

Educators' Perceptions and Knowledge of the Common Core State Standards

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Introduction

As with many previous K-12 educational reform efforts, expectations that the Common Core State Standards (CCSS; National Governors Association Center for Best Practices, 2010) will assist students in learning so that they can prepare for college and the workforce are very high (American College Testing, 2012). Briefly, the CCSS “are designed to ensure that students graduating from high school are prepared to take credit bearing introductory courses in two- or four-year college programs or enter the workforce” (Council of Chief State School Officers, 2013, p. 1). There is an assumption that CCSS will provide a concise framework for increasing student learning in mathematics and English language arts, prepare students for college, and ensure that the demands of a highly skilled and internationally competitive workforce are fulfilled

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(National Governors Association Center for Best Practices, 2010). It is the prerogative of the states to adopt the standards; however, the considerable alignment between the standards and federal grant funding, educational policy, and student learning assessments is motivational.

It is anticipated that CCSS will enable students to learn more content, develop deeper content knowledge, and progress more effectively along more strategically aligned learning trajectories (Daro, Mosher, & Corcoran, 2011). However, as with any K-12 educational reform effort, the effectiveness of the CCSS is largely dependent on the knowledge and perceptions of the educators who will implement the standards (Bryk & Schneider, 2003). We contend that, if CCSS are to fulfill their intended goals, states, school districts, and educators need to implement the standards with fidelity. Thus, there is a need to understand the degree to which teachers and administrators know and perceive the standards, as their knowledge and perceptions are likely to influence their implementation of the standards.

Investigations of educator perceptions and knowledge of reform efforts are rare. Moreover, our search of the literature failed to reveal any reports of educators' perceptions and knowledge of CCSS. Thus, our research addresses this gap, provides insight into potential issues faced by future K-12 reform efforts, and offers school districts useful information for guiding their implementation efforts.

Review of the Literature

Reform Efforts in Education

The *A Nation at Risk* (Gardner, 1983) report stated that 14% of 17-year-olds and 40% of minority children were functionally illiterate, remedial math courses constituted one-quarter of all mathematics courses taught at public four-year colleges, 70% of high school students could not solve multi-step mathematics problems, and 80% of high school students could not write a persuasive essay. The follow-up report, *Our Schools and Our Future: Are We Still at Risk?* (Peterson, 2003), revealed that standards-based reform efforts were not working effectively, teachers and schools were not being held accountable for student learning, and, more timely, accurate information about student, school, and teacher performance was needed. Since their inception, these reports have served as the impetus behind reform efforts in U.S. education, such as the *Improving America's Schools Act*, the *Elementary and Secondary Education Act (ESEA)*, *No Child Left Behind (NCLB)*, and, most recently, the *Blueprint For Reform Act* (Jorgensen & Hoffman, 2003). Each of these reform efforts serves as an example of the federal government's efforts to improve student

achievement and reverse the lagging levels of achievement reported in *A Nation at Risk* (Rhodes, 2012).

The *Blueprint for Reform* (U.S. Department of Education, 2010) was a reauthorization of ESEA. It focuses on several key priorities, including schools' graduating career- and college-ready students; ensuring great teachers and leaders in every school; meeting the needs of English Language learners; providing a complete education; supporting successful, safe, and healthy learning environments; and fostering innovation and excellence. Most notable in the *Blueprint for Reform* is the requirement for states to work together to develop and adopt common standards in English language arts and mathematics to ensure student preparation for college and career readiness by high school graduation (U.S. Department of Education, 2010).

