested, and on sites in which they are both familiar and unfamiliar. Participants in this study were instructed to find news items they deemed credible, but those items selected were not reviewed and rated for attributes of credibility. Future studies could add this step to the method employed here to identify correlations between the other indicators and the extent to which news selected had potential issues regarding credibility.

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## **Appendix A: Interview Questions for Lab Participants**

### General Questions:

- How is [name of website] part of your daily online route?
- Why do you typically start with [name of website] when searching for news on a topic of interest?
- How would you rate the credibility of the information included on this site? How do you evaluate this?

### Questions About News Search:

- What was the first thing you looked for on this page and why? (Repeated for each screen capture)
- How did you decide what to scan or read on this page and what to ignore? (Repeated for each screen capture)
- What specifically about the item led you to consider it?

### Questions About News Item Selected:

- Why did you select this news item?
- How did you make credibility evaluations?

**Technology, Literacy, and Self-Regulated Learning: The Impact eReaders have on the Reading Engagement Behaviors of a Group of Intermediate Grade Boys**

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## Abstract

For school-aged boys, it could be argued that reading orientation, i.e., a willingness and ability to focus on reading tasks, is generally lower than for their female peers. Boys' low reading orientation contributes to a gap in reading achievement and leads to many boys being labeled as reluctant readers. The purpose of this article is to provide results from a research study undertaken to understand the impact Kindle® eReaders had on the reading experiences and motivation of eight intermediate grade boys. Focus groups and participant observations were employed to examine the participants' reading engagement behaviors. Analysis of the data revealed that the boys were purposeful in the selection of titles they found relevant thus allowing for self-regulated learning. Based on study findings, recommendations are made to assist administrators and teachers in creating learning environments that bolster reading engagement among students, including those that have been labeled as reluctant readers.

Keywords: eReaders; boys and literacy; reluctant readers; social interactions; self-regulated learning

## Introduction

"For school-aged boys, it could be argued that reading orientation, the willingness and ability to focus on reading tasks, is lower than for their female peers" (Martinez, 2017, pp. 14-15). Due in part to lower reading orientations, there exists a reading achievement gap between boys and girls, which in turn leads to boys being categorized as reluctant readers. In standardized reading testing, boys score lower than girls, many boys self-report that they are less capable than girls when it comes to reading acumen (Boltz, 2007; NAEP, 2015; National Literacy Trust, 2012; Retelsdorf, Schwartz, & Asbrock, 2015). In 2012, the National Literacy Trust found a significant reduction in the number of boys who self-reported spending time in leisure-reading activities and reported that only one in four boys engaged in reading on a daily basis. Research studies have also shown that boys tend to be less motivated to read overall (Coddington & Guthrie, 2009; Wigfield, 2000). These research studies and reports support the notion that boys are less likely to read on a consistent basis than girls.

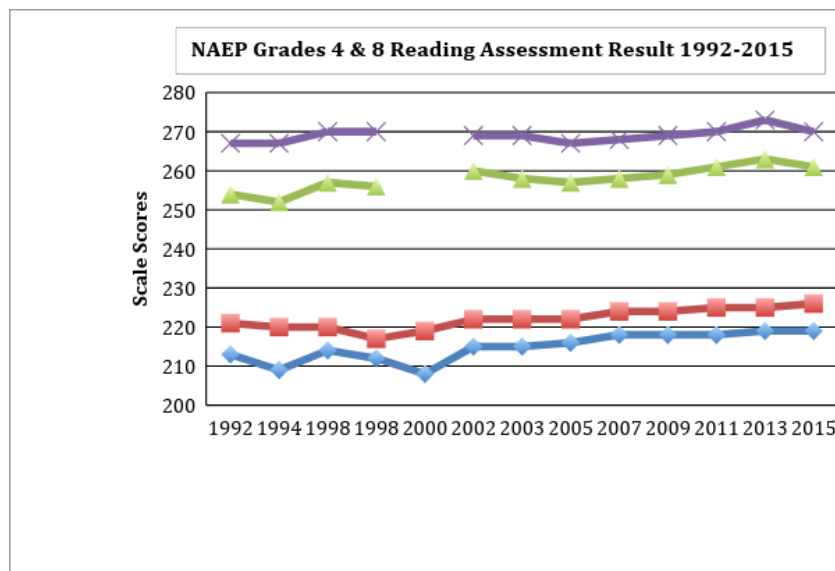


Figure 1. NAEP Grades 4 & 8 Reading Assessment Result 1992-2015

This reading disparity is not a new phenomenon. As shown in Figure 1, longitudinal assessment data shows that between 1992 and 2015 the gap in reading achievement between girls and boys remained constant (Bank, 2015). Although the results do not imply that all boys are unmotivated or low achieving readers, they point to an alarming historical trend that situates boys in a deficit position when it comes to reading when compared to their female peers. The trend speaks to a collective history of underperformance on reading assessments for boys. "This data further corroborates the position that boys' low reading orientation is contributing to a gap in reading achievement and their portrayal as reluctant readers" (Martinez, 2017, p. 18).

To address the growing concerns with the reading achievement gap, fourteen states enacted mandatory retention laws for students who fail to meet predetermined reading standards by the end of third grade (Tulenko, 2013). Even though reading achievement goals remain a significant part of federal education laws like No Child Left Behind (NCLB), Race to the Top, and the Every Student Succeeds Act, as well as in state laws which also requiring mandatory retention, there has been little to no change in the reading achievement levels of boys. So, while it is essential to consider the weight of federal laws, as well as the expectations from state legislatures, it is crucial that school administrators understand the importance of employing instructional practices that influence motivation for boys as self-regulated readers.

The purpose of this article is to provide information from a dissertation research study that looked at the impact Kindle® eReaders had on the reading practices of eight (8) intermediate grade boys, who had been identified by their teachers as reluctant readers. Based on analysis of the collected data, one key finding was that the boys exhibited more self-regulated learning behaviors when given access to Kindle® eReaders. EReading, reading on an eReader like the Kindle®, may be one way to engage reluctant readers. Better understanding behaviors, actions,



and reading choices made by boys, who were labeled as reluctant readers, may help administrators and teachers develop plans to utilize eReading as part of their reading curriculum.

### **Theoretical Framework**

For the research study, a sociocultural framework of learning and development was used to better understand the participants' behaviors, choices, and actions as they accessed digital collections with Kindle® eReaders. A look at the historical context of the sociocultural approaches to learning and development can be found in the writings of Lev Vygotsky. Vygotsky's work originated in the school of thought born from Russian Psychology of the 1920's and 1930's (Kaptelinin & Nardi, 2012; Wertsch, 1998). Vygotsky (1978) rejected the notion that development occurred in isolation and instead advanced the notion that learning is a function of cultural development. Vygotsky (1978) believed that learning occurred within a *zone of proximal development* that allowed instructors to "delineate the child's immediate future and his dynamic developmental state, allowing not only for what already has been achieved developmentally but also for what is in the course of maturing" (Vygotsky, 1978, p. 33). Teachers that worked with children in the zone of proximal development afforded students the opportunity to expand their problem-solving abilities while completing complex learning activities that they would not be able to accomplish independently.

In line with Vygotsky's (1978) assertion of the zone of proximal development, Bruner (2009) posits that a person's experience of reality is represented by a linking of symbols to the contexts in which the experiences occurred. For Bruner, this form of symbolic interactionism is a shared reality between community members and may be employed in various contexts to construct varying interpretations of reality. Then, often through language, the symbols are "elaborated, and passed on to succeeding generations who, by this transmission, continue to

maintain the culture's identity and way of life" (Bruner, 2009, p. 160-61). In both cases, the "learning and developmental processes conceived by Vygotsky (1978) and Bruner (2009) position the development of knowledge and understanding in the social interactions between individuals, within specific contexts, where people employ culturally relevant symbols or tools jointly with their interactions to make meaning of situations and events they experience" (Martinez, 2017, p. 45). Thus, the research in this study used a sociocultural lens for analysis that pulled from Vygotsky's (1978) zone of proximal development and Bruner's (2009) symbolic interactionism.

### **Background literature**

Many children begin developing reading skills as they learn to make meaning from both printed and digital text. These screen-based text images are the first exposure some children have to display, meaning-making processes digitally. "As children grow and mature their reading becomes an active, integrated mental process that is expected to result in making meaning from printed or digitally displayed text or characters in words, phrases, sentences, and paragraphs" (Martinez, 2017, p. 49). Readers deliberately engage with the text during the reading process by bringing to bear their unique experiences, background, and ways of knowing to the creation of meaning (Goodman & Niles, 1970; Rosenblatt, 1988).

