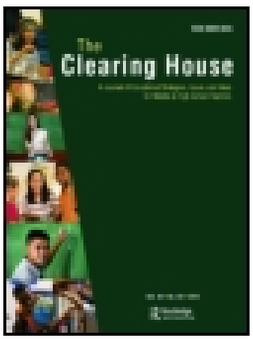

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Literacy across the Disciplines: Development and Validation of an Instrument to Assess Literacy Instruction in Middle and High School Classrooms

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ABSTRACT

Nationally published research suggests middle and high school educators are often experts within their respective disciplines, but they may be unprepared to effectively consider literacy needs and ways to incorporate literacy within their discipline. To better understand teachers' perceived capabilities in their ability to teach and incorporate components of literacy within their classroom, we developed a survey to measure teacher self-efficacy in teaching content-area and disciplinary literacy. We explain the four stages of validation and provide examples of needed revisions to our survey. The survey was designed for immediate use with middle and high school teachers in South Carolina, but it could be used by any school, district, or state.

KEYWORDS

Needs assessment; self-efficacy; content-area reading and writing; disciplinary literacy

The field has recently seen a resurgence of interest in both content-area and disciplinary literacy as a way to support middle and secondary students' growth in literacy, and many states and universities have begun to develop professional development for teachers around these issues. Nationally published research suggests that middle and high school educators are often experts within their respective disciplines, but they may also be ill-equipped to effectively consider literacy needs and ways to incorporate literacy within their discipline (Savitz, Allington, and Wilkins 2019; Ness 2009). Yet, too often, learning experiences for teachers are designed without attention to what teachers themselves see as areas of strength and need (e.g., Hawley and Valli 1999), and teachers may reject professional development (PD) in content-area and disciplinary literacy because they do not conceptualize themselves as teachers of reading (e.g., Hinchman and O'Brien 2019).

When creating a survey, reliability and validity of the survey need to be assessed prior to sending it to possible participants, as there are many factors that can enhance or detract from the validity and reliability of a survey (Alvarez and VanBeselaere 2005). For instance, when developing questions, prior research and literature should be used as a reference, expert consultants should be utilized, and the items should be pretested with members that represent the targeted audience. In addition, the use of eyeballing, statistical tests of correlation (i.e., test-retest, parallel forms, Cronbach's alpha), interrater/intrarater, and face validity could help enhance the reliability and validity of the survey.

In this manuscript, we outline the multi-step process through which we worked in order to validate the survey. Understanding the validation of this instrument is important because a validated and reliable survey better ensures that results accurately measure the constructs the survey purports to address. Mullens and Kasprzyk

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(1999) state that a well-designed, focused survey could be cost effective for administrators and place only a limited burden on respondents; thus, we wanted first to gather teacher voices to better understand teachers' own assessments of their self-efficacy. Why do we need a manuscript that goes through these steps? When creating a survey, there are specific protocols that need to be established to ensure that the findings are valid and reliable. If validity and reliability are not identified, there are questions about the findings and lessons learned. This is important as users can understand what the focus of the survey includes while ensuring practicality & usability, making sure that instrument fatigue does not occur (Mullens and Kasprzyk1999).

We have administered this survey across the state of South Carolina, and the analysis of these data are still underway. Thus, we do not present those results here. Instead, the purpose of this manuscript is to describe the process through which this manuscript traveled to ensure that others–across the country and globe–can make use of our survey for their own local purposes and needs. This work provides an opportunity to be reflective as it relates to literacy practices in and across the disciplines. The purpose of this manuscript is to validate the instrument as well as make available the instrument to the field so you can use it in your placements. A validated survey ensures that validated constructs are accurate and can identify necessary paths for professional development.

This manuscript, and ultimately the instrument is of interest to classroom teachers, building and district administrators, and content area coaches. Classroom teachers can use this manuscript to better understand the focus of the instrument but also understand the elements of literacy instruction in the content areas. To ensure that professional learning opportunities for teachers emphasize what teachers see as relevant to their work, the field needs to continually involve teachers' voices. Building and district administrators can use this manuscript to consider the assessment and development necessary as literacy instruction is embedded in content area classrooms. Administrators can use this survey to gather perspectives at the local or district level to see what initiatives or development opportunities are needed. Instructional coaches can use this manuscript and the instrument to calibrate expectations of content area literacy instrument and assessment. Coaches can also administer this instrument at the school level to identify necessary professional development opportunities: Is a school wide initiative needed, or is it content specific?

