

It's not what you think, but how you think: Cultivating inquiry in the digital age

Theresa Redmond Appalachian State University, Boone, NC U.S.A, Evelien Schilder RIPE NCC, Amsterdam, The Netherlands, Jennifer Luetkemeyer Appalachian State University, Boone, NC U.S.A

Keywords: media literacy, media education, information literacy, media and information literacy, higher order thinking, critical thinking

Abstract

Media and Information Literacy (MIL) comprise essential knowledge structures and skills for people of all ages across the world. Required for active engagement in myriad aspects of life, MIL has the potential to sustain not only individuals, but also communities and democracies. Yet, moving from theory to practice is a complex, dynamic process that requires more than the development of knowledge structures and skills. This paper shares research that examined the challenges of practice by exploring strategies to evaluate and assess learning outcomes in MIL. Specifically, we studied the complexity of undergraduate students' inquiry skills before and after a course in media and information literacy. We share the implications of our work, ultimately suggesting that a commonality across the literacies comprised by media education is to cultivate inquiry and that it is complexity— or students' capacity for relational thinking— not content knowledge, that is of deep importance for future learning. thinking.

Introduction

As we enter the third decade of the twenty-first century, augmented conceptions of literacy— such as visual literacy, information literacy, media literacy, and news literacy— continue to rapidly gain visibility and importance as necessary components of a complete, relevant, and effective education. Together, these emerging notions of literacy represent a hybrid response to the need to prepare people of all ages to meet the challenges of changing communication forms, specifically the implications innumerable platforms have on the viability of information.

In this paper, we argue that moving from theory to practice is complex, as are the many fields of scholarship associated with studies in literacy and media education. Across these fields, assessment has attempted to evaluate funds of knowledge related to key ideas. Yet, to address the entanglements of blended *information and communication technologies* (ICTs), one must move beyond content to focus on the forms of information, which demands attention to myriad dimensions of multimodal media. Relational thinking is of vital importance for inquiry and enables the learner to attend to the interconnected dimensions of multimodal content. For instance, by relating content such as the camera angles employed in visual media with audience responses, students gain deep insight into how authority is constructed, why, and with what effects. In this way, to build inquiry, practice, and evaluation alike, we must not only assess funds of knowledge, but also the complexity of students' thinking as they actively engage in questioning information in all its forms. In this sense, it's not *what* you know that matters, but rather *how you think* that is of vital importance. We'll address the challenges of applying theory in practice by providing a snapshot of our evaluation strategy for determining the effectiveness of instruction in *media and information literacy* (MIL). This article builds on prior research and, while we will preview the methods and instrumentation in a snapshot section, the purpose of this article is to create conversation across the fields of media literacy, librarianship, and instructional design, and— most importantly— to invite a call to action regarding the promotion of inquiry in contemporary educational contexts.

Literature Review

Context

It is increasingly clear that students lack strong sense media and information literacy (MIL) skills. The Stanford History Education Group's (2016) study of online civic reasoning concluded that students were largely unable to differentiate between false and legitimate information. The research group warned "whether [the Internet] will make us smarter and better informed or more ignorant and narrow-minded will depend on our awareness of this problem and our educational response to it" ("Evaluating Information," 2016: 5). Further, information and communication technologies (ICTs) implicitly contribute to the development of opinions, beliefs, and ideologies that impact socio-cultural and economic interactions, positions, and policies. Multiple constituencies— spanning parents, K-12 teachers, librarians, college faculty, and youth organizations leaders— have called for increased attention to training and professional development for the inclusion and enactment of MIL as a possible solution to misinformation and the perpetuation of ideological bias in ICTs. Especially, community and school librarians have been positioned and pressured to address gaps in student knowledge and skills for identifying misinformation. Yet, while consensus is progressively growing regarding

definitions of MIL, moving from the highly theoretical terrain of this composite field into practice and evaluation is an ongoing challenge.

Increasingly accessed via mobile media, ICTs today are prolific and integrated into every aspect of our lives. For people of all ages, ICTs are a fact of life and shape our experiences in the world as increasingly digital and constructed. Most importantly, ICTs are blended and multimodal. It is no longer possible to sift out the implications of alphabetic text from their font style, size, or companion visuals and sounds. Hyperlinking enhances the multimodal features of content, enabling users to not only explore content on one platform or app, but also to move around in between content, consuming and sharing across platforms and apps. Moreover, ICTs whisk together information with entertainment and commercial content, making the process of determining authorship, agenda, and accuracy infinitely complex. Yet, as digital literacy scholars Rhodes and Robnolt (2009) explain “...schooling continues to be based on hierarchical access to paper-based literacy instead of practices that allow students to explore and utilize the multimodal, non-linear literacies available in digital environments” (158). For K-12 teachers, librarians, and higher education faculty alike, the interconnected and multimodal landscape of ICTs is a formidable challenge in providing a relevant educational experience for today’s students. While librarians historically facilitated students’ learning and preparation regarding a range of research skills, this role is becoming entangled as misinformation and propaganda pervade ICTs and students struggle to separate fact from fiction in other academic areas and in their lives outside of the classroom.