The CCSS initiative was a state-led effort to create rigorous, clear, and consistent academic standards like those recommended in the *Blueprint for Reform* (Gutierrez, 2011). Sponsored by the Council of Chief State School Officers and the National Governors Association Center for Best Practices, and developed in collaboration with a large number of stakeholders, the goal of the CCSS initiative was to develop standards that could guide states' efforts to prepare students for college and the workforce. While the goals of CCSS and the *Blueprint for Reform* are complementary, CCSS are not mandatory for the *Blueprint for Reform*, and, therefore, the adoption of the standards by individual states is not a requirement (National Governors Association Center for Best Practices, 2012). Nonetheless, the *Blueprint for Reform* mandates that states develop and/or adopt standards to ensure that all students, regardless of race, ethnicity, English proficiency, or disability status, are prepared for college and careers, and CCSS serve this purpose. To date, 45 states and three territories have adopted CCSS as a way to ensure compliancy (National Governors Association Center for Best Practices, 2012).

The ultimate goal of CCSS is to establish what students need to learn to be college and career ready. CCSS also provide practices to guide curriculum structure; however, the standards do not prescribe how teachers are to teach, which provides teacher autonomy to engage students in ways that are most effective for learning. It is the responsibility of the practitioner or teacher to choose how the standards are taught. To do this effectively, teachers need to be knowledgeable of CCSS content and be trained in best practices for implementing high-quality standards (National Governors Association Center for Best Practices, 2012). The latest teacher preparation reform effort initiated by the Obama administration, *Our Future, Our Teachers*, aims to improve teacher preparation

programs as a means to ensure that teachers are equipped with the skills necessary to implement high-quality standards and that students receive the education that they deserve (U.S. Department of Education, 2011). While *Our Future, Our Teachers* addresses the issue of teacher preparation as it applies to future teachers, it fails to address the massive issue of ensuring that in-service teachers are equipped with the knowledge and skills necessary to effectively implement high-quality standards, such as those outlined in CCSS.

Like other reform efforts, CCSS were implemented with the intention of improving student achievement and quality in education. However, there is a gap in the literature in regard to educators' knowledge and perceptions of CCSS. Given the level of impact that educators have on reform implementation, their knowledge and perceptions of these programs is critical to the successful implementation of reform efforts. We maintain that documentation of educators' knowledge and perceptions of CCSS is vital for determining the degree to which the initiative will fulfill the intended purpose of preparing students for college and the demands of a highly skilled and internationally competitive workforce.

Impact of Teacher Perceptions on Education Reform

Although reform efforts may be well intended and structured to enhance teacher effectiveness and increase student achievement, unfavorable assumptions in regard to their effectiveness can stifle implementation efforts (Mertler, 2010; Nadelson et al., 2012). The obstacles that confronted the implementation of Response-to-Intervention (RtI) and NCLB are illustrative (Bailey, 2010; Nadelson et al., 2012).

The goal and rationale of RtI is to ensure academic achievement for students who have traditionally under-performed by providing early, systematic academic and learning assistance, including alternate methods for identifying at-risk students, particularly those with learning disabilities (Swigard, 2009). According to Swigard, however, effective implementation of RtI came at an expense to teachers of time spent in training as well as additional responsibilities of the referral process. Swigard found a negative correlation between teachers' knowledge of RtI and their perceptions; that is, teachers with a low level of knowledge had positive perceptions of the benefits, and those with a high level of knowledge had negative perceptions. These results, according to the researcher, may be attributed to the overwhelming amount of training and work required to implement the RtI model. This was substantiated by Bailey (2010), who reported that many teachers cited the referral process as too time consuming. Bailey's research illuminates the critical

association between teacher knowledge and perception of reform efforts and the effective implementation of the effort.

Like RtI, NCLB also was met with skepticism. Initially, NCLB was praised for obligating states to develop measurable standards and forcing schools to be more accountable, especially with respect to the education of underserved populations (Reichbach, 2004; Rhodes, 2012). As NCLB was implemented, many educators became critical of the initiative due to their perceptions of an excessive emphasis on the associated assessments of student achievement (Murnane & Papay, 2010). Critics of NCLB have noted that the high-stakes assessment that accompanied the initiative were grounded in constrained beliefs about learning and measurement (Shepard, 2000) and served to narrow curricula to the fragments and facts required of achieving a passing scores on standardized tests (Hake, 2002). Many teachers reported feeling concerned about the time required for test preparation to ensure student success and the punitive impacts on schools when students performed poorly on standardized assessments (Murnane & Papay, 2010).