Across all three groups, this instrument provides an opportunity to think about the knowledge, skills, and dispositions necessary in literacy instruction in the content areas. In this manuscript, we present a tool for better understanding teachers' view of content-area and disciplinary literacy. Thus, this article describes the development and validation of a needs assessment survey designed to understand teachers' self-efficacy related to their knowledge and implementation of content area and disciplinary literacy. The survey is currently being distributed to all middle and high school teachers in South Carolina. This survey instrument will be used to determine perceived teacher efficacy related to embedding literacy within content-area classrooms and to inform future professional development opportunities and resource development. The state grant funding is focused on supporting content-area and disciplinary literacy in South Carolina middle and high schools.

We examined content area and disciplinary literacy from the perspective of teacher self-efficacy because self-efficacy has been found to influence the courses of action people choose to pursue, how much effort they put forth in given endeavors, and how long they will persevere in the face of obstacles and failures (Bandura 1997). It is particularly important to understand teachers' self-efficacy in content-area and disciplinary literacy because content-area teachers in middle and high schools typically identify with the content area itself and do not necessarily conceptualize themselves as teachers of reading (e.g., Daniels and Zemelman 2014).

As part of this, a teacher's insight is beneficial as they can have an awareness of these kinds of instruments and items. To gather teacher voices, through this manuscript we are making transparent our attempts to ensure teachers are part of the process. We believe content-area and

disciplinary literacy integration in middle grade and high school classrooms is influenced by educator self-efficacy and resilience to adversity as they strive to balance the cycle of environmental demands and sense of accomplishment. The full completed survey is available upon request.

Conceptual framework

This research reports on the development and validation of an instrument that will measure teacher efficacy in teaching content-area and disciplinary literacy in middle grades and secondary placements. In this we seek to frame and better understand content-area and disciplinary literacy (CADL) as measurable constructs.

Content-area reading and writing (CARW)

For several decades, research has provided evidence that instruction focused on content-area and disciplinary literacy can support students in meeting widely held goals for an educated populace. Content-area literacy focused on general reading and comprehension strategies (e.g., summarization, prediction) utilized across subject matters to interpret content-specific texts (Shanahan and Shanahan 2008). Tools and strategies used are not unique to a specific discipline, although they are often adapted for specific content-area learning. For example, in social studies, students can summarize a speech, and then immediately apply this skill in an art class when asked to summarize key events in an artist's life. However, as teachers have made deliberate efforts to connect literacy to the requirements of a discipline, strategies have become less general and more specific to that discipline's unique learning (Fang and Schleppegrell 2010).

Disciplinary literacy (DL)

Disciplinary literacy uses literacy in the ways experts within the discipline read, write, think, reason, and process information, as these processes are unique to each different discipline (LaDuke, Lindner, and Yanoff 2016; Lent 2016; Moje 2008; Pearson and Hiebert 2013). Specifically, instruction that highlights disciplinary literacy can support students' higher order thinking skills, critical thinking skills, problem-solving skills, ability to navigate and understand multiple perspectives, engagement in collaborative practices, and community-building skills (Lent and Voigt 2019; Moje 2015; Spires et al. 2018).

In disciplinary literacy, the goal is not necessarily for history students, for example, to learn a host of content-neutral reading comprehension strategies. Instead, the goal is that history students will learn to think and act like historians—which necessarily entails learning to read and write as historians do. Thus, a U.S. History teacher teaching from a disciplinary literacy standpoint would work not to teach generally applicable comprehension strategies, but would instead "consider how best to model for her students the ways in which she reads historical texts, as a disciplinary insider trained as a historian. She would still be teaching the skills of comprehension, but in ways that are more closely connected to the ways historians think and communicate" (Dobbs, Ippolito, and Charner-Laird 2017, p. 18).

Intersections between CARW & DL

Attention to both content-area and disciplinary literacy is mounting: A number of state and federal policies advocate for increased attention to middle and high school students' literacy development across content-areas/disciplines (National Council for the Social Studies 2013; Read to Succeed 2014; Striving Readers Comprehensive Literacy Program 2017). The term *disciplinary literacy* is often used interchangeably with *content-area literacy*, but they are different. Content-area literacy is based on the assumption that, if students gain proficiency in reading comprehension, generally speaking, their proficiency in specific subject areas will also increase. Disciplinary literacy, on the other hand, is based on the stance that ways of participating in literacy are different across subject matters, and therefore subject-specific literacy practices need to be modeled and taught (Dobbs, Ippolito, and Charner-Laird 2017). Thus, content-area literacy and

disciplinary literacy are founded upon very different theoretical bases and have different goals.

