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ABSTRACT

Even though media literacy education has grown in the United States and around the world, policymakers still lack knowledge about the scope and depth of implementation of media literacy learning activities in the elementary and secondary grades. This study reports how the Media Literacy Implementation Index (MLI) was developed and validated using a quota sample of stakeholders from across all school districts and local communities in Rhode Island. Using an established theoretical framework for media literacy, we first constructed a scale to examine the likelihood that learners may encounter a set of media literacy learning activities. Multiple methods were then used to assess reliability and validity of the instrument including cognitive pretesting, think aloud protocols, a content validation of MLI learning activities in relation to national education standards documents, and statistical validation including principal components analysis to assess internal consistency, reliability, and validity. An easy-to-implement measure of the scope and depth of media literacy education in elementary and secondary schools will be useful to diverse stakeholders including educators, school leaders, librarians, parents, community members, and elected public officials.

Introduction

Although children and teens are in near constant contact with the internet, digital inequalities are shaping how they experience and understand the world and their place in it. These inequalities go far beyond merely access to and proficiency with technologies. The knowledge, skills, and competencies that include accessing information and evaluating its quality, recognizing stereotypes in media representations, being responsible message creators and consumers, and understanding the political, social, and economic contexts in which media messages influence individuals and societies are, collectively, what are

defined as media literacy (Bulger & Davison, 2018). But these foundational competencies of media literacy are not yet consistently part of American public education.

The scholarly and professional literature on media literacy education has developed significantly over the past 20 years, building upon efforts by stakeholders in local communities and with support from a variety of government, philanthropic, business, and education partnerships. Scholarly knowledge on media literacy education has advanced theoretically and pragmatically by educators, scholars, media professionals, and activists from around the world (Hobbs et al., 2019). Since the rise of the so-called fake news crisis in 2016, media literacy education has been identified to enhance the information capacity of individuals, particularly in relation to citizenship and learning (Buckingham, 2019).

Locally, media literacy education takes different forms in different educational contexts. In some schools, the practice of media literacy education is sometimes offered to students as a stand-alone subject, especially in the secondary grades. In other cases, it is integrated into courses in literature and language studies, social studies, science, or health education (Weninger, 2018). Students may get introduced to media literacy concepts as part of classroom instruction or through summer school or afterschool programs (Tiemann et al., 2021).

Generally, the implementation of media literacy education programs in local communities is largely contingent upon the interests, experience, knowledge, and talents of educators and school leaders. Teachers' understanding of media literacy is impacted by the content or subject area they teach (Deal et al., 2010) and their exposure to professional development training (Scull & Kupersmidt, 2011). Researchers have found substantial disparities in teacher understanding, with some teachers possessing an in-depth understanding and others being completely unaware of the term (Hattani, 2019). Indeed, many teachers see media literacy education as exclusively focusing on the critical evaluation of media messages but do not appreciate that media literacy education includes pedagogical strategies that engage students in creative expression, where students develop confidence in self-expression or explore the power of communication for civic engagement (Weninger et al., 2017).

Some states have made substantial investment in professional learning in media literacy. In states including California and Washington and others, legislative action has been taken to help media literacy education gain a foothold in public schools (Stowell, 2018). In Illinois, a state law now mandates that a unit of media literacy be taught to all high school students (Media Literacy Now, 2021). In Rhode Island, there was a statewide campaign to provide professional development in media literacy education to school and public librarians in a collaboration between the University of Rhode Island and State Office of Library and Information Service (OLIS) with support from the U.S. Institute of

Museum and Library Studies (IMLS). The program included the provision of digital badges as school librarians attended workshops and learned about animation, film literacy, and other topics (Moen, 2020).

Researchers have not yet developed assessments to help gauge the prevalence of media literacy education in schools to determine the likelihood that educators are addressing the key concepts, core principles, and instructional practices. As a result, we know very little about how, how often, why, or when media literacy learning activities are implemented in American elementary and secondary schools. Without a clear picture of the situation locally, regionally, or nationally, policy leaders lack information on which to make decisions. To address this problem, we developed and validated the Media Literacy Implementation Index (MLI) to assess the scope and depth of implementation of media literacy learning activities in schools. Collecting information from diverse stakeholders in every school district and community in Rhode Island, we demonstrate the potential value of a statewide measure of media literacy implementation as a tool for research, policy, advocacy, and curricular innovation.