Although Mertler (2010) noted that NCLB offered educators opportunities to engage in conversations about student learning and teacher effectiveness, Nadelson et al. (2012) reported that teachers perceived the reform effort as stifling their creativity and autonomy. Further, the systems for rating schools on student test performance labeled so many schools as low performing that the criteria were rendered meaningless (Ayers & Owen, 2012). The inability of NCLB to reform education and the perceived lack of flexibility necessary for effective teaching and learning led many states (43 as of this writing) to request a reprieve from the central provisions in NCLB in the form of waivers from the federal government (Governing the States and Localities, 2012).

The concerns about the value of NCLB may be due to a combination of knowledge and perceptions of the reform effort. Notably, early and sustained documentation of educators' perceptions and knowledge of NCLB may have led to more effective and successful implementation of the initiative.

Impact of Teacher Knowledge on Educational Reform

Based on the intrinsic link between teacher knowledge and classroom practices (Cochran-Smith & Lytle, 2006), we posited that teacher knowledge of CCSS is likely an indicator of the extent and effectiveness of teacher implementation of standards. Our position is supported by scholars who contend that teacher knowledge plays a significant role in the implementation of educational reform efforts (Darling-Hammond, 1996,

1997, 2000; Darling-Hammond & Sykes, 1999). Craig (2006) argued that teachers are curriculum makers rather than curriculum implementers, and what teachers “think, say, and do informs their curriculum making and reveals their practical knowledge in action” (p. 3). Craig noted the tensions between teachers’ perspectives on the implementation of educational reform efforts and the expectations of reform promoting agencies. As Craig reported, teachers tended to focus on the quality of instruction and classroom interactions, while reform-promoting agencies tend to focus on the logistics of the implementation, such as the number of schools involved, stage of implementation, and fidelity of implementation. We argue that the differences in foci are likely due to variations in levels of knowledge of reform efforts. Thus, teacher knowledge of reform efforts, particularly the promoting agency’s reform effort policies and goals, are critical to assuring that teacher practice is aligned with the reform implementation.

Our search of the literature on teacher knowledge of reform efforts revealed a small number of qualitative studies that have examined teacher knowledge of RtI (Benjamin, 2011), NCLB (Reeder & Utley, 2008), and, more recently, CCSS (Kober & Rentner, 2012). Based on interviews of K-5 general education teachers in regard to RtI, Benjamin reported on teacher knowledge concerning their RtI practice rather than on the extent of teacher knowledge or understanding of RtI. Taking a different approach, Kober and Rentner (2012) investigated state-level efforts to implement CCSS as well as approaches for increasing teacher knowledge of CCSS through professional development, preparation, induction, and evaluation. Nevertheless, there are gaps in the literature with regard to the level of teacher knowledge and perceptions of CCSS. Thus, there is a need for further research on such knowledge and perceptions as a means to identify gaps in teacher understanding and areas of concern identified by the teachers that could be addressed in professional development.

Sweeping educational reforms require significant changes in the classroom for both teachers and students. Fuchs and Deshler (2007) identified a number of essential requirements for RtI reform initiatives, such as a sustained program of professional development, explicit specifications for program implementation, teacher buy-in, and an extended timescale of implementation, to enable teachers to integrate new practices, both personally and institutionally. We propose that these same requirements are important to the adoption of CCSS, especially because, historically, teachers’ knowledge of reform efforts have been constrained (Bailey, 2000).

Our study is a first step in addressing the gap in the literature in regard to teachers’ knowledge and perceptions of CCSS in relationship

to engagement in CCSS-related professional development and other parameters. We have gathered data that details what teachers think and know about the CCSS, which is critical for informing the formation of and offering support for structures necessary for the effective implementation of the reform effort.