We take the stance of Shanahan and Shanahan (2008), who identify content-area literacy as an intermediate level where teachers focus on supporting students' reading comprehension and other intermediate skills, while disciplinary literacy refers to those literacy strategies and practices specific to each individual discipline. The International Literacy Association (2017), as well as a number of literacy researchers (e.g., Dobbs, Ippolito, and Charner-Laird 2016), have found that both CARW and DL are needed for student success, because students rely upon both content-neutral literacy strategies and disciplinary literacy strategies in content-area classrooms. In short, content-area and disciplinary literacy are complementary but not interchangeable.

Self-efficacy

With the purpose of seeking to understand teachers' perspectives regarding their own confidence as teachers, Bandura's (1995) notion of self-efficacy drove our development of this instrument. Bandura (1995) posited that self-efficacy, or "belief in one's capabilities to organize and execute the courses of action required to manage prospective situations" (p. 2), is needed to teach effectively and efficiently. These beliefs about personal competence affect behavior in multiple ways, including how teachers make choices and decide upon what courses of action to pursue (Bandura 1997). In other words, teachers will engage in tasks in which they feel competent and confident, avoiding tasks in which they do not (i.e., if they are not trained in new teaching methods, they will not feel comfortable, and will avoid these tasks). Many secondary educators have not received substantive training in literacy strategies or interventions and may not feel confident in their abilities to critically evaluate curriculum (Dyches 2018) and teach them without proper professional development (Ness 2009). Thus, if teachers do not feel capable of incorporating support for literacy into their classrooms (Hall 2012), then implementation of strategies will not be successful and their students will not progress (O'Connor and Korr 1996).

Research contexts and positionality of research team

South Carolina's low rankings in education are widely noted. The most recent administration of the National Assessment of Educational Progress (NAEP), which is often referred to as the "Nation's Report Card," showed that South Carolina eighth graders lagged behind the national average in both reading and writing: Only 29% of eighth graders scored at or above proficiency in reading as opposed to the national average of 32% (McFarland et al. 2019). Similarly, on the 2019 South Carolina READY assessment, only 45% of students either met or exceeded expectations for the ELA assessment. When looking at the writing portion of this assessment, only 33% of students were categorized as "high performance" writers.

In response to these outcomes, in 2015, the South Carolina Department of Education passed the Read to Succeed Act, mandating that all educators in the state receive professional development or coursework in content-area and/or disciplinary literacy instruction (Reeves 2018). This includes individuals pursuing or maintaining certification in *all* areas including science, math, social studies, English Language Arts, the arts, world languages, and physical education.

As secondary literacy instructors and professors of education at multiple institutions of higher education in South Carolina, our long-term goal is to work with educational stakeholders at a variety of levels to build systems better capable of supporting teachers to do the complex, and necessary, work of incorporating content-area and disciplinary literacy into subject-specific instruction. Our initial aim was to have a hand in designing professional development in content-area and disciplinary literacy. Yet, we were also insistent that we should design professional development in light of the needs that teachers professed–not those that were assumed by those of us who no longer teach in secondary schools. Thus, we wanted first to gather teacher voices to better understand teachers' own assessments of their self-efficacy.

Our work is supported by a grant from the South Carolina Middle Grades Initiative, a Center for Educational Partnerships hosted at the University of South Carolina. The grant funding is focused on supporting content-area and disciplinary

literacy in South Carolina middle and high schools. As professors and instructors at institutions of higher education who teach CADL courses, we highly value these pedagogical approaches. We are also keenly aware of the difficulties that such instruction presents. Content-area teachers may recoil from the idea that they are to become "reading teachers"– and rightly so. They are experts in their content, not necessarily in reading theory or practice. In our experience, much of the push-back against both stems from a lack of familiarity with these terms or misunderstandings about how to design pedagogies that support CADL. This is why we believe instruction and support for teachers' integration of CADL practices is imperative: CADL instruction can support students in meeting proficiency goals because such instruction focuses on teaching students in all disciplines how to read, write, reason, and process information across disciplines, using inquiry and authentic real-world problems (Lent 2016).

Instrument development

In the following sections, we describe four phases of our survey's development. First, we (the research team) identified the components involved in literacy instruction in the content-area using current literature on CADL. Second, we created items and tested them through content validation by multiple experts in the field of literacy, survey research, and/or CADL. Third, we conducted cognitive interviews (Collins 2003) with middle grade and high school teachers in the state. Lastly, we conducted a final content review and validation of all items. We modified the survey for content, length, and clarity based on feedback provided at each stage of the process. Future versions of the survey may focus on translations and localization of items to support non-native English speakers.