Literature review

Media literacy has been conceptualized in relation to a variety of theoretical positions in the disciplines of communication, media studies, and education. Educational researchers may theoretically connect media literacy education to a variety of foundational themes, including constructivism, constructionism, literacy, project-based learning, career and technical education, and educational technology (Weninger, 2018). Because schools have an obligation to prepare learners for life, work, and citizenship, there is growing interest in expanding the concept of literacy to include multimodal, digital, and popular culture forms of expression and communication in English language arts education (Lysicott et al., 2021). Studies have shown that educators need knowledge, confidence, and an understanding of media literacy instructional practices to implement them in the classroom (McNelly & Harvey, 2021).

Communication scholars working in the rhetorical tradition also value media literacy education for its focus on critical analysis, including recognition of the purpose, content, structure, and constructed nature of media representation. In the critical cultural studies tradition, media literacy education is conceptualized as one way in which the active audience may function to counter the hegemonic power of mass media (Hobbs, 2019). Within the field of media effects, media literacy education is often identified as an intervention designed to counter the negative effects of mass media messages on attitudes, behaviors, and values (Jeong et al., 2012). Although scholars have measured media literacy competencies in different ways through both self-report measures and performance

tasks, they acknowledge the challenging nature of this work, noting especially that the activation of media literacy competencies is multifaceted, contextual, and situational (Schilder et al., 2016; Wuyckens et al., 2021).

Self-report and performance measures of media literacy competencies

Self-report measures of media literacy predominate in the scholarly literature. The Smoking Media Literacy scale (Primack et al., 2006) has been shown to be a reliable and valid instrument for research purposes when the goal is exploratory research to examine relationships between variables (Arke & Primack, 2009). In the domain of news and journalism, researchers have developed a news media literacy scale that includes self-report items. College students are asked to rate their level of agreement with statements such as "The owner of a media company influences the content that is produced," "People are influenced by news whether they realize it or not," or "A journalist's first obligation is to the truth." But researchers recognize the limitation of self-report measures, observing that some respondents may have recognized and offered the researchers the expected or "right" answers (Ashley et al., 2013)

Performance tasks address some of the limitations of self-report measures because they demand the demonstration of media literacy competencies through the completion of an activity. Media literacy performance tasks ask subjects to demonstrate their media analysis skills through responding to texts in different format and genres, including print newsmagazine stories, audio/radio news, and print advertisements. (Hobbs & Frost, 2003). More recently, at the height of the so-called fake news crisis, McGrew et al. (2018) created a range of performance tasks that assess students' civic online reasoning – a type of media literacy that emphasizes the ability to effectively search for, evaluate, and verify social and political information online. In testing middle school, high school, and college students, they found that hardly anyone could perform to expected standards in evaluating online claims, sources, and evidence. Pereira and Moura (2022) acknowledge that in Europe and elsewhere, policymakers are asking researchers to develop measures of evaluate and compare media literacy competencies across different cultural contexts. They conducted a study of the media literacy competencies of Portuguese teenagers using both self-report and performance measures and acknowledged the context and subject-dependent nature of the practice. Educators value performance tasks because they can be applied flexibly in response to learners' actual use of media texts, tools, and technologies, but they can also be labor intensive to score and difficult to use with large samples (Ptaszek, 2019).

The practice literature in media literacy education is rich with case studies and teacher action research examples that demonstrate how the use of varied learning activities advance student learning. Case studies of media literacy education clearly reveals that exposure to certain instructional practices is

highly likely to lead to the acquisition of media literacy competencies. In one study, elementary school students who were taught to critically analyze advertising improved persuasion knowledge after only a few hours classroom instruction (Nelson, 2016). In another study, Grade 6 students in three towns shifted their attitudes about media violence after participating in critical discussions and analytical viewing exercises, and participation in the curriculum was associated with increased critical attitudes about media violence among learners (Scharrer, 2006).

Implementation measures

To measure exposure to media literacy education, researchers have sometimes used self-report measures, asking students directly about their educational experiences. Kahne and Bowyer (2019) asked students how often they had classes in school in which they "learned about how to create and share digital media" and "discussed how to effectively share your perspective on social or political issues online (for example, by blogging or tweeting)." In a study of porn media literacy, Vandenbosch and van Oosten (2017) asked Dutch students to indicate whether their classes on sexuality and relationships had included discussions of the use of sexually explicit images and movies.