Teacher Preparation for Reform Efforts

Educational reform efforts such as CCSS present teachers and districts with many challenges, including the realignment of their knowledge, beliefs, and practices to ensure that these new standards enhance student achievement (Borko, 2004). To address these challenges, government entities and educational policymakers have voiced their support for professional development opportunities that serve the critical function of enhancing teacher knowledge, skills, and beliefs in regard to accountability reforms (Hochberg & Desimone, 2010). Given the influence of professional development in preparing teachers for change (Hochberg & Desimone, 2010), we argue that perceptions and knowledge of CCSS are likely to be different for educators who have engaged in professional development that is focused on CCSS as compared to the situation of their peers who have not engaged in CCSS-focused professional development.

Research on reform efforts during the 1990s indicates that attendance at professional development workshops was associated with teacher self-reports of more reform-oriented practice (Cohen & Hill, 2000). Despite the large number of professional development opportunities available to teachers, however, the depth of these teacher-learning opportunities was “quite shallow” and provided very limited opportunities for changing knowledge and beliefs about reform (Cohen & Hill, 2000). More recent educational reform efforts, such as NCLB, have brought attention to the need for improved teaching quality through participation in professional development (Little, 1993). Although the NCLB required individual states to increase the knowledge and skills of all teachers to meet state and national standards through high-quality, research-based, professional development, it failed to specify the amount of time needed or the modality required to ensure that these provisions were met, nor did it specify how individual states should make these teacher preparation opportunities available (Borko, 2004).

Research indicates that the success or failure of a reform effort hinges on the knowledge and abilities of the educators tasked with its implementation (Phillips, Desimone, & Smith, 2011). The chasm between what the literature informs and the manner in which reform efforts

are implemented, however, remains wide. Most recently, the National Governors Association Center for Best Practices (2011) released an implementation guide to support the adoption of CCSS. While the guide recognizes that CCSS represent a substantial change for teachers and administrators, it offers scant guidance on how teachers should prepare for change. In its statement on the preparation and support of teachers and leaders, the National Governors Association Center for Best Practices (2011) proposed, "Ultimately, K-12 and postsecondary education leaders will have to work cooperatively to identify strategies to improve preparation and professional development of educators" (p. 10).

The dissemination of information on CCSS has largely been left up to the individual state departments of education. In addition, how teacher preparation and ongoing professional development offerings meet the CCSS is up to the universities, and how the CCSS is implemented has fallen on the shoulders school districts. All school districts throughout Idaho have been provided access to published criteria for adoption and best practices (Idaho State Department of Education, 2013). However, individual school districts have been tasked with interpreting these criteria and with providing the professional development and oversight required of the successful implementation of the standards. The provision of resources and professional development varies greatly across the state, and little, if anything, is known about how these efforts have influenced perceptions and knowledge of CCSS. Thus, one purpose of our study was to address the void in empirical evidence that documents teachers' perceptions and knowledge of CCSS and to offer insight into the degree that professional development is associated with teacher CCSS knowledge and perceptions.

Methods

As noted, our goal was to determine K-12 educators' knowledge and perceptions of CSS. We also sought to determine whether there were differences in K-12 educators' knowledge and perceptions of CCSS based on educational role and personal characteristics. Thus, we used the following research questions to guide our investigation:

1. What are K-12 educators' levels of knowledge of the Common Core State Standards?
2. What are K-12 educators' perceptions of the Common Core State Standards?
3. What are the variations in knowledge and perceptions based on educational role?

4. What are the variations in knowledge and perceptions based upon personal characteristics?
5. Where do educators go to find out more about Common Core State Standards, and what is their perceived quality of the source?

We anticipated that the participating K-12 educators would have limited knowledge and narrow perceptions of CCSS. Further, those who had attended structured professional development courses on CCSS would have greater knowledge and broader perceptions than would their peers who had not participated in professional development offerings. We also anticipated that there would be variations in knowledge and perceptions based on age, years of teaching, and school setting.