Reading requires motivation (Gambrell, 1996) and engagement between the reader and the text; It is not a passive activity. According to Rosenblatt (1988, 1994), readers bring unique background experiences to the reading event thus creating a unique context in which meaning is made during the transaction between the reader and text. This transactional exchange allows the reader to experience an individualized meaning-making event. Thus, there exists no "generic reader, that each reading involves a particular person at a particular time and place, underlines

the importance of such factors in the transaction as gender, ethnic and socioeconomic background, and cultural environment” (Rosenblatt, 1994, p. viii). She makes the case that readers need not be lumped together in a mass categorization of a passive audience but instead be seen as active participants in the reading process. By shifting the perception that readers are active, rather than passive participants, in the meaning-making process, it is easy to see how the lived experiences, and the unique perspectives of each reader influence the meaning they take from the text. It is also then possible to better understand the relationship between reader motivation and achievement.

### **Reading Motivation**

Teachers recognize the problem of low reading orientation and its links to the fissures in reading achievement between girls and boys. Gambrell (1996) found that teachers are eager to understand the relationships that exist between motivation and achievement. They recognize that motivation has a widespread influence on literacy learning. There is a strong connection between reading motivation and reading achievement. In one study "third and fifth grade students' self-report amount of time spent reading in school and out of school was associated with competency tests of students' reading comprehension, even when controlling for background knowledge, previous grades, intrinsic motivation, and self-efficacy” (Guthrie & Wigfield as cited in Guthrie, Wigfield & You, 2012, p. 609). Wigfield (2000) explains that as students spend more significant amounts of time reading, they become better equipped for reading achievement and reading skill development which in turn supports their reading self-efficacy.

In her study of a reading motivation program designed for use at the elementary level, Gambrell (1996) noted that, while in general children valued reading, a significant percentage of

her participants in third through fifth grades did not consider reading a high priority activity. These findings were especially true in schools where there had previously been insufficient literacy achievement and high poverty. She explained that analysis of the results of the Value of Reading subscale from the Motivation to Read Profile uncovered that 17% of the students she surveyed preferred cleaning their room to reading a book and 14% predicted that they would spend little to no time reading in their adult lives. One-tenth of the participants also felt that people who spent time reading were boring.

Clark's (2011) more recent study aligns with the findings of Gambrell (1996). She suggested that as children's lives became busier, filled with more leisure time activities and choices fewer children were choosing reading as a leisure time activity. "More than a fifth of children and young people (22%) rarely or never read in their own time. More than half (54%) prefer watching TV to reading [and] nearly a fifth (17%) would be embarrassed if their friends saw them reading" (Clark, 2011, p. 7). Clark's findings align with the conclusions drawn by National Literacy Trust (2012), and Guthrie, Wigfield, and You (2012) that students who have a low reading motivation, choose not to read and reinforce the reading achievement gap that has been present for a generation or more.

Building from the perspective that meaning-making is an active process that requires an engaged learner to be in transaction with the text, the reading experience and meaning-making activities require purposeful action by the reader. As is well documented in the literature, school-aged boys often maintain lower reading orientation and underperform compared to girls on standardized reading assessments. They self-report being less capable readers than their female peers, having less interest in reading as a leisure activity, and being less motivated to read

overall (Boltz, 2007; Chambers, 1969; NAEP, 2015; National Literacy Trust, 2012). These beliefs come together and lead to their classification as reluctant readers.

### **Boys as Reluctant Readers**

When it comes to reading assessments, girls are outperforming boys. Girls choose to read at higher rates than boys, and in general, school-aged girls are more motivated to read than boys (Clark, 2011). As a result of their lower reading orientation and inferior performance on standardized reading assessments, educators have developed a pervasive belief that boys are less motivated to read compared to their female counterparts (Coddington & Guthrie, 2009; Wheldall, & Limbrick, 2010). This is particularly evident in the way boys are labeled as *reluctant readers*. Chambers (1969) defined reluctant readers as “those who have the ability to read without any mechanical problems but have little or no inclination to read except what is required by way of work or normal everyday life” (p. 4).

School is a primary access point for acquiring reading material, developing reading skills, and for building reading orientation. Allington (1983) observed literacy instruction provided to children of low socioeconomic status is often insufficient for achieving those goals. He observed and commented on instructional environments that impeded learning to read and further hindered the growth of reading motivation. The poor instruction observed by Allington was a contributing factor in creating a Matthew effect for reading “whereby good readers get better because they take advantage of opportunities to read...[and] poor readers fall farther behind because they avoid such opportunities” (Anderson-Inman & Horney, 1998, p. 17). Teachers’ gender stereotypes (Retelsdorf, Schwartz, & Asbrock, 2015), ineffective instruction, low reading orientation, text interactions that fail to produce significant meaning, and the absence of high-quality print and digital reading materials all contribute to the unrelenting achievement gap that

continues to depress boys' motivation for reading and helped lead to them being identified as reluctant readers.

### **eBooks and eReaders**

Over the past decade, eBooks and eReaders have gained traction in the publishing industry (Chandler, 2015; Rozema, 2015) and are considered one of the top 10 game changers for school libraries in the past 25 years (Johnson, 2013). All age groups are increasing access to digital reading experiences (Pew, 2012) and "electronic text is nearly universal in schools, homes, and students' backpacks" (Guthrie, Wigfield, & You, 2012, p. 631). In fact, many K-12 schools are being pressured to leave behind traditional textbooks and pursue mobile and digital text options via open educational resources, web resources, and eBooks (Lenkei, 2016; Lewin, 2009; Molnar, 2016, Stern, 2013; Zubrzycki, 2016).

This shift brings different consequences. Stern (2013) wrote that one of the first high schools, Stepinac in White Plains, New York adopted a "digital library" (para. 3) and was all for "letting go of expensive, heavy, environmentally unfriendly and instantly outdated books" (para. 5). On the other hand, a study done by Scholastic (2015) indicated an increase from 60 to 65 percent of school-age children who would always prefer to read print over eBooks. Further, Kuforiji & Williams (2017) identified that existing classroom research on eReaders often focuses on the obstacles teachers face using eReaders (Gros, 2013; Hutchinson & Reinking, 2011) and is primarily outside of the school setting (Mitchell, 2013; Scale, 2012). It is critical to examine the impact of eBooks and eReaders in schools and classrooms to find the right balance of integration. According to Larson (2010), "[t]he rapidly changing nature of e-books and digital reading devices demands a progressive research agenda that examines the use of new technologies in authentic school settings" (p. 22).

Specifically, one area that warrants examination is "whether motivation, behavioral engagement, and competence in the domain of electronic text interaction are subject to the same principles as traditional interaction with printed text" (Guthrie, Wigfield, & You, 2012, p. 631). Existing research looks at understanding that not every student enters school as a highly motivated reader, or with strong reading orientation; and has identified classroom characteristics and teacher behaviors that have been shown to support reading motivation including relevance, choice, student-centeredness, and teachers' emotional support (Guthrie, 2011). Guthrie, Wigfield, & You (2012) further examined "the quality of teacher-student relationships" (p. 625) and found that students' motivation for school and reading increased "when teachers emphasize collaboration and positive interpersonal relationships (between themselves and students and among students in the classroom)" (p. 625). Research is needed to extend the body of knowledge about the impact of the use of eBooks and eReaders on student motivation. Examining the behaviors, choices, and actions that students and for this article, specifically, boys make when they use eReaders to access the digital collections of a city-county library district and Amazon's eBook store creates deeper understandings of their motivation and reading experiences.

## **Methods**

The purpose of this research study was to learn about the impact eReader usage had on the reading experiences, behaviors, and choices of intermediate grade boys, who had been characterized as reluctant readers. A case study was conducted to understand the behaviors, choices, and actions of intermediate grade boys in Colorado when they used eReaders to access digital libraries (Martinez, 2017). The chosen methods for collecting qualitative data included participant observations and focus group interviews. An instrumental case study (Stake, 1998) was selected to create historically bound, thick descriptions of the behaviors, choices, and

actions, of the participants as they used eReaders. The researcher was immersed in the “daily activities, rituals, interactions, and events of a group of people as a means of learning the explicit and tacit aspects of their life routines and their culture” (DeWalt & DeWalt, 2011, p. 1) through the use of participant observations. Finally, focus group interviews (Hesse-Biber and Leavy, 2011; Krueger and Casey, 2009; Stewart, Shamdasani, & Rook, 2007) provided a broad understanding of the phenomena.