Teachers have also been asked to identify barriers, obstacles, and other factors that impede the implementation of media literacy education (Kubey, 1998). More recent survey research has shown that public K-12 teachers identified a variety of obstacles to promoting and implementing media literacy. The litany of challenges typically includes too many other responsibilities, pressure to cover academic content, lack of training or professional development in media literacy, lack of instructional resources, lack of guidance on media literacy programs and curricula, and lack of guidance about how to integrate media literacy with existing classes (Baker et al., 2021).

Implementation measures are also sometimes used by public health researchers to better understand local successes and challenges in program evaluation. This approach emphasizes the value of producing results that are pragmatically useful and relevant to the people who will directly benefit from the information. In addressing the gap between research and practice, Glasgow and Riley (2013) note that many stakeholders in public health dissemination and implementation initiatives are not formally trained in the collection, analysis and use of standardized, quantitative measures. In other cases, the training requirements required for gathering data in a local community may require specialized education, be too lengthy, or have a time burden to administer, score, and interpret. To be effective, implementation measures should be inexpensive and easy to use. Experts recommend that data be collected from a range of sources

and combined into a single measure that can be used for outreach, communication, and advocacy (Hargreaves et al.,, 2016).

Philosophers of science note that successive but not necessarily convergent approximations of any phenomenon depend upon a dialectical relationship between theory and methodology, noting, "The approximate truth of current theories explains why our existing measurement procedures are (approximately) reliable" (Boyd, 1990, p. 362). For hyperlocal phenomenon, such as media literacy education in schools, a measure that engages multiple community stakeholders has value. Parents, teachers, school leaders, librarians, community members, and elected public officials all may have partial and incomplete insight on the implementation of media literacy education within their community. When their estimations are combined, the approximations may approach accuracy and offer a realistic explanation for the phenomenon of interest (Hobbs et al., in press). For these reasons, we sought to develop a measure of media literacy implementation in elementary and secondary schools, working with diverse stakeholders across a small state that includes rural, suburban, and urban populations.

Research methods

This research is a mixed-method study that explores the perceptions of key stakeholders regarding media literacy implementation in Rhode Island elementary and secondary schools. We created and validated the Media Literacy Implementation (MLI) Index, using multiple methods to assess reliability and validity of the instrument including cognitive pretesting, think aloud protocols, a content validation of MLI learning activities in relation to national education standards documents, and statistical validation including principal components analysis to assess internal consistency, reliability, and validity. We wanted to answer these research questions: (1) How likely are Rhode Island students to encounter 16 core learning activities of media literacy education? (2) Which obstacles and facilitating conditions are associated with media literacy implementation?

Sample. We used quota sampling to address our primary goal of getting a representative sample of participants from each of the 24 school districts in a small U.S. state. As this state includes urban, suburban, and rural areas, we wanted representation from every community in this study. From among the population of individuals residing or working in the state, we recruited participants who could be identified in one (or more) of these roles: (1) educator, (2) librarian, (3) school leader, (4) parent, (5) community member, and (6) elected public official. Quota sampling is a type of non-probability sampling that, although not representative of the target population, is practical and inexpensive. Inferences can be made from a non-probability sample when the risk of bias is controlled through assumptions that are used to build the model

(Cornesse et al., 2020). We used publicly available databases to recruit partici-pants and we encouraged participants to share the survey with individuals in their own network, thus deploying snowball sampling as a secondary strategy. We worked with a statewide legislative advocacy group that had access to diverse stakeholders, including school superintendents, librarians, parents, and elected officials who had helped to advocate for and pass initial media literacy education legislation in the state.

To ensure our sample was representative of the many school districts in the state, educators, school leaders and librarians were asked to identify the name of their school district while community members, elected public officials and parents were asked to identify the name of their community. We received 537 surveys from 24 school district communities and among these, there were 531 usable data records, with 379 records with geographi-cally specific location data, and 330 complete records which included data on all relevant items. We performed data analysis on all usable records without any use of data imputation or other statistical manipulation of incomplete data. The sample included 56% educators, 33% librarians, 7% school leaders, 25% parents, 32% community members, and 5% elected public officials. Results do not sum to 100% because participants could select more than one role.

Instrument Design. To develop the Media Literacy Implementation (MLI) scale, we first reviewed the extensive practitioner literature in elementary and sec-ondary education to identify the most common learning activities of media literacy. We applied a media literacy theoretical framework that defines media literacy as the ability to access, analyze, and create media in a wide variety of forms, using reflection and taking action to use the power of communication and information for social good (Hobbs, 2010). We constructed learning activi-ties that offer brief descriptions of how media literacy is being implemented in classrooms to help participants mentally visualize the learning in action. These learning activities are appropriate for use across subject areas including English language arts/literacy, social studies, the sciences, visual arts & design and the performing arts, library media, mathematics, engineering and technology, com-prehensive health, and world languages. We also measured the perception of obstacles and limitations to implementation by building on the work of pre-vious scholars (Hattani, 2019; Kubey, 1998).