In order to move forward as educated students and citizens into an unsure information future, scholars argue that a new generation of educators and librarians will need to hone their collective knowledge and skills related to the multimodal nature of ICTs and the composite literacy skills demanded through a unified, critical praxis (Casey & Brayton, 2018; Casey & Brayton, 2019; Thompson, 2018). Specifically, “it is vital that the new generation of librarians incorporate the evaluation of [multimodal] content into their information literacy lessons... and deliberately discuss visual information and news stories with users and students” (Thompson, 2018: 382). But what does the incorporation of multimodal content with information literacy look like? How might librarians, K-12 teachers, and higher educational faculty across fields work towards effective practice together? What learning objectives and outcomes unify our work? To provide context for these questions, the next section reviews literature related to multiple emerging conceptions of literacy— from visual literacy to information literacy to news literacy and more— along with sharing assessment efforts that have been employed to evaluate these areas. Then, we offer a deep dive into the literature regarding higher order thinking specifically, which we argue is a common foundation that undergirds these varied literacy fields.

Visual Literacy

Peter Felten (2008) explains “visual literacy involves the ability to understand, produce, and use culturally significant images, objects, and visible actions” (60). Similarly, Susan Metros (2008) defines visual literacy as “the ability to decode and interpret (make meaning from) visual messages and also to be able to encode and compose meaningful visual communications” (103). Finally, The Association of College and Research Libraries (ACRL) emphasizes the importance of both consuming and contributing visuals in their conception as “a set of abilities” that “equip a learner to understand and analyze the contextual, cultural, ethical, aesthetic, intellectual, and technical components involved in the production and use of visual materials” (ACRL, 2011: para. 2). As conveyed by these definitions, visual literacy is a relational skill that requires inquiry into multiple aspects of a message simultaneously, including interpreting and evaluating. Further, according to the conception of visual literacy as both a reading and writing skill, a visually literate person might also create visual materials, requiring attention to both analyzing and synthesizing, or evaluating and constructing.

ACRL has developed a series of learning outcomes and performance indicators that can be used to assess visual literacy in higher education. The learning outcomes identified by ACRL, highlight the importance of relational inquiry by identifying that visually literate student should be able to “examine the relationships of images to each other and uses related images to inform interpretation” (ARCL, 2011: para. 18), as well as “situate an image in its cultural, social, and historical context” (2011: para. 18). A visual literate learner should also be able to recognize when more information about an image is needed, develop questions for further research, and conduct additional research as appropriate (ARCL, 2011).

Although the importance of being visually literate is often discussed, there is not much research on the assessment of visual literacy skills (Bowen, 2017). According to Callow (2008: 616), “very little specific research has been done on the *what* of assessment with even less on the *how* of assessment within multimodal contexts, particularly when assessing the metalanguage students might have about visual images.” However, Bowen recently contributed to the visual literacy assessment research body by developing a visual literacy competency rubric that is based on the SOLO Taxonomy of Biggs and Collis (1982). This is the same framework we adapted in our study measuring the complexity of student inquiry that we will discuss later.

Information Literacy

The definition of “information literacy” has been continually evolving since Paul Zurkowski first introduced the idea of the “information literate” in 1974 (Behrens, 1994). While Zurkowski defined the information literate in the context of the work environment and the specific skills needed to apply information resources in that environment, the term has a

rich history in librarianship. Librarians, especially school and academic librarians, are on the front lines in the battle to create a multiliterate populace. In this effort, the ACRL (2016) released a comprehensive framework, the *Framework for Information Literacy for Higher Education*, that has become central to information literacy. Multiple assessments have been developed over the years in order to determine levels of competency in information literacy. These include the following: Kent State University's Project SAILS (Standardized Assessment of Information Literacy Skills) in 2001; the ITC Literacy Assessment, which later became iSkills; James Madison University's Information Literacy Test (ILT) in 2007; the Tool for Real-Time Assessment of Information Literacy Skills (TRAILS)—another Kent State University contribution; and the Research Readiness Self-Assessment (RRSA) in 2004 (Gross & Latham, 2012). Yet, each of these measures is skills-based, consisting of multiple-choice questions that attempt to objectively assess general knowledge of information literacy concepts and information sources. While knowledge of this type has value, these assessments do not call upon the student to think critically or creatively about information creation and dissemination. However, like visual literacy, information literacy involves attention to multiple concepts. Assessments that examine the interrelationships among these concepts may be better situated to provide powerful insight into students information literacy learning.

Media Literacy

One can find a myriad of definitions of the term “media literacy,” including conceptions offered by The Association for Media Literacy, The Center for Media Literacy, and The Partnership for 21st Century Skills. The broadest and most widely accepted definition of media literacy is shared by the National Association for Media Literacy Education in the United States (NAMLE) who defines media literacy as “the ability to access, analyze, evaluate, create, and act using all forms of communication” (NAMLE, The Basic Definition: para. 1). NAMLE's definition provides consensus across national media literacy communities, in particular the work of British scholars, such as Len Masterman.

Beyond a subject of study alone, Masterman described media literacy as major pedagogic transformation in education (Schilder, 2013), explaining it as a “non-hierarchical teaching mode and a methodology which will promote reflection and critical thinking whilst being as lively, democratic, group-focused and action-oriented as the teacher can make it” (Masterman, 1985: 27). He was one of the first media literacy scholars who called for an inquiry approach, citing the work of Paolo Freire (1970) as a model (Rogow, 2011). Many scholars have since proposed an inquiry-based learning approaches to media literacy education, including Hobbs (1998), Thoman (2013), and Rogow (2011). Most media literacy models have inquiry at their core, such as the Text Audience Production (TAP) model (Duncan, D'Ippolito, Macpherson,

and Wilson, 1998), and NAMLE's "Key questions to ask when analyzing media messages" (NAMLE, 2014).