The participants for this study were a group of eight intermediate grade boys from an elementary school in Southern Colorado. The school is located in a geographically diverse district that is classified as rural by the Colorado Department of Education. The school population is twenty-six percent minority. Thirty-five percent of the student population qualifies for the USDA Free and Reduced Lunch Program. The sample population resembles the school socioeconomic and ethnic demographics. The purposeful sample criteria included: a) student was an intermediate grade boy at the research site, b) student was identified as a reluctant reader by his classroom teacher, and c) student did not have a reading support plan or an individualized education plan (IEP) that included reading support .

The lead researcher (first author) was a participant observer (Gold, 1958) because he was the participants’ technology teacher and was in the classrooms with the students on a weekly basis for observation and interaction. Data were collected over an eight-week period at the research site. For this study, participant observations, using an observation protocol, occurred weekly for each participant during the eight-week data collection period by the lead researcher. Focus groups were systematically conducted every other week by the lead researcher utilizing Krueger and Casey’s (2009) focus group model.

## **Results**



An analysis of the case study data, revealed a significant finding that participants' self-regulated their learning, alternating between eBooks and print books in the selection of reading material. They selected specific genres, titles, and maintained specific purposes for their self-selected reading tasks. The data record also indicates that the participants made utilitarian uses of the eReading device. The behavior, actions, and choices these participants made run counter to the operationalized definition of reluctant readers (Chambers, 1969) as used in this research study.

### ***Self-Regulation of Learning***

During the research study, the question under investigation was, "*What happens when a group of intermediate grade boys, who have been identified by their teachers as reluctant readers, are given Kindle® eReaders to use?*" Examination of the data set revealed that the participants used the Kindle® eReaders to self-regulate their learning in a variety of ways. This included selecting an assortment of eBooks from fiction and nonfiction genres. It also included them finding utilitarian uses for the eReading device.

Zimmerman (1990), credited with foundational theoretical work about self-regulated learning, explained that self-regulated learners "approach educational tasks with confidence, diligence, and resourcefulness" (p. 4). Self-regulated learners, according to Zimmerman's conception, recognize their self-efficacy and generate personal learning goals that are modeled on their perceived competencies. Students who engage in self-regulated learning internalize their personal learning goals and initiate actions to acquire the knowledge or skills they seek. Then they strategically apply learning activities to grasp their new skills or knowledge. Self-regulated learners are not impeded by common obstacles to learning or skill development and believe that knowledge acquisition is a "systematic and controllable process" (Zimmerman,

2010, p. 4). He suggested that students who demonstrate self-regulating behaviors engage in interdependent motivational processes, respond to self-oriented feedback, and apply self-regulated learning strategies.

The characteristics of self-regulation as described by Zimmerman were evident in the reports of their eReading experiences and used for the eReader provided by the participants. They described selecting and reading eBooks. Then in their focus groups discussed the authors, the characters, and the plots, from the stories. After they read expository texts on the eReader, they explained their skill development and the learning that occurred from the eBook. In describing their other uses for the eReaders, the participants detailed the learning support provided by the eReading device.

The participants' descriptions and explanations of their self-regulated learning behaviors were used to answer the research question. In the data record, it was evident that the participants self-regulated their learning by selecting reading material in eBook or print book format and by devising utilitarian uses for the eReaders. They demonstrated self-regulated learning through the selection of specific genres and titles of the books and eBooks they read during the data collection. They extended their self-regulating behaviors by maintaining specific purposes for selecting and reading their chosen titles and by using the eReader in ways that supported both teacher assigned and self-selected learning tasks. These participants were engaged in autonomous decision-making, and thereby were active agents in self-regulation of their reading and learning tasks. These findings answered this research question and are examined below.

### **Book format.**

The participants selected books in both eBook and print book format during the data collection period. Alternating between book formats was one method for exhibiting self-regulation of their learning. When the participants had reading tasks assigned by their teachers they selected mostly printed material. Student Eight explained, “I have been reading an actual book, *The Hardy Boys* so that I can take AR [Accelerated Reader] tests. It is from the school library” (Student Eight, Focus Group, October 18, 2016). For self-selected reading tasks, the boys selected both eBooks and print books. Student One stated, “I hardly read this at night, but sometimes when I get home I read this [waves a paperback] (Student One, Focus Group, October 18, 2016). Choosing one book format over another for their reading material was a characteristic of the methods the participants used to self-regulate their learning as the same title was available in both print and digital format.

In a few cases, the participants selected print books based on a physical need that was unmet by their eBooks. Student Eight chose to read his *Treasure Hunters* series, by James Patterson, in print instead of using his Kindle®. About using the eReader, he stated “I like the paperback book because I like holding the book in my whole hand. With the Kindle® you barely even swipe with your finger” (Student Eight, Focus Group, October 18, 2016). Student Four also felt that it was “easier” to tell what a print book was about because he could read the dust jacket. These boys’ statements suggest what Sellen and Harper (2002) discovered. The tangibility of paper allows for a distinctive tactile experience that one does not receive when reading from a screen.

The participants in this case study were actively engaged in eReading tasks. However, their use of the eReader was offset by a regular selection of printed reading material. For independent reading, their behavior showed that the Kindles® were a useful device, but not a

replacement for all reading tasks. This finding confirms Ciampa's (2012) finding that eReading may be a beneficial supplement to a print-based literacy program. De Jong and Bus (2002) had concurrent findings from an earlier study. They explained, "exploration of electronic books is not a replacement for regular book-reading sessions but a valuable supplement. Suitable electronic books offer overlapping and complementary experiences with the written form of words and the story content" (de Jong & Bus, 2002, p. 154). Both Ciampa (2012) and DeJong and Bus (2002) support the notion that eBooks provide students with measurable benefits but are not a one-for-one replacement for print book reading experiences. The findings advanced by both Ciampa (2012) and de Jong and Bus (2002) are reinforced by the data collected about these boys' actions and behaviors. The participants demonstrated that eReading could be a beneficial addition for self-regulation to a school-based reading program where students have access to a variety of material in both print and digital formats. The eReader provides the students the capacity to decide to access an eBook or print books as different needs arise.

## Genre.

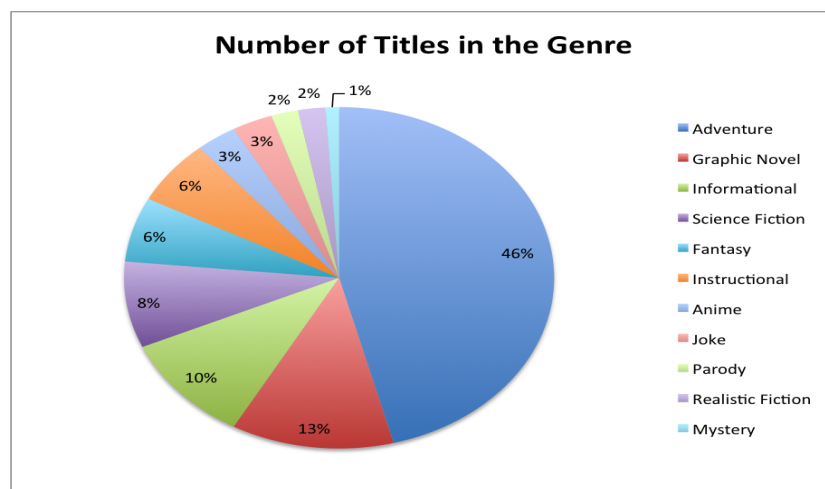


Figure 2. Percent of books downloaded by genre

The boys in this study engaged in self-regulation of their learning by selecting specific genres of books and eBooks for their reading tasks. As shown in Figure 2, for leisure reading, the boys demonstrated a preference for fiction titles downloading more fiction eBooks than any other genre. The boys also engaged in self-regulation of their learning when they selected specific descriptive titles. Informational eBooks, video game strategy eBooks, and instructional eBooks made up sixteen percent of the eBooks they downloaded. The variation in genre selection was evidence of self-regulation of the participants' learning behaviors.

Student Seven displayed self-regulation through his selection of a specific genre and title stating, "I like my *Star Wars* book because I've seen all the movies and I've read most of the books. I think I have two more to read after this one. I like the *Star Wars* books. Some of them are not the same author, but they are kind of related to the movie" (Student Seven, Focus Group, October 4, 2016). His background knowledge and experience with the movies and that eBook series supported his motivation for reading and afforded him the ability to self-regulate his reading experience. Student One shared similar self-regulatory behaviors in his selection of an eBook from the instructional genre. He stated, "The reason I like the *Minecraft Secrets Handbook* book is because when I play *Minecraft* at home on my PS3 if, I read that [and] I don't know what to do, I don't have to spend time searching *YouTube* on my tablet to see what to do" (Student One, Focus Group October 4, 2016). His choice to select an eBook from the instructional genre demonstrated both his belief in the importance of the learning task, developing a game skill or strategy, and his interest in the reading task. Reading the *Minecraft Secrets Handbook* saved him from having to "spend time searching *YouTube*" and allowed him to continue to engage in gameplay with the new knowledge he gained from his selection of an eBook from the instructional genre.