Participants

We invited approximately 2,500 educators to complete our survey and had just over 300 educators reply. The 323 teachers who participated in our research (i.e., completed or nearly completed our survey questionnaires) were drawn from a population of educators who have participated in science, technology, engineering, and mathematics (STEM) professional development programs in the region and from local school districts in a state in the Rocky of the United States. The teachers were, on average, 44.75 years old ($SD=10.32$) and had been teaching for an average of 16.36 years ($SD=9.48$). Females comprised 73% of the participants, and males, 27%. Caucasian non-Hispanics comprised 98% of the participants, with Asians and Hispanics nearly equally distributed across the remaining 2% of the participants. The educational background of the participants was distributed such that approximately 30% had bachelor degrees, 61% had master's-level degrees, 7% had educational specialist degrees, and 2% had doctorates. The majority of the participants were from urban settings (44%), followed closely by suburban settings (42%), while the remainder (14%) identified their community setting as rural. Fewer than half of the participants worked in a Title 1 classroom or school (41%). The average school size in which the educators worked was 820 students ($SD=667$). Our sample included 50% elementary teachers, 22% middle/junior high school teachers, 24% high school teachers, and 4% administrators. The participants indicated that they had engaged in an average of 27.5 hours ($SD=27.20$) of professional development in the last year, with a range of 0 to 200 hours. The participants also indicated that they had engaged in an average of 10.95 hours ($SD=16.32$) focused on CCSS, with a range of 0 to 180 hours. The participants reported an average political orientation of 5.44 ($SD=2.44$) on a 10-point scale, which we interpreted to be in the middle of the political spectrum.

Instruments

Demographics. We developed a demographic survey that included the standard items of age, highest degree attained, years of teaching, current employment position, and sex. We included items to determine engagement in and nature of CCSS professional development. We also included an item that asked participants to rate their political orientation on a scale of 1 (liberal) to 10 (conservative). We asked the political orientation question to determine whether perceptions of CCSS might be related to political perspective.

Perceptions and knowledge of CCSS. We developed our instrument to assess our participants' knowledge and perceptions of CCSS based on our research goals. Although we attempted to find extant instruments on teacher perceptions and knowledge of other reform efforts, our search was not fruitful. We determined that the current expectations and publicity surrounding CCSS provided a good foundation for drafting a meaningful instrument.

We generated the items for our instrument based on the CCSS documents published by National Governors Association Center for Best Practices (2012). We reviewed the documents that described the standards and the associated supporting literature and sought key points in regard to the initiative. Once we compiled the key elements of CCSS, we transformed the statements into Likert-scale items. For example, the CCSS document states, "The standards are evidence based," which we used to create the item that stated, "The CCSS are research based." We consider this a knowledge subscale item. Our perception subscale included items such as, "I am NOT eager to apply CCSS" and "CCSS will NOT improve student learning."

Our final instrument included a mixture of forward- and reverse-phrased items that were designed to measure both understanding and perceptions of CCSS. Once created, we vetted our instrument with faculty, with a focus on English language arts literacy and mathematics in a college of education. We also vetted the instrument with several K–12 educators and asked them to provide us with feedback on the content and focus on the instrument. Based on their feedback, we made minor changes to our survey questionnaire. The changes were to the language of the survey questionnaire for clarification, and not to the content, which indicates that we had established appropriate content and construct validity.

Data Collection

All data collection took place online using SurveyMonkey^R as a

delivery mechanism. Our sample was one of convenience, drawn from educators who had participated in a statewide STEM professional development program (not focused on CCSS) and from a large school district (over 2,000 educators) in the region. We recruited participants by emailing them an invitation that invited them to participate in our study. The email invitation included a brief overview of our research, contact information to obtain more information, and a link to our survey questionnaires. In all, we invited approximately 2,500 educators to participate in our project.

Results

We began our analysis by conditioning our data. We forward-coded the reverse-coded items, and used the mean replacement feature in SPSS to compute values for the unanswered items for the less than 5% of the participants who has completed at least 90% of the survey questionnaire but left at least one item blank. We then calculated our instrument reliability, which yielded a Cronbach's alpha of .93, which indicated a very high level of consistency. Based on the reliability value, we determined that we could progress with the analysis of our participants' responses without further need to examine or condition our data.