A range of assessment instruments to evaluate media literacy have been developed by international organizations (e.g. EAVI, 2011; UNESCO, 2013), educational systems in different countries— such as Australia (e.g. Victoria Curriculum and Assessment Authority, 2011), New Zealand (Lealand, 2009), and Europe (see: Hartai, 2014)— and by scholars as well (e.g. Arke and Primack, 2009; Hobbs and Frost, 2013). Although there seems to be agreement that media literacy education is a constructivist endeavor, in which active inquiry and critical thinking are key (NAMLE, 2007), not all assessment efforts reflect this approach. In fact, numerous assessment approaches only assess right or wrong answers, target lower order thinking skills, or employ simple self-assessment approaches. As with information literacy, these types of assessments do not succeed in determining changes in students' critical or creative thinking.

News Literacy

Closely related to media literacy, "news literacy is the acquisition of 21st-century, critical-thinking skills for analyzing and judging the reliability of news and information, differentiating among facts, opinions and assertions in the media we consume, create and distribute" (SchoolJournalism.org, 2019: para 1). While the idea of news literacy is not new, the concept gained national attention during the 2016 U.S. presidential race. Articles, blog posts, lesson plans and general concern about "fake news" began to circulate in earnest, peaking immediately following the election. However, practices in news literacy tend to emphasize issues of truth and credibility, specifically determining fact from fiction, based in processes that examine the alphabetic text via comparison with various sources. But, news literacy is far more multifaceted. As Jacobson (2017) points out, even the images that are posted to social media are a type of news and students should be taught to view it all through a critical lens. In this way, optimal news literacy is anchored in developing relational inquiry, where students might not only consider the language of the text, but also the source or origins of other information, like key quotes or photographs. Several frameworks have been developed to facilitate news literacy, fact-checking, and other credibility assessments— such as "The CRAAP Test" (Blakeslee, 2004), the RADAR Framework (Mandalios, 2013) and the News Lit Quiz (News Literacy Project). Yet, these frameworks typically lack specific attention to the multimodal aspects, such as visual aesthetics, required for students to become fully responsible consumers and creators of news. In this sense, assessment measures continue to limit our approaches to cultivating strong inquiry into the holistic nature of ICTs.

Media and Information Literacy (MIL)

The common aspects spanning the multiple literacies described thus far are so fully and richly aligned that international scholars working with the United Nations Educational, Scientific and Cultural Organization (UNESCO) have developed the powerful, hybrid term *media and information literacy* (MIL). In particular, UNESCO's Media and Information Literacy Curriculum for Teachers articulates the following literacies are included within the larger umbrella of MIL: computer literacy, digital literacy, freedom of expression, information literacy, internet literacy, library literacy, media literacy, and news literacy (Moeller et al., 2011: 13-14). UNESCO's conception of MIL comprises five laws that, collectively, represent a set of complicated and nuanced skills that are necessary to participate equitably in our connected, global culture. MIL responds to literacy learning as a continuum that is not only dynamic, but also temporal and situational. For these reasons and more, UNESCO agrees that developing indicators and metrics to evaluate MIL is a significant challenge. Yet, they contend that "The measurement of MIL is a must for any country that wishes to promote and develop the knowledge societies of its citizens" (Moeller, et al., 2011: 29). In addressing this challenge, we propose that the evaluation of MIL must move beyond skills and competencies with attention to higher order thinking with regards to ICTs.

Higher Order Thinking and Inquiry

Complex and abstract skills are often referred to as *higher order thinking skills*. Even though there has been criticism of dichotomizing thinking, the Taxonomy of Educational Objectives developed by Benjamin Bloom and his colleagues dominates educational research (Alexander et al., 2011). The Taxonomy divides thinking into *lower order thinking*— comprising knowledge, comprehension and application— and *higher order thinking*— encompassing analysis, synthesis and evaluation. Although Bloom et al. (1956) did not specifically define higher order thinking in their taxonomy, much of the writing on higher order thinking referenced their classification in the cognitive domain, with the movement from knowledge to evaluation signifying desired learning from lower order to higher order thinking (Alexander et al., 2011). MIL generally calls for the more abstract skills of the taxonomies that deal with the cognitive domain— specifically the skills to "analyze, evaluate, and create" media messages and to think critically. These skills match the more complex categories of cognitive taxonomies. Yet, scholars outside of Bloom and his colleagues represent higher order thinking in more complex ways.

For example, Lewis and Smith (1993) assert that "higher order thinking occurs when a person takes new information and information stored in memory and interrelates and/or rearranges and extends this information to achieve a purpose or find possible answers in perplexing situations" (136). This is a broad and encompassing definition that includes problem

solving, critical thinking, creative thinking, and decision making (Lewis & Smith, 1993). Specifically, the skills to “interrelate” and “rearrange” are important in conceptualizing what defines higher order thinking. Further, Alexander et al. (2011) explain higher order thinking as “the mental engagement with ideas, objects, and situations in an analogical, elaborative, inductive, deductive, and otherwise transformational matter that is indicative of an orientation toward knowing as a complex, effortful, generative, evidence-seeking, and reflective enterprise” (53). The key point here is the *transformative* nature of thinking. When inquiries include the rearrangement, interrelationship, or transformation of content and information structures in conjunction with other funds of knowledge, higher order thinking unfolds.