The availability of reading material from multiple genres bolstered the participants' self-regulation of their learning. Through their self-selection of eBooks from diverse genres, the participants addressed their specific reading needs. Zimmerman (1990) explained that "self-regulated students proactively seek out information when needed and take the necessary step to master it" (p. 4). The participants demonstrated that books and eBooks in different genres provided different reading experiences. In line with Zimmerman's assertion, they read fiction titles for enjoyment, and expository texts from the informational and instructional genres to further their skills and address immediate learning needs.

### **Self-regulated Learning**

The participants engaged in self-regulation of learning through their purposeful selection of reading material that met their unique goals for reading. The availability of reading material accessible on the eReader made addressing their purposes for reading a probability. As they established the purposes for their specific reading tasks, they developed high interest, an element of motivation that has been well documented in the literature on motivation (Cambria & Guthrie, 2010, Pintrich & de Groot, 1990; Zimmerman, 1990). Self-regulation of their learning occurred as a result of their engaged reading behaviors, the purposes they had for reading, and their motivation to address their purposes for reading.

The participants made purposeful selections in their reading material explaining their selections by stating, "I researched *Minecraft* stuff"; "I got it, so I could learn Spanish"; and "[I got it] for my AR [Accelerated Reader] test tomorrow." They exhibited their tacit knowledge that selecting specific titles would lead them to achieve their learning goals, most commonly answering questions, or dealing with an urgent need for knowledge to solve a problem

(Gambrell, 1996; Goodman & Niles, 1970). Their action demonstrates self-regulation of learning, supported by their motivation to achieve a learning goal or desired outcome.

For the participants in this study, the books they downloaded addressed their purposes for their reading tasks. Zimmerman (1990) explains that self-regulated learners engage their agency for learning, displaying both motivation and action related to their learning goals. Downloading and borrowing eBooks to address their learning goals and unique purposes for reading is evidence of these participants' self-regulatory learning actions.

### **Utilitarian Uses**

Using the eReader in utilitarian ways, the participants demonstrated their ability to self-regulate their learning in areas of personal interest and classroom content. "Our teacher assigned us an assignment in *Google Class* and when I got home I watched the video she assigned because I didn't get to finish in class" (Student Two, Focus Group, October 18, 2016). In addition to the classroom content, the participants' self-regulated learning behaviors stemmed from individual interests or personal learning goals. "I got a learn Spanish dictionary. You can watch videos for vocabulary learning. It has phrases. They are kind of hard for me to pronounce. That's why I watch the videos. After they pronounce them you practice them" (Student Six, Focus Group, October 4, 2016). It was evident in their statements that the eReaders were used to assist the participants in new skill development and learning. "Sometimes there are a few words in *The Force Awakens* that I don't understand, so I use the dictionary. I highlight the word and put a note and the description of what it means, so I know the word" (Student Two, Focus Group, September 20, 2016). Language development, online gameplay, and vocabulary learning were among the refinements and advancements of their existing skills.

These skills were enhanced by the utilitarian uses of the eReader and motivated by the participants personal learning goals.

The findings provide a glimpse of these participants as readers, who engage their agency in purposeful ways self-regulating their selection of reading material to address a variety of needs including skill development, learning, and entertainment. They approached their self-selected reading tasks diligently, managing and controlling their effort and demonstrating the confidence, and resourcefulness needed to complete the task (Pintrich & De Groot, 1990; Zimmerman, 1990). The results of this research study may provide classroom teachers with new knowledge about the purposeful choices students make in their reading behaviors when they have the autonomy to self-select their reading material and access to both digital and printed books.

### **Recommendations**

Based on the research results, the following recommendations are being made to administrators and teachers that are interested in creating learning environments that bolster reading engagement among their students.

**Recommendation 1: Empower teachers to apply the technology in the classroom by providing them access to eReaders.** For this study, the eReading device used was a Kindle® from Amazon. However, any tablet or laptop computer with internet connectivity and a color screen will suffice. Once the teachers have the eReaders, they can conduct an investigation of possible eReading experiences by accessing any of the free online digital libraries including Amazon's eBook store, Project Gutenberg, and most public libraries. This investigation will



provide the classroom teacher with thousands of free titles and options for an eReading experience with students.

**Recommendation 2: Develop partnerships with a local library.** Through the ConnectEd program schools and libraries had access to e-Rate funding to increase their broadband capacity (ConnectEd, n.d.). In many locations, this funding stream has resulted in upgrades to the digital infrastructure and improved accessibility to digital services available through the library. By creating partnerships between schools and libraries students can acquire library cards to access downloadable eBook collections allowing them to self-select titles that fit the purposes they have for eReading activities. Self-selection of eBooks was a primary factor in the self-regulated learning displayed by the participants of this study.

**Recommendation 3: Encourage students to begin a limited investigation of other online and digital libraries.** Once students have had an opportunity to experience the process of selecting, downloading and reading from an eBook they can begin to experience the vast collections of digital reading material available online. A Google search for free eBooks will yield millions of possible links to visit. This number of sites can be overwhelming and unproductive. By accessing the most common open libraries including the Amazon eBook store and Project Gutenberg, students will gain access to many more titles and genres that can be read in an academic year. eBooks available from these and many of the online and open libraries can provide the learners a title and genre that can meet their particular interests and purposes for reading.

**Recommendation 4: Provide an environment for learners to engage in social interactions**

**with other students that chose the same titles and genres.** In so doing, teachers are providing the students with access to classmates that are able to assist them in meeting the reading purpose they determined when they made their eBook selection. This, in turn, helps them meet their individual purposes for their eReading experiences. After the participants in the study selected and read their eBooks they sought social interaction around the reading experiences. Much like the interaction of a book club, these learners shared details about the characters and stories they were reading (Ivey 2014). They recommended titles to each other and sought reinforcement for their selection supporting a positive attitude toward reading (Merga, 2014). They engaged in both formal dialogues about the elements of the story and in informal conversations about how the eBooks supported their purpose for reading such as improving gameplay skills, or how the title aligned with a movie series. In these social interactions the teacher played a small role in creating links between students when they had similar titles, subjects or purposes for reading. By creating these opportunities for social interaction students' eReading experiences can be reinforced leading to more eReading.

**Recommendation 5: Develop and teach a unit on the affordances of the eReader.** This

instructional unit can focus on the technical skills a student will need so he or she can have a customized eReading experience. Ebooks and eReaders offer some affordances that can customize the eReading experience (Ciampa, 2012; Cavanaugh, 2002; Zucker, Moody, & McKenna, 2009). These affordances include dictionaries, annotating capabilities, comprehension supports, and links to social media, among others. Use of these affordances are not intuitive and may require instruction. A unit of study that provides practice on these eReading skills will

support the learners as they delve into eReading and make the eReading experience more supportive of the self-regulated learning goals they hold.

By applying these recommendations, a foundation will be created for a self-regulated, eReading program within schools.

### **Conclusion**

The Kindle® eReader proved to be a valuable tool for accessing a world of reading material that could not be housed in a single elementary school library. It made available tools that supported the reading and enhanced the reader's ability to interact with the texts. With instruction on the affordances of the eReader, and guidance for selecting engaging reading material, deploying eReaders with intermediate grade students may reinforce engagement with eTexts and be an effective supplement to a traditional print book reading program.

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**Cultivating Future 21<sup>st</sup> Century Literacy Teachers: An Examination of the Perceptions of  
Pre-service Teachers and Technology Integration**

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*Abstract:*

Preparing pre-service teachers to teach in the 21st century is the goal of most teaching programs, yet graduating teachers are still entering schools unprepared to use technology in meaningful ways. This research focuses on three cohorts of pre-service teachers who took a three-course literacy block using a modeled approach to teaching literacy with technology. Using a qualitative exploratory design and content analysis (Stelmer, 2001), pre-service teachers' voices were analyzed to investigate what contributes to their understanding of technology integration and how their perceptions are shaped by coursework and field placements. The findings generated important implications about teaching with technology in regard to technology integration not being a one-size-fits-all model, the pre-service teachers perceived confidence being conditional, and exploration opportunities being integral to successful application. This study serves as a foundation to consider how and in what ways technology can be used to help prepare future teachers to be ready for 21st century classrooms.