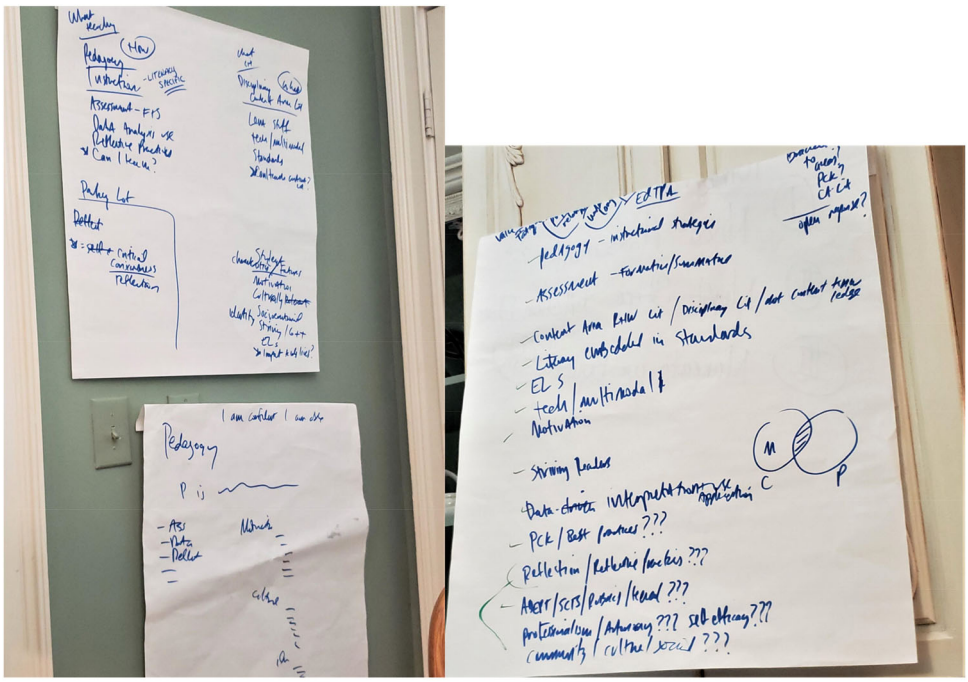
Stage one: identifying constructs & literacy practices

Instrument development began with a previously developed survey on secondary teachers' self-efficacy related to implementation of literacy Response to Intervention (Savitz 2017) and then discussed self-efficacy theory in the context of survey development. We used the prior survey as a model, but moved on to discuss constructs as guided by our research purpose. We used this instrument because its framework provided us with the conceptual lens we sought – teacher perceptions of their self-efficacy – since a self-efficacy lens provides insight into the aspects of CADL instruction with which teachers feel most, and least, capable, and therefore where they will likely need the most support as they take on the challenge to incorporate literacy within their classrooms. As was discussed, this is especially important with content-area and disciplinary literacy, because secondary teachers identify strongly with the content-area itself and often report receiving little preparation in supporting literacy in their content areas. The initial survey's items were either adjusted or rewritten to identify teacher self-efficacy in their knowledge of and ability to implement CADL practices.

In our revisions and additions to each individual item, we were guided by the following principles: Items need to measure the construct of interest, be culturally appropriate, be understandable to all participants, and be answerable. In addition, questions should not be double-barreled (too many concepts being asked in a single question), should not require a forced answer of participants, and should not be too lengthy (Fowler 2014). As with any research, there are ethical considerations that must be thought through.

When creating a survey, reliability and validity of the survey needs to be assessed prior to sending it to possible participants since there are many decisions made that can enhance or detract from the survey's validity and reliability (Alvarez and VanBeselaere 2005). In the development of this instrument, we used prior research and literature as references, we recruited expert consultants, and we pretested items through cognitive interviews with volunteers who represented the targeted audience.

As a result of a review of the literature and discussions as a research team, we decided to focus on four areas as they relate to CADL: sociocultural contexts of literacy instruction; pedagogy; content-area and disciplinary literacy; and teacher dispositions and demographics. We,



Note: Posters from survey design retreat.

Figure 1. Research team planning documents.
Note: Posters from survey design retreat.

the authors of this study, wrote, debated, amended, and revised the initial constructs and items within each focus area. Figure 1 represents some of our conversations as we mapped out each construct.

Sociocultural contexts of literacy instruction

The items in this area were designed to help explain how teachers make sense of the ways that social contexts (i.e., discourse communities, communities of practice) influence students' development of literacy practices, knowledge, and skills. This framing of sociocultural contexts comes from the Programme for International Student Assessment (PISA) developed by the Organization for Economic Co-operation and Development (OECD. 2018), and includes three sub-constructs:

- Degree of exposure to various kinds of print in home, school, and public environments
- Reading practices/habits
- Attitudes toward reading and reading interests

Where necessary, we revised these items to include not only reading, but also its intersections with writing and composing, since reading and writing are interconnected processes and both are central to literacy (Graham and Hebert 2010).