In attempting to assess higher order thinking, the scholarship is vast and muddled. Generally, research (Lane, 2010) has shown that the format of the assessment can impact the types of thinking that are used by students. For example, in their guide *Assessing Higher Order Thinking Skills*, Arter and Salmon (1987) wrote that instruments using structured formats do not always measure higher order thinking as they often require one answer to be correct. In addition, these instruments are often focused on the answers rather than the process (Arter & Salmon, 1987). Similarly, Ennis (1993) claims that open-ended assessments are better to assess critical thinking skills than multiple-choice tests. Moreover, Lane (2010) argues that performance assessments are more suitable to assess high order thinking skills, compared to more restrictive test formats. Leighton (2011) explains performance assessments “better [elicit] and [measure] higher order thinking because they require real-life problem solving” (86). Examples of performance assessments are projects, portfolios, research papers, critiques, self-assessments, visual observations, and writing samples (Leighton, 2011). These many examples are linked by a handful of common features, namely they are multimodal and promote *student-driven inquiry* as a process.

Yet, studies measuring higher order thinking skills development in the context of MIL, are scarce. It is further unknown if skills in MIL would transfer to daily inquiries, as Martens (2010) argues. To embark on better understanding not only what students learn, but also how MIL learning impacts students’ inquiry processes, we flipped the script for assessment by inviting students to pose their own questions in response to an ICTs sample.

About the Study

Research Purpose

The purpose of this section is to contextualize our research in order to attend to the larger goal of our article, which is creating conversation regarding our findings as they relate to larger cross-literacy practices in cultivating inquiry. While numerous studies have attempted to measure MIL skills acquisition by examining students’ content knowledge (Arke and Primack,

2009; Hobbs and Frost, 2013) there are few studies that investigate the complexity of students' inquiries and thinking. The purpose of our research was to measure the complexity of students' questioning habits before and after their participation in a media literacy class. We were interested in whether MIL is effective for cultivating students' critical inquiry skills over time, specifically the level of complexity of their thinking.

In particular, our study evaluated growth in critical habits of inquiry by measuring changes in the questions students *themselves* posed about a media sample before and after a course in media literacy education. As explained in depth in Schilder and Redmond (2019), we examined changes in students' questions according not only to the funds of knowledge in media literacy key concepts represented by their inquiries, but also according to the complexity of the questions themselves. Our specific research questions for this aspect of the study were:

- (1) What is the complexity of students' questions about media before taking a media literacy course?
- (2) To what extent is there a difference in the complexity of the questions students ask before and after they take a media literacy course?

Research Design

The context of this study was two, semester-long, undergraduate media literacy courses offered at a large, public university located in the southeastern United States. One class was a media literacy class for pre-service teacher education students, while the second class was a media literacy class for a varied mix of communications-related majors (e.g., Electronic Media and Broadcasting, Advertising, Public Relations, Journalism, etc.). Participants comprised the seventy-two undergraduate students enrolled across multiple sections of these two classes. To engage participants in actually doing something, a requisite for inquiry, we employed a pretest-posttest experimental design that used an active viewing experience. In the pretest, the participants viewed a commercial media sample from the 2013 Super Bowl entitled *Busloads of kids get surprise trip to Toys R Us* (Heine, 2013). Participants were prompted with the following invitation: "Please watch the media provided. While you are watching, analyze the media. What questions come to mind while you watch this media? List your questions here. You can list as many or as few questions as you feel are necessary. Please number your questions." Following their viewing of the commercial, participants then listed the questions that came to mind, representing their inquiries. We enacted this pretest before and after a semester-long course in media literacy. The final data pool included 704 combined pre-and-posttest questions. Students contributed 328 questions in the pretest and 376 questions in the posttest.

Developing a Framework for Complexity

In building thoughtfully on the work of relevant scholarship, we leveraged key ideas from Biggs and Collis' (1982) SOLO Taxonomy as a framework for evaluating complexity in our study. An acronym for the Structure of Observed Learning Outcomes, Biggs and Collis' (1982) SOLO Taxonomy was initially designed to organize student learning outcomes in terms of quality. As shown in Table 1, from Rickles, et al. (2013), the SOLO Taxonomy uses five hierarchical levels to classify learning outcomes: (1) prestructural, (2) unistructural, (3) multistructural, (4) relational, and (5) extended abstract.

- | |
|--|
| <ol style="list-style-type: none"> 1. Prestructural: No understanding is demonstrated; response either restates question or does not answer the question. 2. Unistructural: Limited understanding; response focuses on one item. 3. Multistructural: Understanding of several discrete components is demonstrated; response includes several different, unrelated items in the exercise. 4. Relational: Understanding is demonstrated of several components that are conceptually integrated into the answer; response is appropriate to the scale of the question and prioritizes information. 5. Extended abstract: Understanding is demonstrated at a level beyond what is asked for in the question; response generalizes beyond the scope of the question. |
|--|

Table 1. Structure of Observed Learning Outcomes (SOLO) Taxonomy, From Rickles, et al. (2013).

We judged the level of complexity of students' questions using an adaptation of the SOLO Taxonomy, similarly including five levels. Yet, instead of a focus on sorting learning outcomes, our framework remixes key ideas from the SOLO Taxonomy in order to classify questions according to their increasing complexity as inquiry moves from lower order to higher order thinking (see Figure 1).