Knowledge of CCSS

The first research question was, "What are K–12 educators' levels of knowledge of the Common Core State Standards?" To answer this question, we calculated an average composite score using the CCSS knowledge question in our survey questionnaire. Our analysis revealed a score of 3.57 ($SD=.49$), which we interpreted to be a moderate level of knowledge, based on our 5-point Likert scale. We did, however, find some variation in responses to specific items (see Table 1). The group of lower-scoring items is associated with student performance and achievement, while the higher-scoring items were primarily associated with implementation and learning expectations. There was some crossover, however, between these general categories. For example, the low-scoring group included an item that corresponded to the revisions of the CCSS (Item 11). It is important to note again that the content of the items in our survey questionnaire was directly drawn from CCSS documents.

Perceptions of CCSS

The second research question was, "What are K–12 educators' perceptions of the Common Core State Standards?" We used a method similar

to our approach to the knowledge question and created a composite score of the perception items of our survey. Our analysis revealed a composite average of 3.43 ($SD=.67$), which we interpreted to be slightly higher than moderate. Our item analysis again revealed some variations in average, with some items scoring lower and some higher than the composite average (see Table 2). The lowest-scoring items, which we

Table 1
Means and Standard Deviations
for the Low- and High-scoring Knowledge of CCSS Items

Item	<i>M (SD)</i>
<i>Low-scoring</i>	
18. The CCSS are aligned with college expectations.	3.08 (1.00)
11. The CCSS have been published and are, therefore, no longer subject to revision.	3.12 (0.95)
9. The CCSS are based on key knowledge and skills.	3.18 (0.96)
20. The federal government is involved in the implementation of the CCSS.	3.18 (0.98)
24. The learning progressions of the CCSS will improve student learning.	3.34 (1.12)
<i>High-scoring</i>	
30. The CCSS do NOT set clear and realistic goals for learning.	3.81 (0.78)
5. The CCSS will provide greater content depth.	3.82 (0.98)
4. The CCSS will create common learning expectations for students across states.	3.93 (0.88)
15. CCSS will NOT increase the United States' global competitiveness.	3.90 (0.88)
16. The CCSS will encourage student application of knowledge.	3.94 (0.85)

Table 2
Means and Standard Deviations
for the Low- and High-scoring Perceptions of CCSS Items

Item	<i>M (S)</i>
<i>Low-scoring</i>	
22. I do NOT feel well prepared to teach the CCSS curriculum.	2.68 (1.12)
19. CCSS are NOT easy to understand.	2.95 (0.91)
<i>High-scoring</i>	
1. CCSS represent a significant change from current Idaho state standards.	3.82 (0.99)
30. CCSS do NOT set clear and realistic goals for learning.	3.81 (0.88)
23. CCSS will NOT improve student learning.	3.80 (0.79)

interpreted to be on the lower side of moderate, were associated with preparation to teach the CCSS and the understandability of the CCSS. The higher-scoring items were associated with change in standards and the associated improvement in student learning.

Variations Due to Role

The third research question was, “What are the variations in knowledge and perceptions based on educational role?” To answer this question, we conducted an ANOVA, using educational role as the factor and the composite scores of perception and knowledge as the dependent variable. The role in school factor included teacher, department chair, and administrator. Our analysis revealed no differences for an overall measure of CCSS, perceptions of CCSS, or knowledge of CCSS. These results indicate consistency in perceptions and knowledge of the CCSS, regardless of educational role.

Variations Due to Personal Characteristics

The fourth research question was, “What are the variations in knowledge and perceptions based upon personal characteristics?” To answer this question, we calculated the correlations between perceptions and knowledge of CCSS with personal characteristics, such as years of teaching, age, school size, political orientation, and hours of professional development focused on CCSS. Our analysis revealed that only hours of professional development was correlated with knowledge ($r=.18, p<.01$) and perceptions ($r=.15, p<.01$) of CCSS. The relationship suggests that, as hours of CCSS-focused professional development increases, so do perceptions and knowledge of CCSS.