*Keywords:* technology integration, pre-service teachers, teacher preparation, 21<sup>st</sup> century literacy learning

*“Today’s students need and deserve the skills, strategies, and insights to successfully exploit the rapidly changing information and communication technologies that continually emerge in the world” (Larson, 2008, p. 12)*

Teaching K12 students the skills and strategies necessary to thrive as active contributors in a participatory culture (Jenkins, Purushotma, Weigel, Clinton, Robison, 2009) requires teachers to be adept at integrating technology in seamless ways that both engage learners and contribute to their growing understanding of 21<sup>st</sup> century scholarship. Therefore, teacher educators must illustrate for pre-service teachers how to integrate both innovative technology and the way it can enhance learning for students. Pre-service teachers are change agents (Kidd, 2013), yet teacher educators cannot assume that pre-service teachers value and utilize digital technology in meaningful ways on a consistent basis (Hutchison & Wang, 2012). Future educators need to understand that, “students are entering an age when knowledge of technology is a necessity and not a luxury” (Gambrell, Malloy, Marinak, & Mazzoni, 2015). So, it seems that preparing future teachers to face the unique challenges of teaching in the 21<sup>st</sup> century is not only an area of great prominence for teacher educators, but it is also a professional responsibility.

This increased use of digital tools is transforming the way teacher educators can share information, connect with one another, and what it means to be literate (Beach, 2012). An important consideration for teacher educators is how we are preparing pre-service teachers to teach in the 21<sup>st</sup> century and how to equip them with the tools and experiences to make a successful transition into the classroom. The responsibility is then thrust on universities and teacher educators to prepare future teachers for this changing landscape where the population of pre-service teachers need experience using and teaching with digital literacies.

The purpose of this study was to investigate pre-service teachers' perceptions of pedagogy while infusing technology and how their experiences help or hinder their conceptions of teaching elementary school in the 21<sup>st</sup> century. Kolb (2008) advocates that pre-service teachers need to be supported in their technology integration by seeing everyday pedagogical strategies modeled daily, and this study investigated an approach to elementary literacy instruction that resulted in pre-service teachers using multiple modalities of technology through exposure and application of digital literacies practices in both their college classroom and through their field placements.

The primary research question that informed this study is: How do undergraduate pre-service teachers perceive the inclusion of technology while instructing and assessing elementary literacy practices? The two underlying questions that helped to clarify pre-service teachers' perceptions are: 1) What experiences help to shape their beliefs about teaching with technology? and 2) How do their perceptions shape pre-service visions for future practice? The coursework and experiences are significant in order to consider how these components work in tandem and also isolation to contribute to pre-service teachers' perceptions.

### **Theoretical Framework**

The study was grounded using two primary principles: (1) Technology and other media sources provide elementary students a form of access to text and appropriate instructional tools, and (2) Pre-service teachers are actively constructing their own vision for future practice during coursework and fieldwork. Mishra and Koehler's (2006) TPACK Framework (Teacher Pedagogical Application of Content Knowledge) help to substantiate these principles about pre-service teachers' understandings of technology integration. The TPACK (Mishra & Koehler, 2006) framework delineates the knowledge a pre-service teacher must have in order to effectively deliver instruction where technology enhances learning. The TPACK framework

describes the coinciding areas of knowledge that are integral for teachers to teach content effectively with digital mediums and applications. The TPACK is illustrated using three overlapping circles of knowledge: pedagogy, content knowledge, and technology. The intersection of all three circles is the goal for instruction where teacher knowledge and instruction promote elementary students' development of digital literacy practices. Grounding instruction using the TPACK framework helps teacher educators conceptualize how technology can be incorporated into teaching and learning. It allows teacher educators to carry out effective instruction, but also addresses the personal and social influences that are integral to make teaching with technology meaningful and sustainable.

A separate construct uses the work from pre-service teacher beliefs and vision (Mercado & Turner, 2010; Vannatta, 2000) and the growing body of literature regarding technology integration among pre-service teachers (Abbitt, 2011; Koehler & Mishra, 2009). An important consideration is also how action research has aided pre-service teachers in their inquiry and evaluation of teaching practices (Hagevik, Aydeniz, & Rowell, 2012; Hulse & Hulme, 2012). Although the TPACK (Mishra & Koehler, 2006) provides the foundation to consider the knowledge pre-service teachers must draw upon, it is also important to understand that pre-service teachers often struggle to integrate technology in their field experiences due to pedagogical complexities and educational contexts (Dawson & Dana, 2007). Yet, researchers find that opportunities for pre-service teachers to utilize technological tools in field experiences encourage technology integration and help shape perceptions and attitudes toward technology integration (Mason, 2000).

Students' understanding of text and literacy practices continue to involve digital mobile devices (Cardullo, 2013; Wilson, Briere, & Nahachewsky, 2015), and researchers identify that

eBooks and mobile devices can change the face of education (Neuman & Gambrell, 2014). Part of developing pre-service teachers' TPACK (Mishra & Koehler, 2006) involves allowing pre-service teachers' learning about technology through modeling and engagement (Vannatta, 2000) and developing a high level of digital literacy themselves while simultaneously learning how to use a range of technologies within digital pedagogies (Milton & Vozzo, 2013). Most importantly, if pre-service teachers can navigate the technological landscape, they can help their students understand how to draw upon various modes to meet the challenges of the twenty-first century (Borsheim, Merritt & Reed, 2008).

These frameworks are important to pre-service teachers and illustrate the many areas of knowledge a teacher must possess in order to be successful in teaching content with technology. For a pre-service teacher, these areas of expertise are developing. As teacher educators consider the TPACK and the overlapping areas of expertise necessary to thrive in 21<sup>st</sup> century classrooms, it would seem obvious that any teacher new to the field would struggle to teach without opportunities to apply those simultaneous understandings. Therefore, it is important to support them in their exploration of how to integrate technology and to find ways to problem-solve while using their developing knowledge.

### **Methodology**

This study sought to understand undergraduate pre-service teachers' perceptions about technology integration, and a qualitative research design was employed to collect data to answer the research questions (Patton, 2002). This method allowed for the analysis to reveal the pre-service teachers' contextual worlds through their experiences. This qualitative research analyzed how the experiences of pre-service teachers helped to shape their visions for future practice.



Partial class time was spent sharing, modeling and then later scaffolding the use of different websites and applications during content area methods instruction.

### **Selection of Participants**

This study took place at a small, suburban commonwealth campus with approximately 3200 students. During the junior year, elementary education pre-service teachers are enrolled in a three-course literacy methods block and a corresponding 2-day field placement for two hours each day. The PSTs were from three cohorts with ten to twelve PSTs in each cohort. The participants were recruited from the PSTs during their senior year once they had already completed their junior-year coursework. The first cohort was conducted as a pilot study and consisted of 11 PSTs. The remaining 23 PSTs were participants in the larger study that helped to broaden and fill out the themes originally developed through the pilot study.

The senior year placements are in stark contrast to the junior-year experience because the placements are in under-resourced schools. This divergence from the PSTs' junior-level placement made it important to build a sense of how the pre-service teachers perceived their TPACK knowledge when faced with the realities of their current urban school placements with limited abilities of implementing technology. This massive divergence between field experiences offers a space to reflect on what they learned and how it helped cultivate the pre-service teachers' visions of future practice.

### **Modeled Approach to Technology Integration**

During the three-course literacy block numerous opportunities for modeling, exploration, and application were given to the pre-service teachers for both instructional and assessment purposes. Pre-service teachers explored various web sites and applications through classroom activities and assignments. The assignments incorporated the concurrent elementary field

experience placements where the pre-service teachers provided a limited amount of instruction to children and used classroom experiences to implement class assignments in placement classrooms. Table 1 below outlines the courses and the technological applications introduced and applied in the courses. It illustrates examples that were used in class and the assignments that demanded technological literacy knowledge. The list below is not exhaustive but highlights some of the ways PSTs were exposed to different tools expanding on literacy objectives.