Literacy-rich pedagogy

The items in this area were designed to identify teachers' confidence level in their knowledge about and ability to implement various aspects of literacy-rich pedagogy. In the development of this instrument, we defined *pedagogy* in accordance with Murphy (2008) as being "about the interactions between teachers, students, the learning environment, and learning tasks" (p. 35). We defined a "*literacy-rich pedagogy*" as focusing on teachers knowing their students and being able to implement strategic reading and writing instructional practices using appropriately leveled print, nonprint, and digital texts so that they might support students in developing discipline-specific knowledge, concepts, and ways of thinking. We categorized the questions based on three domains of pedagogy: curriculum, instruction, and assessment.

Content-area and disciplinary literacy (CADL)

The items in this area were designed to examine literacy instruction in the different content-areas as reflected in middle grades and high school

classrooms. We designed these items in light of research from Lent and Voigt (2019), as well as content-area standards documents where necessary (i.e., Common Core Math Practice Standards). The identified content-areas included: Physical Education, Visual Arts Education, English Language Arts Education, Mathematics Education, Science Education, Social Studies Education, Performing Arts Education, and World Language Education. These items were based on Lent and Voigt's (2019) appendices, as well as our discussions of commonly offered related arts courses in middle and high schools. While we recognize this is not an all-inclusive list, our rationale was that additional educators, like those in special education, would fall under one of the main categories. A limitation of this is that we did not include questions for every possible subject area, such as technology or business. We made this decision because such courses are not necessarily disciplines (see, e.g., Wolsey et al. 2019).

Teacher dispositions and demographics

The items in this section were included to better understand descriptive information about participants and their attitudes toward students and literacy instruction in the content-areas. This construct included teachers' demographic information, their educational history, and relevant experience. Items also asked about school location and whether or not the participant had taken a Read 2 Succeed course, which is a course on CADL required by the state. In addition, participants were asked about their beliefs related to literacy instruction, student achievement, and school climate and culture.

Stage two: content validation with experts

In order to establish item validity, the instrument went through two separate stages of content validation. The first content validation process involved the use of eight experts who provided feedback that assisted in revising the definition of constructs and the validation of items through both qualitative and quantitative methods (Haynes, Richard, and Kubany 1995). Each expert reviewer was intentionally selected based on their extensive knowledge in particular sub-fields (e.g., literacy assessment, pedagogies in cultural and linguistic diversity), as well as a track record of significant teaching and research in that area. All expert reviewers were from institutions of higher education outside the state of South Carolina, so that the survey would represent national expertise about each construct. This decision was made to ensure that constructs and items effectively measure the scope and nuance of content-area and disciplinary literacy. As is later discussed, we elected to conduct cognitive interviews with teachers in South Carolina, because that was the population to whom the survey was ultimately geared.

The experts were divided into two sets of review panels with one set (4) reviewing the entire instrument and the other set (4) reviewing only the CADL items to provide feedback. The decision was made to break the reviewers into two panels to highlight their areas of expertise and reduce the level of work required of each reviewer. Each expert received the full survey, along with theoretical definitions for each of the constructs, and a guide for reviewing the survey. They were given one month to send back their feedback. Experts were asked to provide feedback on each section using the following prompts:

- Do the questions appropriately align with the constructs in each section?
- Are there items that should be added to more completely represent the constructs in each section?
- Is terminology clearly defined?
- Does the wording of the constructs and items lend itself to possible misunderstandings or multiple interpretations?
- Are there comments regarding usability and practicality of the items within each section or of the overall survey?
- Please provide any other feedback on items in this section.

Once we received feedback from all reviewers, we systematically addressed each item, discussing and applying the correlating expert feedback. As we discuss below, the findings from the first stage of content validity showed not all of the experts agreed upon which items related to which constructs. As a group, we discussed conflicting feedback and included our own thoughts based on

Table 1. Sample of item revisions made after review by experts.

Item Section	Original Item	Item Feedback	Revised Item
Sociocultural Contexts of Literacy Instruction	I am confident in my ability to leverage students' out-of-school literacies to engage and motivate students.	"Leverage" has a corporate feel to it, use a different term.	Make instructional use of students' out-of-school literacies to engage and motivate students.
Pedagogy	I am confident in my ability to use a critical stance on curricular resources to ensure their instructional goals meet the literacy demands of my content area.	Critically evaluate curricular resources … reword. Also, curricular resources don't really have instructional goals.	Critically evaluate curricular resources to ensure that the resources meet the literacy demands of my content area.
Disciplinary Literacy for English Language Arts	I am confident in my ability to provide instructional support for the reading process and components of literacy (comprehension, phonics, phonological awareness, fluency, context clues, visualization, vocabulary)	Too many options listed. Simplify. Rely on definitions and glossary for each section.	Provide instructional support for the reading process and components of literacy (comprehension, vocabulary).
Teacher Dispositions and Demographics	I think my students are good readers.	Focus on possibility and not from deficit mindset.	I think my students have the ability to be good readers.

our own knowledge of the research, as well as our experience as teacher educators and providers of professional development. Most often, these revisions included, but were not limited to, more consistent or parallel phrasing of terminology in items and breaking down "triple-barreled" items into measurements of individual constructs.