Because the MLI learning activities are developmentally sensitive to the needs of children and teens of different ages, we selected four learning activities for elementary and middle-school students, and eight activities for high school students, for a total of 16 items, as shown in Table 1. The instrument asks participants to make inferential judgements about the scope of implementation in their community's school district. The question stem reads: "Read each item and estimate how many of the learners in your school or community have encountered any of these activities during this academic year. You may be unsure

Table 1. Media Literacy Implementation (MLI) Index.

Elementary School

Images and Advertising. Students interpret different types of advertising to examine how images can be manipulated and then they reflect on how advertising affects attitudes and behaviors.

Compare and Contrast. Students compare and contrast two different forms of media to identify similarities and differences in content, format, target audience, and point of view

Tell a Story. Students adapt a book into a media genre, including animation, video game, or video, creating a storyboard or a script to depict an imaginary world with characters, conflict, and a sequence of events.

How Media Messages Influence. Students identify the many different choices that creators make and consider how the design of media messages may influence people's thoughts, feelings, and beliefs.

Middle School

Stereotypes. Students analyze examples of different types of media to spot stereotypes and examine how values and ideologies are embedded in characters and stories.

Examine the News. Students determine the difference between a news story and an opinion story in print and broadcast journalism.

Team-Based Production. A small group of students work collaboratively to create a video and their work is viewed by parents, peers or the community.

Balancing Online and Offline Life. Students keep track of their media use over a period of time and discuss how media may be beneficial or harmful to their health, identity and relationships.

High School

Music & Cultural Values. Students explore music from different time periods to identify how it reflects social values and activates strong emotions in ways that build consensus on controversial political issues.

The Business of Media. Students learn about how advertising is targeted to increase its effectiveness and how selling audience attention is the way that media companies make money.

Research Project. Students learn how to generate questions and gather information from multiple sources to learn something new and then summarize what they learned by creating a written work, video, oral presentation, podcast, infographic or other media project.

Present a Strong Point of View. Students write an article or create a media presentation that advocates for or against a specific action, using reasoning and evidence to defend their point of view.

Create a Public Service Announcement. Students choose a topic and work collaboratively to create a public service campaign designed to raise awareness, promote a cause or an event, or motivate people to take action in the community.

Reflect on Your Interpretations. Students examine various information sources and notice how their own opinions and existing beliefs may influence their interpretation of what they see and read.

The Social Responsibilities of the Communicator. Students reflect on how they use both online and face-to-face expression and communication in their social relationships and learn how to reduce conflict and disrupt hurtful or aggressive talk and actions through dialogue and active listening.

Media Law and Policy. Students learn about the First Amendment and other laws that empower them as citizens in a democracy and apply social responsibility as both creators and consumers of media messages.

"How many of the students in your school or community have encountered each of these learning activities during the academic year?

(5) nearly all, (4) most, (3) some, (2) few, (1) hardly any.

whether these types of activities are occurring in your school or community. But your estimate is still important." After each learning activity is described, participants select from the following "nearly all," "most," "some," "few," or "hardly any."

To refine the items on this survey instrument, we used cognitive interviewing and think-aloud protocols, which have been demonstrated to help ensure that questionnaire design is optimized for comprehensibility (Padilla & Leighton, 2017). We asked six classroom teachers from our professional network to read aloud each item and offer an interpretation of its meaning. This process helped us to identify the items which were unclear and caused confusion and participants gave suggestions to improve the questionnaire; we revised the survey questions to clarify items based on the information gathered from cognitive pretesting.

Results

We first report the results of the content validation, followed by the statistical procedures we used to examine the reliability and validity of the research instruments.

Content validation

To test the content validity of the 16 learning activity items in the survey, we examined if and how each of the 16 items in the MLI scale were aligned to national standards in four K-12 content areas. Content validity refers to how well a survey or test measures the construct that it sets out to measure. We examined four national standards including those from the International Society for Technology in Education (ISTE, 2022), the American Association of School Librarians National School Library Standards (AASL, 2018), the Common Core State Standards (CCSS, 2010) for English Language Arts; and the National Standards for Media Arts (NSMA, 2014).