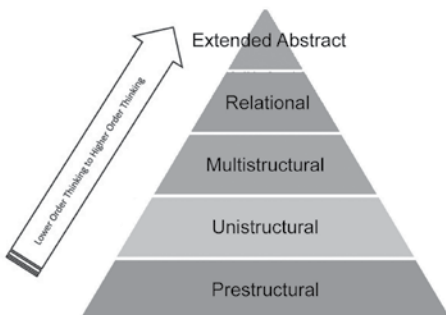


Figure 1. Remixed adaptation of SOLO taxonomy for evaluating higher order inquiry.

Our adaption is articulated fully in our complexity codebook that is provided in the Appendix. We recommend readers review the codebook as it includes detailed descriptions of each level in our inquiry hierarchy. To develop our codebook, we used the process described by DeCuir-Gunby, Marshall, and McCulloch (2011). Specifically, we articulated three basic dimensions for each area, including: (1) code name, (2) definition, and (3) example questions. In addition to providing the full codebook in Appendix, we offer sample descriptions for each level here.

The lowest level (not critical) inquiries were unclear questions that reflected misconceptions about the constructedness of the media messages. Examples of these questions included:

- Would you use this as a commercial?
- Is this a worthy cause in your eyes?
- Who has a computer or phone they play with at home? Why or why not?

These questions do not directly address the media sample and do not demonstrate active, critical inquiry. Generally, these questions were only distantly related to the media sample or task.

Questions rated as lower order questions focused on only one piece of basic or fixed information that could easily be identified in the media text. Examples of these questions were:

- What was used to film this?
- Who were these children?
- What type of media is this?

To answer these sample questions, one might simply recall, list, name, or describe some a readily identifiable aspect of the media sample, such as “video camera” in order to answer “What was used to film this?” These lower level questions do not require evidence to back up responses.

Higher order questions on the other hand, focused on breaking down ideas and analyzing relationships between media literacy concepts. Inquiries at the multistructural and relational levels demonstrated an ability to synthesize across funds of knowledge in media literacy learning and required evidence for the inquiry. For example, multistructural inquiries comprised:

- How did this clip make you feel?
- Where do you think these kids come from (economically)?
- Marketing wise, do you think this is a well put together commercial?

Multistructural questions demonstrated that the questioner was becoming an active negotiator of meaning, reasoning with information or analyzing content. But, these questions do not necessarily focus on relationships between ideas or require evidence. In contrast, relational questions generally require evidence from the media sample. Further, relational

questions focused on how disparate aspects were integrated into a complex, overall message.

Examples of relational inquiry included:

- Why do you think the producer chose to use such bright colors in this video? Some kids picked smaller toys than others, why?
- Why were they more excited about toys than about a nature park?
- The highest level, or extended abstract questions, focused on extending ideas and information into other domains or contexts in new ways—connecting, synthesizing, and transforming. Examples of advanced inquiry encompassed:
- What messages does this video send about American ideals? How does this video portray science in schools?
- Why did they show the girl talking about the princesses?
- Why did they begin with nature education and end with consumerism?

Questions in this category demonstrated the questioner's ability to take an aspect of the media sample and connect it beyond the sample to issues or ideas in the world, such as the portrayal of science, the role of media in shaping gender identity, and ideologies of consumption versus education.

With an established codebook, we needed to test for validity by establishing a strong interrater reliability. Interrater reliability measures to what extent different coders agree with each other. Because it is important that coders reach consensus, we used Krippendorff's alpha coefficient (Krippendorff, 2004) to measure the level of agreement. The interrater reliability for complexity between the two coders was 0.811 (Krippendorff's alpha coefficient). Krippendorff (2004) stated that a score of at least 0.8 is required as an indicator of good interrater reliability, so our rating provided an acceptable score. Additional precautions were taken in order to attend to validity and preserve the integrity of our data (Schilder & Redmond, 2019) including: providing students with no limits in viewing the ICT sample and responding to the survey and inviting external expert researchers to comment on codebook developments and processes.

Findings

To compare the complexity of the students' inquiries before and after taking a media literacy course, we conducted paired sample t-tests. We found that students asked significantly more complex questions after taking the media literacy course ($M = 2.17$, $SD = 0.86$) compared to before taking the course ($M = 1.94$, $SD = 0.91$), $t(71) = -2.01$, $p = 0.05$ (Schilder & Redmond, 2019). Figure 2 shows the amount of questions students asked for each level of complexity before and after the course. When looking at questions at the relational level, it is worth noticing the considerable increase (from 63 in the pretest to 140 in the posttest).

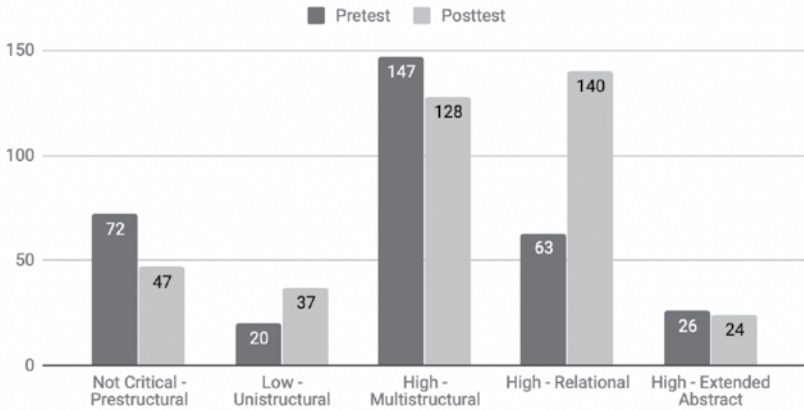


Figure 2: The level of complexity of student questions before and after course.