Table 1: Digital Applications and Assignments for Junior Block

<b>Literacy Course Name</b>	<b>Examples of Digital Applications and Websites</b>	<b>Assignments utilizing Technical Applications</b>
Teaching Reading in Elementary Schools	<ul style="list-style-type: none"> <li>• Shadow Puppet app</li> <li>• Sock Puppets app</li> <li>• Chatterpix app</li> <li>• <a href="http://www.popplet.com">www.popplet.com</a></li> <li>• Trading cards app</li> <li>• Talking hippo app</li> <li>• Glow Paint app</li> <li>• Nearpod app</li> </ul>	<ul style="list-style-type: none"> <li>• Website development</li> <li>• Research technological application</li> </ul>
Teaching Writing in Elementary Schools	<ul style="list-style-type: none"> <li>• <a href="http://www.pixton.com">www.pixton.com</a></li> <li>• <a href="http://www.emaze.com">www.emaze.com</a></li> <li>• <a href="http://www.kidblog.com">www.kidblog.com</a></li> <li>• 30 Hands app</li> <li>• CapDis app</li> <li>• Book Creator app</li> <li>• <a href="http://www.twitter.com">www.twitter.com</a></li> <li>• <a href="http://www.wonderopolis.com">www.wonderopolis.com</a></li> </ul>	<ul style="list-style-type: none"> <li>• Digital photo journal</li> <li>• Action research with technological application</li> <li>• Blogging</li> </ul>
Teaching Children’s Literature	<ul style="list-style-type: none"> <li>• <a href="http://www.arounder.com">www.arounder.com</a></li> <li>• Goosechase app</li> <li>• News-o-Matic app</li> <li>• Epic app</li> <li>• QR scanner/generator</li> <li>• Socrative app</li> <li>• <a href="http://www.pinterest.com">www.pinterest.com</a></li> <li>• <a href="http://www.padlet.com">www.padlet.com</a></li> <li>• Photo collage app</li> </ul>	<ul style="list-style-type: none"> <li>• iMovie creation</li> <li>• Action research/inquiry findings about technological application</li> </ul>

This approach was developed to include technology in the pre-service teaching experience. Currently, no educational technology courses exist in the elementary education program for the pre-service teachers. Integrating technology into pre-service teacher education through the use of modeling, using, implementing, and applying their learning, the pre-service teachers are able to develop their own TPACK (Mishra & Koehler, 2006) knowledge so they can create instruction that is focused on literacy goals rather than the technology they use.

### **Data Sources**

Anecdotal records, artifact analysis, questionnaires and focus group interviews were the methods of data collection used consistently with qualitative research design (Merriam, 2002). The data collection and analyses aimed to clarify how pre-service teachers perceived their experience and to understand whether their experiences helped or hindered their general conceptions of teaching literacy with technology. Anecdotal records were taken during class sessions where the pre-service teachers were using different websites and applications. The researcher recorded observations of the pre-service teachers' reactions, discussions and overall use of the technological tools to teach literacy concepts. The researcher also collected a baseline reflection regarding the role of technology on literacy instruction at the beginning of each term. A final vision statement was collected at the completion of the course and was later analyzed to identify patterns about their beliefs for future practice.

A questionnaire adapted from Schmidt, Baran, Thompson, Koehler, Shin, and Mishra (2009), which was correlated with the TPACK framework was distributed to the consenting participants. The questionnaire included both closed-ended Likert scale survey items as well as several open-ended questions. Focus group interviews were conducted following the administration of the questionnaire to gather more information about the pre-service teachers'

experiences and gather contextual evidence about their reflections. The interviews captured a more thorough understanding of the artifact analysis and provided an in-depth discussion of the pre-service teachers' beliefs about their perceived role of technology in classroom instruction. Focus group interviews give researchers an opportunity to view the world we do not experience ourselves (Krueger & Casey, 2008). The importance of capturing the pre-service teachers' beliefs was an attempt to more profoundly understand the phenomenon being investigated.

### **Data Analysis**

The researcher analyzed the data with specific strategies and across multiple sources in an ongoing and systematic manner using content analysis (Taylor-Powell & Renner, 2003) to identify categories and patterns of how pre-service teachers perceive teaching in the 21<sup>st</sup> century and what shaped those conceptions. Assertions generated from across all data sources and interpretive commentary connected the assertions. Merriam (2002) describes content analysis as analyzing interviews, field notes, and documents so a researcher can seek to find themes and reoccurring patterns of meaning. The researcher transcribed the interview data after listening to the recordings several times, looking at the information from different lenses. The researcher looked for counterpoint evidence and identified emerging categories. The researcher continued to compare categories and themes from each of the data sources within and between artifacts to look for patterns and outliers. Descriptive statistics were used for the survey items to analyze the pre-service teachers' responses and look for patterns in their perceptions about teaching with technology. The researcher triangulated the different data sources through the comparison of multiple data sources. The multiple sources confirmed interpretive accuracy and validated the

themes. As a means of maintaining reliability, the researcher also used member checking with participants.

### **Role of the Researcher**

Data collection took place with one course instructor. I was both the instructor and the researcher in this study. The role of the qualitative researcher ranges on a continuum from a fully-present researcher and a co-participant, to a researcher who experiences the investigation, without being fully involved in the events (Rossman & Rallis, 2003). I had an active role in the study because I am the course instructor implementing this specific technology-driven approach to literacy instruction. I tried to extricate myself as the center of this work by collecting data following PSTs' coursework and by also allowing them to speak freely about their experiences. Therefore, I collected data after grades were submitted so there would not be evidence of coercion. Creswell (1998) suggests that the qualitative researcher often takes on the role of the active learner and tells a story from the participants' point of view, rather than an expert passing judgment. The researcher's role as an active learner is especially important in today's literacy classrooms. Often, the researcher's own knowledge, within the context of observation or study, constrains or broadens what he/she can observe, and, therefore, he/she is in a position to explain and theorize (Steinkuehler, Black, & Clinton, 2005).

### **Findings**

This study offered an opportunity to understand the PSTs' perceptions more profoundly outside of their junior block experience. The themes generated new insights and offered rich descriptions to clarify the pre-service teachers' perceptions regarding the preparation of future teachers using technology. The themes identified through the data analysis are: 1) Technology integration is not one-size-fits-all, 2) PST technology confidence is conditional, and 3) Literacy

block learning should include opportunities for technology play/exploration. These themes help to generate new insight into how pre-service teachers experience technology integration as students yet reflecting on its use as teachers.

### **Technology Integration Is Not One-Size-Fits-All**

Pre-service teachers shared that they noticed a disconnect between what they learned the previous year and what they had anticipated to use for their senior-year placements and beyond. It did not take long for the pre-service teachers to realize that sometimes learning about technology is how *not* to use it. Teaching with technology does not automatically mean that student learning will be better and the artifacts will be meaningful. During their junior-year the PSTs experienced a model for technology integration that followed Puentedura's (2006) work, which hinged on the SAMR model. The aim of this approach to technology integration is that technology and digital applications should only be used when they can modify and/or transform student learning and outcomes. The PSTs noted that the junior-year placements used technology differently than those in the urban schools during their senior year. They identified that the technology-use in the suburban school was much more meaningful and relevant. For instance, the student artifacts were entrenched in some kind of literacy practice.

The pre-service teachers' urban, senior-year placements were much different. They noticed that the focus of technology integration typically associated with district pre-purchased programs and sometimes had no purpose other than to be an "add-on." In many cases the technology was linked to a district-mandated basal program. Jaime mentioned, "We use programs like Reading Eggs... but it doesn't get linked to anything else we do." Donna reiterated, "We put on videos and then just move on to something else." The PSTs reflected about how technology *should* be used in classrooms, and they were concerned about the

relevance of the technology practices they were experiencing. Felicia remarked, “Throwing elementary students on the computers because the school paid for them doesn’t make it meaningful.” Another PST shared, “We use the Promethean Boards but there are other things we can probably do that would be meaningful and make it more engaging.” They identified that it was a problem when using the Promethean Board typically left the majority of the students at their seats with nothing to do while only one student worked with the board, and they discussed ways this activity could be enhanced using magnetic letters. Furthermore, the mentioned the gap that existed between the two field placement experiences, noting that not having access to the same digital tools does not mean that the technology integration has to be less meaningful. Brooke shared, “Many of the same experiences could be done with one computer, but my teacher just uses the computer for practice games.” Jess echoed that sentiment by adding, “The kids could create something or use the computers to go on virtual field trips or research different things.” The pre-service teachers clearly recognized that the SAMR criteria for technology to modify or transform instructional practices was not being met.

One of the major findings is that technology experience and learning that took place the previous year in one context was not yet applicable in their current context because of some of the constraints they faced. For instance, they found it difficult to make the connections themselves. The PSTs described their mentor teachers as not being comfortable using technology. Practicing teachers often find it difficult to integrate technology into instructional practices (Turbill & Murray, 2006). In this case, both the mentor teachers’ discomfort and the PSTs’ disconnect from what they had previously learned contributed to digital tools not being utilized appropriately. There was an understanding that what they had learned the previous year could not just be replicated in another context. This awareness is incredibly important as they

navigate a space where they understand that a meaningful integration of technology is going to look and feel differently in different learning spaces.