Two researchers independently compared each learning activity to each set of national standards and identified a standard that most closely aligned. As researchers compared their findings, they reached consensus through discussion, demonstrating that the use of multiple researchers to review findings increases the credibility of the conclusions (Patton, 2002). A small excerpt from the complete content validation document is shown as Table 2.

The results of the content validation indicated a high alignment between the media literacy implementation items and the content and curriculum standards of all four national standards across all grade levels. At the elementary level, all the MLI items aligned to at least one standard in each of the national content area standards. As a group, these items aligned to the ISTE Knowledge Constructor and Creative Communicator standards; the AASL Inquire and Include shared foundations; the Media Arts Standards of analyzing, interpreting and conveying meaning in artistic work; and the CCSS Reading and Writing standards around analyzing, evaluating and interpreting texts as well as the writing of narratives.

At the middle school level, we found that the four MLI items closely aligned to the ISTE Digital Citizen, Global Collaborator and Knowledge Constructor standards; the AASL Include, Collaborate, Explore and Engage shared foundations; the Media Arts standards on interpreting and conveying meaning in artistic work and CCSS Reading standards on point of view and interpretation of texts. All of the items aligned to at least one standard in the ISTE, AASL, Media Arts and CCSS content areas except for one, The Balancing Online and Offline Learning, which did not align to a Media Arts standard.

At the high school level, we found that all eight MLI items aligned to at least one standard in each content area. All items aligned with the ISTE Knowledge

Table 2. Examples of MLI Items Aligned with National Curriculum Standards.

MLI Items	ISTE Student Standards	AASL National School Library Standards	MEDIA ARTS National Arts Standards	CCSS for English Language Arts
Elementary School - Tell a Story. Students adapt a book into a media genre, including animation, video game, or video, creating a storyboard or a script to depict an imaginary world with characters, conflict, and a sequence of events.	1.6 Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.	B. Create I. Inquire: Generate products that illustrate learning.	Standard 6: Convey meaning through the presentation of artistic work.	CCRA.W.3 Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details and well-structured event sequences.
Middle School - Examine the News. Students determine the difference between a news story and an opinion story in print and broadcast journalism.	1.3 Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.	A. Think. II Include: Adopting a discerning stance toward points of view and opinions expressed in information resources and learning products.	Standard 8: Interpret intent and meaning in artistic work.	CCRA.R.6 Assess how point of view or purpose shapes the content and style of a text.
High School - Create a Public Service Announcement. Students choose a topic and work collaboratively to create a public service campaign designed to raise awareness, promote a cause or an event, or motivate people to take action in the community.	1.6 Creative Communicator Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.	A. Think. III. Collaborate: Developing new understandings through engagement in a learning group.	Standard 6: Convey meaning through the presentation of artistic work.	CCRA.SL.4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Constructor, Digital Citizen and Creative Communicator standards. For AASL, the items aligned with the Inquire, Include, Collaborate, Explore and Engage shared foundations. For Media Arts, the items aligned with the standards on analyzing, interpreting, and conveying meaning in artistic work as well as relating artistic ideas and works with societal, cultural, and historical context. For CCSS, the items as a group aligned with the research and argument writing standards, the standards on assessing point of view and evaluating different

formats, and the speaking and listening standards, including participating effectively in discussion and presentation skills. An appendix is available in the Supplemental Materials with the complete content validation for all items.

Statistical validation

Before performing exploratory factor analysis, we examined the suitability of the MLI scale data. Tests of normality found that values of skewness and kurtosis were lower than 1. Bartlett's test of sphericity was used to determine whether factor analysis would be appropriate for this data set. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.92, exceeding the recommended value of 0.60 and Barlett's Test of Sphericity was statistically significant ($\chi2 = 2661$, df = 314, $p < 0.01$), indicating highly acceptable factorability of the data. The sample size of the study was more than adequate because the number of cases from 100 to 400 can be regarded as suitable for factor analysis (Hair et al., 2013). Descriptive statistics of the MLI scale are shown in Table 3.

We then performed iterative principal components analysis (PCA) using varimax rotation with the 16 MLI items to determine the underlying factor structure produced by these items. The first iteration of PCA showed 4 factors with an eigenvalue over 1. We conducted a second PCA on the items that maintained a loading of at least 0.30 on 1 of the first 2 factors. The rotation converged in 6 iterations. This PCA resulted in a conclusive 4-factor solution with an eigenvalue of 3.9 explaining 24% of the variance. We used a cutoff factor loading of 0.30 to examine correlation among items that represented the grade bands associated with media literacy implementation. Table 4 shows how the 4

Table 3. Media Literacy Implementation (MLI) Index Descriptive Statistics.