Our findings suggest that course work in MIL increases the depth and complexity of the questions students ask about media and information they encounter (Schilder & Redmond, 2019). In particular, our finding that students asked more *relational questions* is significant. By demonstrating an increased ability to inquire as to how concepts are connected to each other— such as the influence of media production techniques on the audience interpretation of the media message— students reveal enhanced capacities for synthesis, interrelating ideas, and transforming knowledge funds.

For instance, consider the following question: “Why do you think the music started playing when it did?” This question addresses the areas of *production techniques* and *message purpose*, synthesizing a complex relationship between motivations and media constructed-ness. Another question to consider is: “Why go this surprise route instead of simply filming in the store?” In this question, the student thought about the active choices that were made in crafting the overall narrative of the story. Or, finally, consider: “What types of emotions do you think this advertisement was trying to evoke among its viewers?” In this question, the student relates the concepts of *message purpose* and *audience emotion*. Together, these sample questions illustrate how relational thinking works to invite students to not only identify key concepts or knowledge in MIL, but also to break down information, analyzing to determine relationships. These questions focus on one or more dimensions or aspects as conceptually integrated in complex ways that can be lost without MIL training. Relational thinking is a higher order, critical thinking capacity and, when applied through-out MIL learning, it helps people become *more* active agents when interacting with tools and technology.

Discussion

Assessing multiliteracies continues to be a challenge. Many assessments tend towards a black-and-white or binary vision of learning that evaluates skills in a narrow way, usually by prompting students to respond to a series of yes/no and multiple-choice questions that are predetermined by an instructor or testing agency. However, MIL is not limited to developing skills to identify web addresses, authorship, authority, currency, relevance, or other singular information. Instead, MIL involves a complex and multifaceted process of analysis and evaluation that requires advanced, higher order thinking skills of multimodal media *blended across all forms*, including combinations of hyperlinked text and audio-visual material. Responding to questions provided on checklists may facilitate students' critical thinking in a superficial way— and some students may even internalize key themes using these methods. Yet, heavy reliance on exterior tools may draw attention away from a focus on fostering students' critical inquiry abilities as habits of mind and thwart the long-term preparation required for complete literacy in an unknown mediated future. Our research shows that the ability to see relationships between media literacy concepts is vital in learning to think in complex, higher order, and critical ways. In this way, education that incorporates MIL can help people become active agents in an age of changing, complex ICTs. Ultimately, this empowers people to critically analyze and evaluate media messages at a deeper level, which is at the heart of literacy education (Schilder & Redmond, 2019).

As a result of our research into the problems of assessment in multiliteracies, we must reject the notions that information is primarily alphabetic text and that fact-checking frameworks are enough to combat misinformation or cultivate MIL. As professionals in the fields of instructional design, librarianship, and media literacy, we recommend MIL as both a field of study and as an active practice that moves beyond the checklist to effectively develop relational thinking and habits of mind to fully examine the nuanced and interconnected constitution of ICTs. Specifically, we learned that relational inquiry may be enhanced when students have the opportunity to engage in learning across areas, such as media literacy and information literacy. In considering the intersectionality of our professional identities as they converge in the broader concept of *literacy*, we ultimately recommend ten areas across our fields of expertise that may be needed for complete MIL education in the twenty-first century. We recommend these areas as a starting place for the cultivation of inquiry across fields and suggest that they may further prepare and empower students for relational thinking. These areas are: purpose; authority; aesthetics and production; form and modality; economics; ideology and privilege; credibility; context; accessibility; and identity and audience (see Figure 3).



Figure 3. Areas of knowledge for remix in cultivating relational inquiry in MIL.

Further, in the spirit of inquiry that lies at the heart of the many literacies discussed in this article, we augment each area with corresponding questions:

1. Purpose – what is the author’s purpose for creating the resource/media? What is my purpose in accessing the resource/media? How does purpose shape the content of the resource/media and my interaction with it?
2. Authority – who is the author of the resource/media? What are their credentials? What is my role in questioning the author or contributing to meaning making when accessing the resource/media?
3. Aesthetics and Production - what are the aesthetic qualities of the resource/media? How do we define quality? How do aesthetics or production techniques contribute to the positioning of characters or information in the resource/media, and why?
4. Form and Modality – what is the form or modality of the resource/media? How does the form or modality shape who accesses the resource/media? How does the form or modality impact the content or message?
5. Economics – what is to be gained by the creation and dissemination of the resource/media? What economic advantages are initiated, how, and for whom?
6. Ideology and Privilege – what social, cultural, and political aspects or norms permeate the resource/media? What underlying hegemonies or histories contribute to the resource/media? Who is positively positioned or negatively positioned (or “othered”) by the resource/media?
7. Credibility – was the resource/media created by a credible entity? How do we know and how do we define “credible?”

8. Context – when/where was the resource/media created? How was it disseminated or shared? What was the political or social climate? How do larger contexts of creation, dissemination, sharing, and access by audiences impact the information?
9. Accessibility – how is the resource/media accessed? Is the resource/media accessible to the intended audience, as well as to others? Is it ADA compliant ?
10. Identity and Audience – who is the target audience for this resource/media? How do I know? What aspects of the resource/media suggest who is invited or omitted from understanding and engagement? How does the resource/media make me feel or make me want to do?