Both the quantitative and qualitative feedback from experts suggested many items were multidimensional and the construct definitions were inadequate. Content experts suggested reframing the different ways in which students use literacy (e.g., speaking, listening, reading, and writing) in school, and integrating more language about instructional supports in literacy instruction (e.g., providing instructional support for reading prior to text interaction). This feedback identified a need to be less discipline-specific in development of items while including more clear definitions and inclusion of other terms in the glossary. Examples of this included a broader definition of topics related to "judging text complexity" and providing examples for "funds of knowledge," a concept not widely understood by teachers.

Other recommendations were related to word choice and grammatical elements. For instance, the experts recommended removing the term 'phonics' because this instrument was developed for a middle and high school audience and phonics is not a concept usually addressed at this educational level. They also raised questions about our use of the term "developmentally appropriate" to describe print, nonprint, and digital texts teachers would use in instruction. Finally, their feedback suggested including more questions about evidence-based interventions to support reluctant readers and writers (Table 1).

Stage three - cognitive interviews with middle grades and high school educators

The second round of content validation included cognitive interviews (Collins 2003) with 19 high school and middle school teachers from the state of South Carolina. The purpose of this round of reviews was to ensure that items were understandable and would not confuse educators in the different grade levels, in different content-areas, or with different experience levels. Also, because one of our main goals was to garner teachers' perceptions, it was especially important to incorporate teachers' voices at this phase. We attempted to conduct interviews with new and veteran educators within middle grades and high school and from each identified content-area, from demographically diverse institutions throughout the state. We reached saturation in feedback and felt comfortable with the responses we received from each of the different educator categories.

In the hope of alleviating issues related to social desirability and acquiescence (Warnecke et al. 1997), we informed participants ahead of time why they were recruited, how their information was valued and would be used, and the benefits (short term and long term) of participation. We used similar methods with the cognitive interviews we had used with expert reviewers, with the additional request related to item clarity

Table 2. Sample of item revisions made after review by content area teachers.

Item Section	Original Item	Item Feedback	Revised Item
Sociocultural Contexts of Literacy Instruction	I am confident in my ability to provide opportunities for students to bridge home literacy learning (funds of knowledge, home language) with learning that takes place in school.	The terms in the examples may be confusing. Participants may not understand "funds of knowledge."	I am confident in my ability to provide opportunities for students to bridge home literacy learning, and background experiences with learning that takes place in school.
Pedagogy	Determine text complexity of a print, nonprint, or digital texts.	Separate the items based on the types of text. Explain text complexity as it may be an unfamiliar concept.	Determine text complexity (quantitative, qualitative, reader and task) of print. Determine text complexity (quantitative, qualitative, reader and task) of non-print or digital texts.
Disciplinary Literacy for English Language Arts	Provide instructional support for teaching the writing process.	Reword teaching writing as a process. Include examples of the steps involved.	Provide instructional support for teaching writing as a process (prewriting, drafting, revising, editing).
Teacher Dispositions and Demographics	No original item included.	Items loosely asked about teaching of literacy skills in the content areas. Experts suggested that we add an item that specifically addressed this.	Teaching literacy skills is the responsibility of all teachers in all content areas.

and understandability from a disciplinary viewpoint. However, with each South Carolina educator, we read items one by one. This allowed for the researchers to answer teachers' questions or provide requested elaboration.

Findings from cognitive interviews with teachers suggested improvements in a wide variety of areas related to wording of items and organization of survey content. In addition, many teachers were concerned with demographic questions that related to race or specific school districts - worried that someone may be able to later identify them and their responses. We found teachers had the least knowledge of sociocultural contexts of literacy instruction as opposed to other areas on the survey. One of the key areas of feedback included the framing of reading, identified as "making meaning from text". This was identified in the survey as including "traditional reading practices of print text, but it may also include visual, aural, and digital texts such as film, music, or a website." Educators asked whether digital texts are different from visual texts. Other feedback questioned whether some of these descriptions/definitions may confuse participants taking the survey.

Teachers also identified challenges they may have with recognizing all forms of literacy and differentiating between in-school and out-of-school literacy practices and texts. As an example, one educator indicated whether the phrase 'leverage out of school literacies' would be understood. Several educators suggested that we add one or two examples of different forms of out-of-school literacy in parentheses (speaking, listening, reading, and writing) as well as the different areas where these may exist (personal, educational, occupational, public).