	Mean	Std. Deviation
ELEMENTARY		
Compare and Contrast	2.81	1.186
Images and Advertising	2.54	1.099
Tell a Story	2.85	1.165
How Media Messages Influence	2.59	1.139
MIDDLE SCHOOL		
Analyze News	3.07	1.013
Balance Online Offline	2.60	1.015
Team Production	2.96	1.031
Stereotypes	2.87	1.001
HIGH SCHOOL		
Research Project	3.88	0.983
Interpretations	3.13	1.019
Music Values	2.85	0.994
Social Responsibilities	3.05	1.026
Create a PSA	2.65	0.986
Present a Strong POV	3.38	1.025
Business of Advertising	2.69	0.896
Media Law and Policy	2.79	0.996
N = 330		

Table 4. Principal Components Analysis, MLI Index.

	Component			
	1	2	3	4
ELEMENTARY LEVEL				
Compare and Contrast				0.631
Images and Advertising				0.799
Tell a Story		0.391		0.318
How Media Messages Influence				0.761
MIDDLE SCHOOL				
Analyze News		0.554		
Balance Online Offline		0.722		
Team Production		0.441		
Stereotypes		0.726		
HIGH SCHOOL				
Research Project			0.747	
Interpretations			0.649	
Music Values	0.318		0.52	
Social Responsibilities			0.657	
Create a PSA	0.694			
Present a Strong POV	0.532		0.319	
Business of Advertising	0.723			
Media Law and Policy	0.727			

factors converged on the grade bands, with factors 1 representing activities more common to high school social studies classrooms and 3 representing those learning activities more associated with high school English language arts classrooms. Component 2 represents middle school activities and component 4 represents elementary school activities. One item intended as an elementary activity (Tell a Story) is more strongly identified as aligned with middle-school level activities.

The final 16-item MLI scale has excellent internal consistency, with a Cronbach α = 0.91.

For ease of intuitive interpretation and potential future practical application, we converted the 16-point scale into 3 equivalent subscales. We created elementary and middle school MLI subscales by summing the four items in each grade band, with elementary MLI scores (M = 10.76, SD = 3.71, N = 365) and middle school MLI scores (M = 11.43, SD = 3.24, N = 346) To create equivalence, for the high school MLI, we summed eight items and divided to create a score that also ranged from 4 to 20, high school MLI (M = 12.24, SD = 2.90, N = 326).

The MLI scale was created to represent the sum of the 3 subscales (M = 20.14, SD = 18.23, N = 531), with a range of 12–60.

In the next stage of validation, principal components analysis (PCA) using Varimax rotation with Kaiser normalization was used to analyze the 19 obstacles and limitations (OL) scale. All items have a standardized range as these variables are scored dichotomously and analysis was performed on 526 records. After constructing a covariance matrix, we calculated eigenvalues from the covariance matrix to determine the principal components of the data. In principal components analysis, new variables are identified as linear combinations or mixtures of the initial variables. Scree plots revealed that 6 components had

an eigenvalue of 1 or greater, accounting for 56% of the total variance. Rotation converged in 10 rotations. Table 5 shows the Principal Components Analysis for MLI Obstacles and Limitations (OL). Using the results shown, we refined the scale to identify and group items. We eliminated one item, Limitations of Space in the School, which did not fit well into the typology suggested by the factor analysis. The final six OL factors are shown in Table 6.

The factors extracted from the factor analysis were used for reliability testing. All variables were categorized into their appropriate subscales, and reliability analyses were conducted. All items had dichotomous response scales, so Cronbach α was used with listwise deletion based on all variables in the procedure. Cronbach α of .87 demonstrates that the obstacles and limitations (OL) scale has high reliability. Table 7 reports descriptive statistics for the MLI Obstacles and Limitations (OL) scale. Examination of subscales shows that the highest subsets of obstacles and limitations scale include academic priorities, mentioned by 37% of participants (M = .37, SD = .39), technology access, mentioned by 33% of participants (M = .33, SD = .34, and student readiness (M = .20, SD = .24). The lowest subsets of obstacles and limitation include school policies, mentioned by only 16% of participants (M = .37, SD = .39, n = 536), educators, mentioned by 18% of participants (M = .18, SD = .22), and community (M = .18, SD = .27). In its current form, the obstacles and limitation (OL) score has a policy communication advantage because it is represented as a dichotomous variable. This makes it easy to convert to a percentage, which helps lay audiences understand which obstacles and limitations are most likely to affect implementation. In another study, we examine the relationship between variables through hypothesis testing and regression analysis to determine how sociodemographic characteristics of the 24 school districts may influence implementation (Hobbs et al., in press).