By engaging students in thinking critically *across these areas* (and others, as they emerge), we may more fully prepare them for the complexities of an unknown future, and for the continual stream of information and the inevitability of technological advances. We argue that fostering critical thinking requires the cultivation of relational inquiry. By engaging students in remixing, interrelating, interrogating, and transforming across these areas, we may more effectively prepare students to be critical consumers, creators, and evaluators of media and information in all forms.

Conclusion and Future Directions

All types of literacy are entangled and to limit our conceptualizations to scholarly fields of practice is to limit our ability to combat misinformation. As David Buckingham (2009) urges,

...there is a need to sharpen our arguments and focus our energies. There is a risk of [multiliteracies] being dispersed in a haze of digital technological rhetoric. There is a danger of it becoming far too vague and generalised and poorly defined— a matter of good intentions and warm feelings, but very little actually getting done. We can end up with lots of networking and dialogue, but no actual substance— a great deal of participation, but little action, and no significant change. (9)

We are in the business of creating lifelong learners who are well-equipped to navigate the multimodal world in which we now live. Through shared conversation, scholarship, and practice across the many fields of literacy in the twenty-first century, we might better attend to this goal of developing students' strong sense critical thinking skills, such as relational inquiry. If we are to truly embrace the idea of multiliteracies, we must also embrace the multidisciplinary nature of learning and inquiry, and that means that we must engage beyond and across the silos of our individual fields of study.

References

- Alexander, P. A., Dinsmore, D. L., Fox, E., Grossnickle, E. M., Loughlin, S. M., Maggioni, L., & Winters, F. I., 2011. Higher order thinking and knowledge: Domain-general and domain specific trends and future directions. In Shraw, G. & Robinson, D. H., Eds., *Assessment of higher order thinking skill*, Austin, TX: Information Age Publishing, Inc., 47-88
- Arke, E. T., & Primack, B. A., 2009. Quantifying media literacy: Development, reliability, and validity of a new measure. *Educational Media International*, 46(1), 53-56.
- Arter, J. A., & Salmon, J. R., 1987. *Assessing higher order thinking skills: A consumer's guide*. Portland, OR: Northwest Regional Educational Laboratory. Association of College and Research Libraries, 2011. *ACRL Visual Literacy Competency Standards for Higher Education*. <http://www.ala.org/acrl/standards/visualliteracy>
- Association of College and Research Libraries, 2016. Framework for information literacy for higher education. <http://www.ala.org/acrl/standards/ilframework>
- Behrens, S. J., 1994. A conceptual analysis and historical overview of information literacy, *College and Research Libraries*, 55(4), 309-322.
- Biggs, J. B., & Collis, K. F., 1982. *Evaluating the quality of learning: The SOLO taxonomy (Structure of the Observed Learning Outcome)*. New York, NY: Academic Press.
- Blakeslee, S., 2004. "The CRAAP Test", *LOEX Quarterly*, 31(3). <https://commons.emich.edu/loexquarterly/vol31/iss3/4>
- Bloom, B. S. (Ed.), Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D.R., 1956. *Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain*. New York, NY: David McKay.
- Bowen, T., 2017. Assessing visual literacy: a case study of developing a rubric for identifying and applying criteria to undergraduate student learning. *Teaching in Higher Education*, 22(6), 705-719.
- Buckingham, D., 2009. The future of media literacy in the digital age: Some challenges for policy and practice. https://www.researchgate.net/publication/265155209_THE_FUTURE_OF_MEDIA_LITERACY_IN_THE_DIGITAL_AGE_SOME_CHALLENGES_FOR_POLICY_AND_PRACTICE
- Callow, J., 2008. Show me: Principles for assessing students' visual literacy. *The Reading Teacher*, 61(8), 616-626.
- Casey, N. & Brayton, S., 2018. Media and information literacy: Growth through collaborative pedagogy. *The Journal of Media Literacy*, 65(1&2), 30-35.
- Casey, N. & Brayton, S., 2019. Reflections on adopting a critical media and information literacy pedagogy. In Pashia, A. and Critten, J., Eds, *Critical Approaches to Credit-Bearing*