### **Tech Confidence is Conditional**

Although the PSTs had a high level of confidence about technology integration, there was a limitation to that heightened sense of self-assurance. The pre-service teachers' confidence hinged on the belief that they may have relevant technological knowledge worthy of sharing with others. The questionnaire revealed that the PSTs had an increased confidence following the LLED block (mean of 4.25 on a 5-point scale). They felt much less confident in providing leadership to others related to technology integration (a mean score of 3.17). This finding is especially important considering that they had already identified that their mentor teachers were not comfortable using technology. If they were not confident in providing leadership, then they will be less likely to try something different than what their mentor teacher was doing, or even showing their mentor teacher a new way to incorporate a digital tool.

Clearly the introduction to different tools and the technology experience during the PSTs' junior year is a small part of what could be integrated because the tools and resources that could potentially be incorporated into classrooms is endless. Yet, the PSTs had a diverse digital toolkit to begin to utilize, but they still felt ill-equipped to universally integrate technology with complete confidence. Their confidence using different tools was subject to the tool's relevance. As an example, Stella shared, "If I am in a school that does not provide me with professional development with the technology *they* use I don't know how confident I will be." Similarly, Felicia recounted, "Last year I felt confident but this year I am a bit doubtful of my own abilities because the only experience we had with technology was in our literacy courses junior year." Fortunately, Laura had a number of technology-rich experiences in her multiple field



placements and said, “I feel confident because I have seen so many different things being done in different placements. I have a number of experiences to draw from.” Jess recounted, “Although my cooperating teacher did a lot of work with the iPads and Chromebooks, I just don’t remember some of the specifics. I remember a few of the apps, but I don’t feel like I know enough to share the information with my cooperating teacher.” The pre-service teachers’ confidence was site and experience-specific. They had difficulty feeling confident about their technological knowledge in a new context where technology was being used differently.

They found that the experiences during their senior year focused on programmatic connections that did not help them increase their understanding of how to meaningfully deliver literacy instruction using technology thus limiting their knowledge and confidence. A teacher educator goal of providing multiple tools, experiences and connections is to allow pre-service teachers to build their TPACK knowledge (Mishra & Koehler, 2006) while another important goal is to build their confidence using technology. Unfortunately, PSTs’ confidence hinges on unmanageable variables from different contexts. The rich experiential learning afforded to the PSTs did not sustain them through the technology terrain of another school context.

### **Technology Exploration is Essential**

Being immersed in opportunities to explore digital tools and reflect about how they work in different contexts helped shape the PSTs’ understandings about how technology can be integrated into elementary content-area instruction. For example, Talia remarked, “I used to think that technology hinders education more than it enhances it, but now I think that meaningful uses with technology can help make instruction more focused.” The pre-service teachers spoke specifically about the course assignments that helped illustrate the ways in which technology could meaningfully support instruction and assessment. Two of the projects that were mentioned

were the iMovie and the technology-integration action research project. Figure 1 is a screen shot of the iMovie Talia produced for her second-grade field placement classroom. She was able to effectively integrate technology into a literacy lesson related to a unit on the life cycle of a butterfly.



Figure 1: iMovie Example for Pre-Service Teacher

Similarly, Felicia remarked, “Our technology-integration action research project offered me an opportunity to explore forms of online collaboration in classrooms with full support from our instructor, which I would not have time to do in another situation.” She commented about being afforded that opportunity and how it offered her a valuable learning opportunity to reflect on what she could do differently with elementary students in her own classroom. Felicia designed her technology inquiry project around the use of Google Expedition with third grade students. She learned about the preparation, the teaching, the modeling needed, and the pitfalls one can face. This opportunity allowed her to experience a redefining task (Puentedura, 2006) that would not have not been possible without the technology.

The pre-service teachers discussed specific applications used during the junior methods

coursework and the ways the apps and sites were used in class and also how they could be used with elementary students. The application of certain digital tools such as Goosechase (an online scavenger hunt) and Shadow Puppet (a video-creation tool) offered the pre-service teachers different opportunities that were aligned to authentic tasks for specific teaching purposes. Not only were they modeled, but the PSTs were given a specific task relevant to course content they needed to complete using these (and other) tools. They were also given time to reflect about these experiences and how they might be used in elementary classrooms. The PSTs were also given space to explore other self-identified digital tools and share those with one another. Figure 2 is a screen shot from a class activity that demonstrates how the PSTs' were able to multimodally define literacy. They combined using an applicable app with a meaningful task, thus having them collaborate about what it means to be literate in today's classrooms.



Figure 2: "What is Literacy?" Activity

The PSTs also identified that, "Collaboration is essential," identifying the importance of working together and building from one another's ideas. Stella shared, "I think about the inquiry project I did last year with blogging... I would never be able to do that in my current placement because

we only have 6 laptops available.” Laura also iterated, “We had the space to do the action research projects... we had opportunity, guidance, feedback and time.” Brooke reported, “We were able to work a partner on most of our projects so we could use each other to build our ideas.” Stella again shared, “The time we had to share our ideas with the whole group, ask questions and give suggestions gave me direction when I was stuck.” The pre-service teachers valued these types of opportunities, and felt the time and integration of content, pedagogy and technology allowed them to use different elements of technology. Muharis & Ziemke (2015) advocate that teachers should use some element of a digital playground when allowing students “try” different digital tools. The “play” time and means for applying digital tools in different ways is essential to allowing PSTs a chance to understand the uses for different technological while experiencing some of the pitfalls that may exist.

### **Discussion**

The findings from this study help connect important points for discussion related to the research questions. Martin (2008) describes digital literacy as

the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations (p. 167).

Our job in educating future teachers is to reflect on how teachers can do this while teaching our particular pedagogy. One of the important findings from this study identified not only issues related to technology but also the inequities between the different schools where the pre-service

teachers were placed. One experience was more meaningful because of a number of factors that included: 1) it had more technology available, 2) there was more support for teachers to learn new technologies and take risks, and 3) it allowed PSTs to work together to engage in innovative practices. The combination of the two divergent field placements was valuable for the PSTs because they had experience with a technology-rich school context and one with limited means. It also illustrates the need for teachers to be responsive in providing meaningful and varied opportunities with technology. Varied opportunities need multiple approaches to teaching using technology. In particular, the PSTs of tomorrow's schools need to learn how to integrate technology in *all* school contexts, whether there is limited or an overabundance of access to technology and digital tools. Specifically, as teacher educators we need to provide experiences where pre-service teachers learn how to promote digital equity and enrich opportunities for elementary students having access to only one iPad or a finite number of devices (Author & Turner, 2018).

The findings reveal that the pre-service teachers found great value in being exposed to different digital tools and opportunities to problem-solve, explore and generate a technology-based inquiry finding their own answers, which is an important 21<sup>st</sup> century skill. Toyoma (2015) proposes that technology in education should, “amplify whatever pedagogical capacity is already there.” Teacher educators need to move into redefining technology integration by providing opportunities to demonstrate how teachers can create new tasks that only digital tools can help to support, transforming teaching and learning with technology. Using the TPACK model (Mishra & Koehler, 2006) helps to provide general understandings where teachers, faculty members and schools can show specific uses to augment, modify and redefine instruction using technology. Specifically, in this context, by using the TPACK as a model for course design and instruction,

technology modeling and application was a built-in part of the literacy methods coursework. It was not an add-on, but rather the goal was to use the overlapping circles of knowledge as the foundation for course design, activities and assignments.

It is important to provide both general and more focused tools and opportunities. Similarly, there should be opportunities for discussion and exploration to determine different ways of using different tools. By providing time to reflect, pre-service can begin to unpack and discuss how the experiences in a digital-rich school could be applied and adapted for students in a school with limited technology and resources so they could also experience the same important 21<sup>st</sup> century learning. PSTs need to take risks and try strategies that incorporate content knowledge, pedagogical knowledge and technological knowledge regardless of the teacher whose classroom the PST is placed in and the field placement.

These findings indicate that pre-service teachers each valued their experiences exploring, practicing and integrating technology into instruction and assessment. Even pre-service teachers who did not embrace technology and noted that they were “technologically challenged,” later commented that technology has the potential to enhance literacy instruction. They valued the opportunity to try different tools in different contexts while applying relevant literacy skills. They similarly appreciated using different apps and digital tools *with* students, thus illustrating how teacher educators can help to form PSTs’ growing TPACK incorporating pedagogy, content knowledge, and knowledge of technology. The PSTs recognized that technology needs to be used in meaningful ways for authentic purposes. For instance, allowing elementary students to create multi-media book teasers to illustrate their understanding of a book applies a number of both traditional and 21<sup>st</sup> century literacy skills. The findings reveal that the PSTs have varying

degrees of what the technology integration will look like based on their own personal and professional experiences, yet they look forward to future professional development to continue their growth.