Assessment of literacy practices also proved to be confusing, since educators suggested more definitions for formative and summative assessments, along with specific examples for each (e.g., observations, one-on-one conferences, use of drawings, teacher questioning, checklists, exit cards). Lastly, several educators indicated they would prefer we stay away from the term "informal" as it is often interpreted as inferior when compared with "formal" assessments (Table 2).

Stage four: final content review and principal component analysis

The final stage consisted of the researchers, along with one outside reviewer and new member of the organization, examining the entire survey and all its revisions one final time to check for grammatical, mechanical, formatting, or other errors. In addition, a principal component analysis (PCA) was conducted to reduce the number of items (43) within the first section of the survey into components to represent data. A PCA is a statistical exercise that takes a large data set and seeks to provide a complete, but also simplified explanation of what makes the data set unique. The goal is to increase interpretability while at the same time minimizing information loss. We created a scale, you can pull the individual scales and the items included to better understand these values and how they impact your placement. The

PCA only included the first section as the second section included items specific to each discipline and the third section asked thirteen items in Teacher Dispositions and Demographics. This final stage, and the results of the PCA will help you understand the impact of this work, but also calibrate your view of CADL.

Measures of sampling adequacy revealed no issues with the factorization of the correlation matrix. Bartlett's test of sphericity (5979.116, $p < 0.01$) was significant along with the KMO value (0.915). Complex loading items and items loadings < 0.4 were deleted. During the first PCA, three items that cross-loaded on more than one component and whose loading weights were approximately the same to each other indicating no specificity of the variable, were removed. This removal made the model stronger with an increase in the percentage variance. Varimax rotation was chosen because it aids interpretation when the components are to be used as dependent variables (Tabachnick and Fidell 2001), with a seven-component solution explaining 71% of the variance.

The first component, Equitable Instruction and Critical Literacy, explains almost 50% of the variance of the entire data set (see Table 3). The other six components appear in a cluster to explain the rest of the variance: Analysis and Purposeful Use of Text, Authenticity, Differentiation of Instruction, Progress Monitoring and Assessment, Instructional Technologies, and Multilingual Literacy Practices. Although the last component only has two items, we felt that these items were conceptually appropriate being placed together in one component, as both relate to English Language Learners. Therefore, we kept this component.

The final survey contained between 59 and 62 items, depending on the discipline-specific version of the survey that each individual teacher took. All areas of specialization had 59 questions, except for English Language Arts (ELA). Because ELA, as a discipline, has a long history of being centrally implicated in secondary literacy instruction, we included 62 items for ELA teachers.

The survey was designed so participants first read and provide consent, and then answer a yes/no question to ensure the educator is currently teaching within South Carolina. After choosing, yes, teachers are directed through each of the four parts of the survey. For the disciplinary literacy questions, teachers are asked to identify with and choose one of the listed options since questions are specific to each discipline. The survey was administered using Qualtrics, which directs teachers to respond to only one of the ten disciplines for which we created items.

Implications

Too often, professional development is a top-down exercise with little input from teachers regarding what they need or want to strengthen their daily work. As South Carolina began to create policies intended to increase educational stakeholders' interest in and knowledge of content-area and disciplinary literacy, it became clear to us that professional development in these areas could be improved if we first worked to understand teachers' attitudes and self-efficacy in these areas. Thus, we assembled as a research team and undertook this work to better serve educators in the state of South Carolina as they embed literacy instruction in and across their content areas. Our goal was to seek teachers' input to ensure the support and resources we develop and provide are useful, purposeful, worthwhile, and valued by those who will use them. In short, we felt it was imperative that before time and money were spent developing and implementing professional development, we needed to gather information on teachers' views of their own knowledge and implementation of content-area and disciplinary literacy.

This manuscript is helpful as you can better understand what we were trying to measure and why. Educators, administrators, and coaches can administer this survey in their local contexts, and use this manuscript to develop some frequencies and comparisons. This manuscript can be used with the instrument to better understand what the results mean and also areas that are not examined by the instrument. Teachers, administrators, coaches can better understand the purposes and findings of this survey.

Results from this survey will be used to inform the design of professional development opportunities intended to support content-area and disciplinary literacy in South Carolina's middle and

Table 3. Principle component analysis with varimax rotation and coefficient alphas.