Table 5. Principal Components Analysis for MLI Obstacles and Limitations (OL).

	Component					
	1	2	3	4	5	6
Wireless connectivity in the school	0.696					
Access to digital devices	0.682					
Wireless connectivity in the home	0.657					
Students lack basic skills and knowledge	0.597	0.308				
Focus on test scores in reading and math	0.554					0.305
Students lack interest	0.486				0.466	
Not sure where it fits in school curriculum	0.361					
Limits in educator knowledge, experience, or know-how		0.621				
No perceived need to change the curriculum		0.61				
Lack of interest in the community	0.331	0.415	−0.349			0.353
Students are too young or not mature enough			0.806			
Students not emotionally ready			0.774			
Concerns about controversy in community response				0.791		
Resistance from the community		0.315		0.744		
School policies regarding the use of film and video					0.722	
School policies regarding digital devices like mobile phones					0.655	
Limitations of space in the school				0.325		0.609
Educators and teaching staff are reluctant		0.413				−0.546
Other priorities are more urgent	0.481					0.526

Table 6. Final Factor Structure of the MLI Obstacles and Limitations (OL) Scale.

Technology
- Wireless connectivity in the school
- Access to digital devices
- Wireless connectivity in the home

Perceptions of Students
- Students lack basic skills and knowledge
- Students lack interest
- Students not emotionally ready
- Students are too young or not mature enough

Academic Priorities
- Focus on test scores in reading and math
- Other priorities more urgent

Community Response
- Concerns about controversy in community response
- Resistance from the community
- Lack of interest in the community

Educators
- Limits in educator knowledge, experience, or know-how
- No perceived need to change the curriculum
- Educators and teaching staff are reluctant
- Not sure where it fits in the curriculum

Policies
- School policies regarding film and video
- School policies regarding digital devices like mobile phones

Table 7. Descriptive Statistics for the MLI Obstacles and Limitations (OL) Scale.

	Mean	Standard Error	Std. Deviation
Community	0.18	0.01	0.2753
Educators	0.18	0.01	0.22084
Tech	0.33	0.02	0.34696
Students	0.20	0.01	0.24043
Academic Priorities	0.37	0.02	0.39355
Policies	0.16	0.01	0.2817
N = 536			

Developing a community report card in media literacy

The presentation of data for advocacy purposes is different than for theory building. When implementation measures are designed for pragmatic use in the community, sensitivity to community engagement is important. Researchers make choices in the data analysis process to report results: they can emphasize deficits or celebrate strengths.

While mean scores enable researchers to report the overall level of media literacy implementation across the state, our community partner and local constituents insisted that we depict each of the 16 learning activities to indicate estimates in a much simpler form. As a result, we reported percentage scores where "nearly all" or "most" learners had exposure to media literacy learning activities. By choosing to report percentages using a positive framing of the results, we showcased learning activities that are already common in school districts; we anticipated that this would be useful inspiration for teachers, school
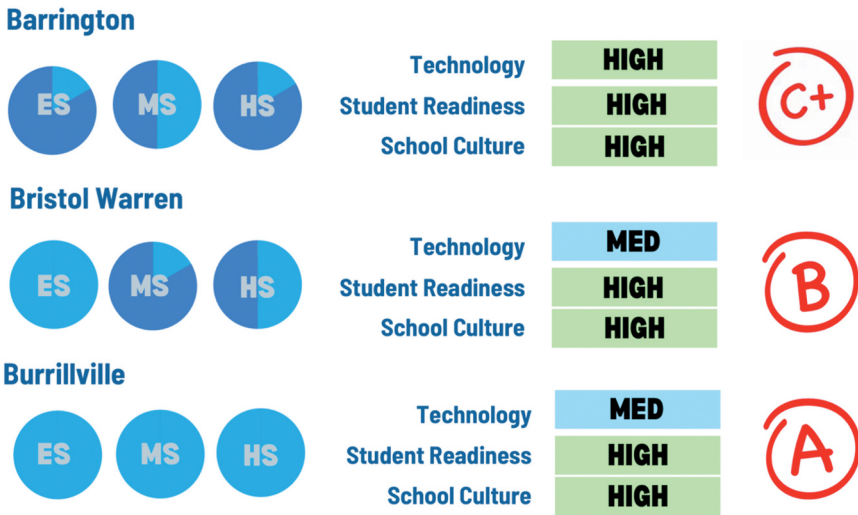
Figure 1. Example of Community Report Card Findings.

leaders, parents, community members, and elected public officials. Our community partner noted that 47% of high school students in the state get an opportunity "to write an article or create a media presentation that advocates for or against a specific action, using reasoning and evidence to defend their point of view," while only 16% of students learn about "how advertising is targeted to increase its effectiveness and how selling audience attention is the way that media companies make money.