### **Implications for Teacher Educators**

In consideration of the research questions and what it means for future and practicing teachers, it is important to consider a few implications for teacher educators and 21<sup>st</sup> century teacher preparation. First, because technology is not a one-size-fits-all blanket that can be applied to any school context, it is important to demonstrate for PSTs ways in which they can use technology to teach their content as well as offer them a means to reflect and problem-solve when they are in school contexts with limited means. One way to offer PSTs some additional support is through introducing them to resources available on the web such as those on social media, through podcasts and blogs, and through YouTube channels (Author & Turner, 2018). Similarly, as teacher educators are cultivating spaces where technology integration is meaningful and relevant, they can model how teaching with digital tools is about transforming instructional and assessment practices to prepare *all* students to think critically and fully participate in 21<sup>st</sup> century classrooms. So instead of university faculty asking PSTs to put their technology away in classrooms, they can instead teach them *how* to use it appropriately during lectures and classroom activities. For instance, the use of Twitter, back channels, and text organization applications can be illustrated and applied. Creating a space for social networking or collaboration among PSTs will enable them to problem-solve and also support their continued growth.

The goal of technology integration is to illustrate enriching experiences for K12 students. It should take them outside the classroom, into spaces that expand their thinking and deepen their

schema. Puentedura's (2006) work with the SAMR model (Substitution, Augmentation, Modification, and Redefinition) offers teacher educators a vehicle for using integrative practices. The goal is to redefine instruction, allowing PSTs a space to create learning tasks and assessments where technology is used in ways otherwise inconceivable. An example of this is having elementary students creating multimedia content as a means of assessing understanding. The learning that occurs when a student creates an iMovie is far more consequential than writing a paper about instruction and assessment. Opportunities such as these can help to boost confidence, and similarly provide an application-based learning environment where PSTs can add to their growing TPACK. Similarly, by offering PSTs time to put the pieces together, to process and to share how technology is being used (and not used) in classrooms we as teacher educators can provide a space to problem-solve and share possible solutions to the challenges in today's classrooms. By offering PSTs opportunities to discuss and reflect we are offering them a chance to learn from one another. Hicks and Turner (2013) said it best: "Digital literacy is no longer a luxury, and we simply cannot wait to build the capacity in our students and colleagues, as well as ourselves" (p. 64).

Since the researcher was also the course instructor and therefore able to use the results of this study to inform instruction, there have been multiple adaptations to the courses. A few of the enhancements for the literacy methods coursework involves the means and dissemination of the assignments and activities that utilize technology. For example, in lieu of submitting papers to the course instructor as a means of reflection, the PSTs instead post to an online portfolio site that is often used in elementary classrooms. The course uses the online app/platform Seesaw to post and reply to one another's reflections about their literacy field experiences. Similarly, the course now requires the PSTs to blog and connect in professional learning community (PLC) groups similar to an elementary classroom. This exercise helps them write for a different audience and learn how to connect and collaborate with peers. The collaboration has extended beyond the typical university classroom walls, and the PSTs now connect



with other PSTs at a university across the country while they explore technology integration through collaborative blogging. As a result, the across-university blogging resulted in an expansion of the PSTs' professional learning and also served as a conduit for meaningful technology use (Author, Friedrich & Appleget, 2018). Another course enhancement is the way in which the PSTs evaluate and integrate digital tools. The PSTs are now required to curate a selection of apps and websites to consider the multiple groups of students they may encounter and the apps' important considerations including: strengths, weaknesses, (teaching) opportunities, and threats (SWOT). As this course continues to be adapted, PSTs will need to align their lessons to state standards and also specifically address how the International Society for Technology in Education (ISTE) standards will be aligned through their lessons in order to make the technological integration intentional and be aligned to the instruction and assessment outcomes for the curriculum.

### **Conclusion**

This study is important because it identifies a growing professional need for teacher educators to include technology into education methods courses. Given modeling, a chance for exploration, opportunities for application and a means to demonstrate growing knowledge of content and pedagogy through technological approaches, pre-service teachers can identify their role in delivering appropriate instruction utilizing technological mediums. Through communication and dialogue occurring between groups of pre-service teachers they can glean important insight, share relevant challenges for technology integration and create experiences to make meaningful experiences for their students. This work illustrates how pre-service teachers perceive technology integration and how it begins to unpack what considerations, experiences and opportunities help to prepare future teachers for the changing climate of schools. In addition, it illustrates the ways in which teacher educators can enhance their content methods coursework to include technology. Twenty-first century learning is an important goal, yet the onus relies on teacher educators to adequately prepare those facing the future classrooms.

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**Book Review: Digitized Lives: Culture, Power, and Social Change in the Internet Era**

**Reed, T.V. New York: Routledge, 2019 (2nd Ed.). ISBN: 978-1-138-30954-8. Chapters 11;  
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Reed poses intriguing questions exploring the cultural effects of digital technology in this second edition of *Digitized Lives: Culture, Power, and Social Change in the Internet Era*. Moving beyond the overplayed conversations of cultural and societal change precipitated by a connected world, Reed pulls back the curtain to explore the foundations of digital technology and its implications beyond its users and uses. Perhaps most beneficial in the volume is the detail in which Reed describes and evaluates the seemingly invisible layers of digital technology from inception, to production, to environmental implications. This is particularly important for the newest generation of communication students: digital natives that may take for granted the connectivity of their universe.

From the outset of *Digitized Lives* Reed rejects technological determinism, presenting a technocultural approach to understanding digital culture. This approach recognizes the symbiotic relationship of technology and culture, and thus establishes the basis of many of Reed's conclusions throughout the volume. Rightly, Reed recognizes the temporality of his topic, and challenges the reader to apply the discussed concepts to further digital culture developments.

The first two chapters of the book serve as a thorough introduction to the study of digital culture and digital technology, first by describing in detail the theoretical and methodological approaches most common to scholarship in the field while situating the author's position and focus. Reed challenges, defines, and describes key terms that students will most certainly find necessary for further exploration and deep understanding of the topic and of communication studies in general. After establishing this baseline knowledge Reed zooms out, giving the reader a macro view of the development of digital technology, the issues of its production, and implications for social and environmental justice. Reed uses this opportunity to discuss hegemony and the proliferation of power structures that serve some while leaving most behind,



including the lack of female and minority developers, the exploitation of workers that produce the technology, and the disproportionate burden of adverse environmental effects felt by regions whose use of energy associated with digital communication technology pales in comparison to more powerful and wealthier regions. These are the layers of effects that are hidden from view by those of us who are privileged enough to use our smartphones, laptops, tablets, streaming services, and smartwatches throughout the day without worrying about where they came from, how to pay for them, how to pay for their use, and how to pay for the energy to keep them usable.

Reed then dives into the effects of digital technology on society writ large, doubling down on the technocultural perspective by asserting that “[w]hile there are few if any areas of cultural life solely or wholly created or determined by digital media, there are few if any areas of cultural life that have not been reshaped to one degree or another by digital media” (p. 53). One of these areas is the creation of “cyberspace,” which seems ethereal to users, but as Reed argues, cyberspace is very much material (due to cords, routers, cables, servers, towers, and the like that make up the infrastructure of cyberspace) and not entirely virtual. Reed challenges the virtuality of cyberspace by asserting that the online world reflects (although not perfectly) the offline world. The exploration of this online/offline relationship forms the structure of the remainder of the volume as Reed interrogates several topical issues in digital culture, including privacy, equality, sex, politics, gaming, education, the digital divide, and artificial intelligence.

In each chapter, Reed blends foundational theories, contemporary research, relevant key terms, and thoughtful anecdotes to guide the reader through both sides of the seemingly simple question, “Is digital technology good or bad?” The answer that Reed repeats throughout the volume is that digital technology is not either good or bad, but it simply *is*. Digital technology is

what we make of it, it has the power that we give to it, and it affects society in sometimes surprising and sometimes utterly predictable ways. Like any trendy object of study (Caffeine! Cannabis! Carbohydrates!), the research can tell conflicting stories; the answer is probably somewhere in the middle.

This is a letdown for readers seeking definitive conclusions, but the purpose of *Digitized Lives* is not to be definitive. Its purpose is to engage cross-generational readers in a dialogue about the relationship of digital technology and culture. Although Reed does not offer groundbreaking arguments, he does provide a thoughtful and thorough overview of current controversies and research by introducing foundational knowledge about the fields of communication studies, media studies, and cultural studies and by drawing upon scholarship across each of these fields. *Digitized Lives* is an engaging volume that would enhance the reading list for upper-level undergraduate or graduate-level courses.