Item	Component 1: Equitable Instruction and Critical Literacy ($a = .919$) Loading
Provide opportunities for students to examine their current roles, their possible future, and the roles of others in society	.71
Create instructional opportunities for culturally relevant and culturally sustaining pedagogies	.69
Provide opportunities for students to address or counteract harmful narratives	.63
Create opportunities for my students to critically analyze text	.56
Create opportunities for my students to critically respond to a text	.58
Provide differentiated instruction appropriate for students' specific needs	.56
Use evidence-based interventions to support reluctant writers	.53
Support students to use multiple literacy strategies prior to engaging with all types of text	.48
Use evidence-based interventions to support reluctant readers	.47
Item	**Component 2: Analysis and Purposeful Use of Text ($a = .932$) Loading**
Determine text complexity of digital text	.84
Determine text complexity of print	.81
Determine text complexity of non-print	.76
Critically evaluate course materials to ensure that they meet the literacy demands of my content area	.57
Organize texts to support content area and literacy learning	.52
Provide instructional support for complex texts	.52
Item	**Component 3: Authenticity: Engagement, Interest, and Relevance (a = .896) Loading**
Students are interested and engaged in literacy in school	.79
Students are interested and engaged in literacy outside of school	.76
In school literacies to engage and motivate students instructionally	.68
Out-of-school literacies to engage and motivate students instructionally	.67
To bridge home-literacy learning, background experiences, and home language(s) with learning	.58
Connect literacy practices used in my content area to students' personal lives	.47
Texts that are appropriate to my content area(s) and allow students to see people/characters who are both like and unlike themselves	.47
A wide range of print, nonprint, and digital texts within my content area that are appropriate for students' backgrounds and interests	.43
Item	**Component 4: Differentiation of Instruction (a = .912) Loading**
Motivate students to read in my content area	.74
Motivate students to write in my content area	.65
Provide opportunities for independent reading within my content area	.61
Support students to use multiple literacy strategies during their engagement with all types of text	.57
Use evidence-based interventions to support reluctant readers	.50
Use evidence-based interventions to support highly skilled writers	.49
Support students to use multiple strategies after engaging with all types of text	.48
Use evidence-based interventions to support highly skilled readers	.47
Item	**Component 5: Progress Monitoring and Assessment (a = .860) Loading**
Use feedback to engage and motivate students	.84
Use formative assessments	.76
Use summative assessments	.75
Balance curricular expectations and content standards with students' interests	.54
Use collaborative learning opportunities to help students reinforce content area literacy learning	.51
Item	**Component 6: Instructional Technologies (a = .909) Loading**
A wide range of digital and multimodal tools to support students' literacy learning	.81
A wide variety of digital texts and tools to support student learning goals in my content area	.81
A wide variety of strategies to effectively utilize instructional technologies to support student learning goals in my content area	.71
Item	**Component 7: Multilingual Literacy Practices (a = .909) Loading**
Use evidence-based interventions to support English language learners' writing	.79
Use evidence-based interventions to support English language learners' reading	.71

high schools. Indeed, this was the original reason that we designed the survey–professional development is useful to the extent that teachers perceive it to be connected to their daily work (Cobb, Jackson, Henrick, and Smith 2018), so it is essential that teachers' voices are heard in its design (see also, Mertler 2009). Data gathered can also be used to inform and revise current pre-service and graduate course offerings, so that they can be better tailored to the specific needs of those who teach in particular content areas, grade levels, and even regions.

We will also share the results with South Carolina teachers, as well as school and district leaders, in order to collaboratively develop a plan of action to support students in middle grades and high school classrooms. As part of our work with an organization we have established, LiD 6-12 (Literacy in the Disciplines), we have presented at a number of state, national, and international conferences, and we have learned much about the local contexts in which educators work to support secondary students' literacy. In presenting this work in a number of venues, we hope to continue and deepen conversations about what teachers themselves hope to gain from discussions and professional development about content-area and disciplinary literacy. The results will also be shared with state leaders as they develop goals and objectives for improving literacy instruction regionally.

As we began to develop and validate the instrument, it also became clear that metrics like this are in need in other states and regions. South Carolina is not the only state where students' performance on national benchmarks demonstrates the need for a continued focus on literacy throughout middle and high school and in specific content areas. Also, as we worked on this survey, we fielded numerous requests from researchers and other educational stakeholders about how they might make use of this needs assessment survey in their own contexts. Therefore, by reporting on the development and validation of this instrument, we hope that others may find it useful as a means of measuring secondary teachers' self-efficacy in content-area and disciplinary literacy. We are happy to share the survey with educators and researchers in other states and countries who may seek to administer a similar survey in their local areas to better understand and assess the intersections of literacy pedagogy in content area classrooms. Our objective is to work together to better understand the support that teachers value, find useful, and need in content-area and disciplinary literacy so that teachers–in turn–can better support secondary students to learn in the content areas.

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