- Information Literacy Courses*. Chicago, IL: The Association of College and Research Libraries (ACRL), 117-137.
- DeCuir-Gunby, J. T., Marshall, P. L., & McCulloch, A. W., 2011. Developing and using a codebook for the analysis of interview data: An example from a professional development research project. *Field methods*, 23(2), 136-155.
- Duncan, B., D'Ippolito, J., Macpherson, C., & Wilson, C., 1998. *Mass media and popular culture*. Toronto, ON: Harcourt.
- EAVI, 2011. Testing and refining criteria to assess media literacy levels in Europe. https://eavi.eu/wp-content/uploads/2017/08/study_testing_and_refining_ml_levels_in_europe.pdf
- Ennis, R. H., 1993. Critical thinking assessment. *Theory into Practice*, 32(3), 179-186.
- Evaluating information: The cornerstone of civic online reasoning*, 2016. Stanford History Education Group. <https://stacks.stanford.edu/file/druid:fv751yt5934/SHEG%20Evaluating%20Information%20Online.pdf>
- Felten, P., 2008. Visual literacy, *Change: The Magazine of Higher Learning*, 40(6), 60-64.
- Freire, P., 1970. *Pedagogy of the oppressed*. New York, NY: Herder and Herder.
- Gross, M., & Latham, D., 2012. What's skill got to do with it?: Information literacy skills and self-views of ability among first-year college students. *Journal of the American Society for Information Science and Technology*, 63(3), 574-583.
- Hartai, L., 2014. *Report on Formal Media Education in Europe*. (WP3). <https://eavi.eu/wp-content/uploads/2017/02/Media-Education-in-European-Schools-2.pdf>
- Heine, C., 2013, October 21. *Toys R Us' holiday ads employ prankvertising element of surprise at center of huge effort*. <http://www.adweek.com/news/>
- Hobbs, R., 1998. The seven great debates in the media literacy movement. *Journal of Communication*, 48(2), 9-29.
- Hobbs, R., & Frost, R., 2003. Measuring the acquisition of media literacy skills. *Reading Research Quarterly*, 38, 330-356.
- Jacobson, L., 2017. Assessing news literacy in the 21st century: A year after the election that blurred lines. *Literacy Today*, 35(3), 18-22.
- Krippendorff, K., 2004. *Content analysis: An introduction to its methodology* (2nd Edition). Thousand Oaks CA: Sage.
- Lane, S., 2010. Performance assessment: *The state of the art*. (SCOPE Student Performance Assessment Series). Stanford, CA: Stanford University, Stanford Center for Opportunity Policy in Education.
- Lealand, G., 2009. A success story: Media teaching in New Zealand. In Cheung, C. K., Ed, *Media Education in Asia*. Dordrecht, the Netherlands: Springer. 19-30.

- Leighton, J. P., 2011. A cognitive model for the assessment of higher order thinking in students. In Shraw G. & D. H., Eds, *Assessment of higher order thinking skills* Austin, Texas: Information Age Publishing, Inc., 151-184.
- Lewis, A., & Smith, D., 1993. Defining higher order thinking. *Theory into Practice*, 32(3), 131-137.
- Mandalios, J., 2013. RADAR: An approach for helping students evaluate Internet sources. *Journal of Information Science*. 39. 470-478.
- Martens, H. (2010). Evaluating media literacy education: Concepts, theories and future directions. *Journal of Media Literacy Education*, 2, 1-22.
- Masterman, L., 1985. *Teaching the media*. London: Comedia.
- Metros, S. E., 2008. The educator's role in preparing visually literate learners, *Theory Into Practice*, 47(2), 102-109,
- Moeller, S., Joseph, A., Lau, J., & Carbo, T., 2011. Towards media and information literacy indicators. United Nations Educational, Scientific and Cultural Organization. Paris, France. <https://www.ifla.org/publications/towards-media-and-information-literacy-indicators>
- National Association for Media Literacy Education Association (2007). Core principles of media literacy education in the United States. <http://namle.net/wp-content/uploads/2009/09/NAMLE-CPMLE-w-questions2.pdf>
- National Association for Media Literacy Education (NAMLE). (2014). *Key questions to ask when analyzing media messages*. <https://drive.google.com/file/d/0B8j2T8jHrlgCZ2Zta2hvWkF0dG8/view>
- National Association for Media Literacy Education (NAMLE). (n.d.) Media literacy defined. <https://namle.net/publications/media-literacy-definitions/>
- News Literacy Project. (n.d.) News lit quiz: real or not? Retrieved from <https://newslit.org/get-smart/which-is-legit/>
- Rhodes, J. A., & Robnolt, V. J., 2009. Digital literacies in the classroom. In Christenbury, L., Bomer, R. & Smagorinsky, P., Eds, *Handbook of adolescent literacy research*. New York: The Guilford Press, 153-169.
- Rickles, M. L., Schneider, R. Z., Slusser, S. R., Williams, D. M., and Zipp, J. F., 2013. Assessing change in student critical thinking for introduction to sociology classes. *Teaching Sociology*, 41(3), 271-281.
- Rogow, F., 2011. Ask, don't tell: Pedagogy for media literacy education in the next decade. *Journal of Media Literacy Education*, 3(1), 16-22.
- Schilder, E. A. M., 2013. Theoretical underpinnings of media literacy from communication and learning theory. *VASA Journal on Images and Culture (VJIC)*, No. 2. April. http://vjic.org/?page_id=666.

- Schilder, E. and Redmond, T., 2019. Measuring Media Literacy Inquiry in Higher Education: Innovation in Assessment. *Journal of Media Literacy Education*, 11(2), 95 -121
- SchoolJournalism.org., 2019. Six principles of news literacy. Retrieved from <https://www.schooljournalism.org/news-literacy-overview/>
- Thoman, E., 1993. Skills and strategies for media education. <http://www.medialit.org/reading-room/skills-strategies-media-education>.
- Thompson, D. S., 2018. Visual literacy, news literacy, and the fight against misinformation. *Journal of New Librarianship*, 3, 381-386.
- United Nations Educational, Scientific and Cultural Organization, 2013. *Global media and information literacy assessment framework: Country readiness and competencies*. Paris, France. <http://unesdoc.unesco.org/images/0022/002246/224655e.pdf>
- Victoria Curriculum and Assessment Authority, 2011. VCE media assessment handbook 2012 - 2016. <http://www.vcaa.vic.edu.au/Documents/vce/media/MediaHbook 2012-2016.doc>