For this reason, we produced a report with statewide findings, followed by a presentation of results in a "community report card" style by reporting results as a single letter grade, ranging from A+ to D-. Figure 1 shows how we depicted MLI results for three school districts. It shows how the town of Barrington received a C grade for lower-than-average scores at the elementary level, average scores at the middle school level, and lower-than- average scores at the high school level. Bristol Warren received a B grade for higher-than- average scores at the elementary level, lower-than-average scores at the middle school level, and average scores at the high school level. Finally, Burrillville received an A grade for higher-than-average scores at the elementary level, higher-than-average scores at the middle school level, and higher-than-average scores at the high school level.

Discussion

This study has validated a measure that assesses the level of curriculum implementation of media literacy learning activities in schools and communities. This measure may be useful for research, policy, advocacy, and curriculum

innovation. By using quota sampling to ensure that the perspectives of diverse stakeholders across the state were represented, this research helped increase public awareness of media literacy pedagogies.

This research has implications for educational leaders and policy makers. As national, state, and local laws begin to mandate media literacy education around the world, measures of curriculum implementation will become increasingly important because the best practice literature suggests that media literacy is best integrated into existing curricular areas of language arts, social studies, health, and technology education. Because educational policies at the local, state, and national levels also influence how digital and media literacy education is practiced in schools, disparities in implementation also need to be documented. Future research should examine geographic and sociodemographic disparities within and across communities. Future research on the implementation of media literacy learning activities should also examine the relationship between media literacy policies at the local and state level and disparities in implementation across schools and communities in the United States.

The MLI Index may also have a role to play in building public awareness of media literacy education. Community report cards were pioneered by public health professionals and they now used widely in education and other fields (National Research Council, 2004). Community report cards use survey and interview methodologies to provide a snapshot of a phenomenon of interest through the use of indicators or measurements of local trends, where data is synthesized to inform the general public. Such reports are used increasingly across the United States to bring valuable information to community members and service groups in ways that help policymakers make resource allocation and other decisions (Community Toolbox, 2018).

Future research should continue to improve the MLI Index by administering the survey using probability sampling. While quota sampling was effective in ensuring that a diverse spectrum of citizens in each of the 24 school districts of Rhode Island were queried about their perceptions of media literacy implementation, the sample is not representative of the entire state population. Quota sampling may have been biased towards those who were already familiar with the concept. In the future, probability sampling should be used to ensure that the sample is representative of the population of the state.

Researchers should also adapt the MLI Index to examine the perspectives of current students or recent graduates. It could be argued that these individuals are among the most well-suited to reflect on their own media literacy learning experiences. Future research should implement the MLI with current students and recent graduates to determine its potential utility with this important group. Comparative studies that examine student perceptions in relation to the perceptions of teachers, librarians, and school leaders could be most insightful.

It's possible that the grade bands we identified for the MLI items limited participants' responses. We presented the items to survey participants by offering suggested grade bands and we believe it helped with the comprehension of the survey. Items were clustered together by grade bands to help participants visualize media literacy pedagogies with learners of different ages. But it is possible that the identification of grade bands aligned with a particular subset of ML learning activities may have affected how some participants respond to survey items. For example, it's possible that a classroom teacher might have reported that students in elementary school did not get exposure to a particular pedagogical practice, even while knowing that students in the middle school did encounter this practice. Certainly, some of the items presented in the MLI are specifically relevant to a particular age group, but other activities could be used with younger (or older) students.

The MLI Index may be useful as a policy lever for curriculum innovation. A community report card on media literacy education in the schools may inform elected public officials, school leaders, parents, and other stakeholders about the likelihood that students are getting opportunities in school to advance media literacy competencies. By reporting reliable and trustworthy evidence of media literacy implementation practices at the community level, it is possible that the MLI Index has the potential to increase public awareness of the core learning activities of media literacy education and of the resources required to effectively and equitably integrate media literacy pedagogies into curriculum and instruction.

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