Sources and Perceived Quality of Sources with Regard to CCSS Information

The fifth research question was, “Where do educators go to find out more about CCSS, and what is their perceived quality of the source?” To answer this question, we examined the percentages and frequencies of our participants’ responses to the items that asked them to share where they would go for CCSS information (see Table 3) and to share which source provides the best-quality information (see Table 4).

It is apparent that school districts play a significant role in both providing CCSS information and being a source of quality CCSS information. Our participants indicated that they would go to the Internet slightly more than to school districts but then rated the quality of the information

about CCSS they might get from the Internet as substantially lower. Professional journals, professional organizations, principals, and the state departments of education were relatively the same in terms of sources, but principals dropped noticeably in the quality responses. Lowest in terms of source and quality were newspapers and college of education.

Discussion

The goal of our research was to gain a greater understanding of K–12 educators' perceptions and knowledge of CCSS. Studies of educators' knowledge and perceptions of reform efforts are rare, yet, as we have argued, educator knowledge and perceptions of reform initiatives are critical indicators of the potential success and effectiveness of reform effort implementations.

Table 3
Frequencies and Percentages
for Where Participants Would Go for CCSS Information

Source of Information	<i>n</i>	%
Journals	76	32.1%
Professional Organizations	92	38.8%
State Department of Education	110	46.4%
School District	160	67.5%
Principal	76	32.1%
Newspaper	5	2.1%
Internet	168	70.9%
Colleges of Education	29	12.2%
Other	44	need %

Table 4
Frequencies and Percentages for Sources that
Participants Believe Provide the Best Quality CCSS Information

Source of Information	<i>n</i>	%
Journals	47	21.7%
Professional Organizations	70	32.3%
State Department of Education	65	30.0%
School District	118	54.4%
Principal	38	17.5%
Newspaper	0	0.0%
Internet	87	40.1%
Colleges of Education	24	11.1%
Other	40	need %

Our research demonstrated that our K-12 participants held moderate levels of knowledge and perceptions of CCSS. Given the relatively recent adoption of CCSS, it is not surprising that K-12 educators may not have well-developed knowledge of the standards. Further, there are potentially multiple interpretations of CCSS documents, including the potential for conflation of CCSS with elements of NCLB. We also have evidence to indicate that, as professional development in CCSS increases, so do knowledge and perceptions of the CCSS. Our findings, which linked knowledge and perceptions of the CCSS to CCSS-focused professional development, suggest that, over time, and as more CCSS professional development is provided, we are likely to see continued increases in understanding of and opinions about CCSS. A longitudinal study of the levels of K-12 educators' knowledge and perceptions of CCSS with respect to their engagement in CCSS professional development is an excellent direction for future research.

We had anticipated that the roles of educators would likely influence their knowledge and perceptions of the CCSS through our assumption that department chairs and administrators would need to hold deeper knowledge and more positive perceptions of CCSS due to their leadership roles. Our data, however, failed to show such differences due to educational role. However, we have provided evidence to suggest that all educators are at relatively the same level of knowledge and perceptions regardless of their role, which suggests that role is not necessarily associated with familiarity with the CCSS but, rather, is more likely related to other variables, such as CCSS-focused professional development.

We were intrigued by our findings of where our participants indicated they would go for information about CCSS and their rankings of the associated quality of the sources of information. While teachers viewed school districts as a good source of information, their view of principals, who are part of that leadership, was inconsistent with these perceptions; in general, teachers did not view principals as a reliable source of CCSS information. We speculate that district level curriculum leaders, or mathematics or English language arts specialists, who are likely to be better versed in CCSS, served as teachers' sources of information. Identifying whom teachers contact for information about reform efforts, such as CCSS, in their school districts and what information they seek when they make the contact is an excellent direction for future research. The Internet's being rated highly as a source of information is relatively easy to explain, as it is convenient, and there is an abundance of CCSS information on the Internet that is potentially highly beneficial. Similarly, the low rating of the Internet as a quality source is reflective of the nature of the Internet; that is, although the Internet may be a source of

high-quality information, it also contains opinions, ideas, and potentially inaccurate information. The need to filter fact- and evidence-based information from opinions and ideas is certainly a viable explanation for the lower quality rating.

The relatively very low ranking of colleges of education as either sources of information or sources of quality CCSS information was unexpected. Because colleges of education are thought to be on the cutting edge of educational reform, we felt that educators might rely heavily on these sources and find them to be of high quality. The low ranking may be due to a lack of access by teachers to a college of education or a lack of established relationships with a college of education. However, it also may be possible that educators perceive colleges of education as being out of touch with the CCSS initiative. Further, there may not be professional development or other related CCSS activities being offered by colleges of education that are reaching the teachers who participated in our research. Why educators do not perceive college of education as sources of CCSS information and perceive them as providing low-quality CCSS information is a line of research worth further exploration.

Implications

Our research has illuminated the potential importance of determining educators' knowledge and perceptions of educational reform efforts as key to the implementation of new educational initiatives. Low knowledge or negative perceptions could certainly interfere with effective implementation, and, likely, high knowledge and positive perceptions could increase the effectiveness of reform implementation.

The link between hours of professional development in CCSS and knowledge and perceptions of CCSS suggests that more CCSS professional development is likely to increase knowledge of CCSS and lead to more positive perceptions. Therefore, it is important to engage educators in professional development associated with reform efforts as a means of increasing their knowledge and perceptions of the effort.

We found that educators tend to seek CCSS information from the Internet and district-level sources at a much greater rate than that for other possible sources of information. Given this situation, it may be important to ensure that educators know whom to contact or where on the Internet to go to obtain quality CCSS information. Our results also suggest that faculty and leadership in colleges of education may need to be more proactive in promoting themselves as approachable sources of quality CCSS information.

Limitations

The first limitation of our study was the sampling. We invited approximately 2,500 educators to complete our survey and had just over 300 educators reply. Although our sample was relatively large, it is possible that it was not representative of the larger education community, even though our demographics seem to reflect the larger education community. To determine the applicability of this research to the larger educational community, conducting this study in another location or with a larger number of participants may be necessary.

The second limitation of our study was the nature of the data that we collected. We sought to determine knowledge and perceptions of the CCSS. However, from our research, we cannot associate these data to actual implementation of the CCSS curriculum. That is, we do not have evidence that links level of knowledge or perceptions to actual teaching according to the CCSS. Further, it is important to note that school districts are likely in various stages of CCSS adoption, which is likely to influence teachers' engagement and implementation of the CCSS. Determining how CCSS knowledge and perceptions are related to district implementation and the corresponding practices of the teachers are excellent topics for future research.

Our final limitation is our methods, as self-report may not result in data consistent with the content. It may be possible that educators' perceptions and knowledge are greater or more constrained than we were able to capture. Combining our survey research with other methods of gathering educators' perceptions and knowledge of CCSS is a potentially fruitful direction for future research and likely needed to validate our findings.

Conclusion

As new reform efforts, such as CCSS, are introduced, it is important to determine the levels of knowledge and perceptions of those responsible for implementing the initiatives. Reports on knowledge and perceptions of reform efforts are unique and suggest that more research may be needed in this area of education. Our study addressed this gap and found that moderate levels of CCSS perceptions and knowledge are related to professional development. Although the link between perceptions and knowledge of CCSS to professional development may seem obvious, we were not able to find similar reports in the literature, which further justifies the importance and contribution of our research. We anticipate that our research will be useful in informing future research on reform efforts, and we look forward to continued investigation of the issues and

variables associated with the implementation of educational reform initiatives.

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