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Teacher Educators' Beliefs, Self-Efficacy, and Perceptions Related to Dyslexia: Phase I

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Cover Page Footnote

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Teacher Educators' Beliefs, Self-Efficacy, and Perceptions: Phase I

Higher education preparation programs are held to accreditation standards from various independent institutions. Accreditation bodies employ sound methodologies to assure the quality of education and services provided to future teachers (i.e., CAEP), even if a few may be perceived as somewhat limited in objectivity (i.e., NCTQ). However, the credibility of teacher preparation reading and literacy programs has received increased criticism and calls for changes to be implemented through state legislation. Accusations by dyslexia advocates and a faction of scholars have picked up momentum in recent years. They are concerned with a lack of science within reading instruction and have thus coined the term science of reading (SOR). Their claims underline the incompetence and negligence of reading and literacy programs to prepare pre-service teachers to teach reading who have ignored the scientific approach for reading instruction through the Simple View of Reading (SVR; Gough & Tunmer, 1986). This is the dominant model found in most professional development and various structured literacy programs, even though it has been updated (see Hoover & Gough 1990; Hoover & Tunmer, 2018; Hoover & Tunmer, 2021). While the SVR is a valuable and established model, it is not the only one used for reading instruction, especially when the entire body of reading research from across several decades is considered and given the diverse population of learners for whom it is intended.

Teacher preparation programs prepare pre-service teachers to utilize assessment data and provide instruction that targets the unique reader profiles through various models, including but not limited to the SVR. Their input and expertise is a valuable contribution to emerging policy, curriculum, and advocacy changes. The voices of dyslexia advocates are clearly heard in the evidence of state legislation that continues to grow, yet the voices of teacher educators continue to be silenced.

We adopted the perspective in this study that there are multiple understandings of any phenomena and knowledge is socially constructed by individuals and their multiple social realities (Charmaz, 2000). Our research was informed by the previous work of Worthy and colleagues (2018a) and their use of Bakhtin's (1981, 1986) conception of competing discourses as a theoretical frame to analyze current dyslexia legislation and teacher educators interview responses (Worthy et al., 2017; Worthy et al., 2018a). As noted by Worthy et al., (2018a), the current dyslexia legislation and surrounding discourse is full of Bakhtin's notion of authoritative discourse (AD) that promotes one right way versus allows for multiple interpretations of the same concept.

Conducted in two phases, the study included a survey and individual interviews with teacher educators in higher education institutions in four midwest states. The survey, Phase I, sought to find out the general knowledge of teacher educators about their (a) *beliefs* about dyslexia; (b) *self-efficacy* for working with students with dyslexia and other reading challenges; and (c) *perceptions* about the extent to which their teacher educator program prepares K-12 teachers to work with students with dyslexia and is aligned with current dyslexia legislation. In Phase II (Howe & Roop, 2022) we employed one-on-one semi-structured interviews (Merriam, 2001) to keep with the above noted perspective and to best capture multiple interpretations and perspectives of the teacher educators.

The Dyslexia Definition to Drive Educational Reform

While there are various definitions for dyslexia, common characteristics exist for this reading disability. The research on reading instruction and dyslexia has suggestions for implementation in the classroom where a wide range of reading abilities are present. What is still unknown, or unclear, is how the language in the legislation includes a broad base from the literature on reading for assessment and instruction that supports all reading difficulties and range of abilities.

Dyslexia Definitions

How is dyslexia defined and how prevalent is it? Peterson and Pennington (2012) suggest that prevalence is dependent on the definition of dyslexia. There are several definitions presented in this section that show the similarities in characteristics and some nuances related to dyslexia.

A common misconception of dyslexia is that it involves seeing letters backwards. This myth is certainly dispelled by research as dyslexia is a neurologically-based, phonological processing deficit (IDA, 2022; NICHD, 2022) and categorized as a learning disability (Elliot, 2020; Lee, 2014-2022). Dyslexia can be *acquired*, typically associated with a literate person who experiences brain damage, or *developmental*, when a child experiences challenges with learning to read (Seidenberg, 2017); the definition of dyslexia relative to education is predominantly concerned with the latter. Dyslexia, as defined by the International Dyslexia Association (IDA) is,

> [A] specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge. (2022)

Kilpatrick (2016) states that dyslexia is based on the phonological core deficit and defines it as "poor word-level skills despite adequate effort, learning opportunities, and normal language skills." (p. 9) Hruby (2009) further describes several types of dyslexia, with various degrees for some types over time, such as acquired (e.g., due to brain injury), developmental (e.g., difficulties with word recognition despite effective instruction), "phonological or deep dyslexia" (e.g., inability to rapidly connect sounds to letters), and surface dyslexia (e.g., "inability to identify word forms") (p. 4). In addition, a misdiagnosis is possible that Hruby refers to as pseudo dyslexic. This label is used for a particular subcategory of readers when development is within the normal distribution of variance in the population and the lack of effective early reading instruction is not factored. Based on fMRI images, Hruby refers to dyslexia as a genetic disorder that:

> disrupt[s] the development of neural circuitry in the brain areas typically recruited during efficient reading development. Disparities in activation of gross areas of brain anatomy, as indicated by fMRI, cannot distinguish such abnormal cell structures. Moreover, given the molecular- and cellular level source of the problem, the atypical activation of gross

> brain anatomy identified in brain scans is often only a symptomatic, not a causal, indicator of the disorder. (p. 5)

Besides family history or genetics, Thompson et al. (2015) identify dyslexia as an outcome based on multiple risk factors detectable at school age such as difficulty with phonological awareness, letter knowledge, and Random Automatized Naming (RAN). In addition, reading can also be affected by other learning disabilities (Peterson & Pennington, 2012)

In line with the neurological nature of dyslexia, Peterson and Pennington (2012) add that it is a neurodevelopmental disorder that results in "slow and inaccurate word recognition" (p. 1997)—a combination of the neurobiological descriptions reviewed (IDA, 2022) along with the developmental aspect described by Hruby (2009), characterized by difficulties with word recognition (Kilpatrick, 2016). Peterson and Pennington (2012) note that, *"*[f]rom a neuropsychological perspective, the phonological theory remains the most compelling, although phonological problems also interact with other cognitive risk factors. Studies accounting for reading experience demonstrate that many recorded neural differences show causes rather than effects of dyslexia" (Peterson & Pennington, 2012, p.1997) The accurate early diagnosis of dyslexia is difficult given the similarities and differences provided by the contributing factors of developmental dyslexia (i.e., neurological, family, genetic, environmental, co-occuring disabilities) (Snowling et al., 2003).

Elliot (2020) describes four types of dyslexia diagnosis. The first type is synonymous with reading disability, specifically difficulties in word reading or decoding; however, this is difficult because "reading skills are distributed normally in the population with no clear boundary between normal and disabled reading performance" (p. 2). Another diagnosis can be found within a "clinically derived subgroup of poor readers" (p. 2), the difficulty with which is the identification or distinction of such individuals from within the larger population of those who struggle with decoding. It is not clear if the neurobiology component exclusively provides the basis for diagnosis or predictive value due to other factors such as environment and biological factors that make it difficult to clinically distinguish dyslexia from "other decoding difficulties" (p.3). Phonological deficits are an underlying factor but not the only one that can determine dyslexia is present. In addition, IQ and cognitive measures should not be used to diagnose dyslexia and a concern for equity is present given that environmental and economic factors may force a subjective perception of a student's reading abilities. Elliot adds that ineffective instruction is not the only factor, and most students will learn to read regardless of approach, but at-risk readers will need evidence-based, structured and systematic instruction. Secondary effects of reading disability, such as vocabulary and background knowledge, contribute to poor performance and affect comprehension; "[h]owever, the presence of such problems cannot enable clinicians to differentiate between dyslexic and other poor decoders; such difficulties are typically found, in differing ways and combinations, in poor readers generally." (p. 3). Elliot further explains a third type of dyslexia diagnosis made on a "post hoc" evaluation of the student's lack of progress and persistent difficulties despite a high-quality, evidence-based instructional intervention. A fourth type of dyslexia diagnosis, as described by Elliot, is a neurodiverse profile dyslexia diagnosis which goes beyond reading difficulties and includes the role of working memory, processing, attention, self-organization, oral expression, concentration, and a gifted profile.

Consensus across fields does exist for specific characteristics of dyslexia, such as difficulty with accurate and fluent decoding as a result of phonological processing issues

(Bradley & Bryant, 1983; Elliott & Grigorenko, 2014; Vellutino et al., 2004; Peterson & Pennington, 2012; Kilpatrick, 2016; IDA, 2022; NICHD, 2022). Dyslexia is not a visual issue and reversals are typical of developing readers (Vellutino et al., 2004; Hruby, 2009; Elliott & Grigorenko, 2014). It is not a disease that someone does or does not have (Worthy et al., 2016). However, the accurate diagnosis of dyslexia is difficult as there is no clearly established criteria or cut-off point that distinguishes dyslexia from other reading difficulties (Snowling et al., 2003; Perterson & Pennington, 2012; Elliot 2020). Decoding issues with dyslexia may coexist with word retrieval and spelling challenges that may lead to problems with comprehension, written expression, vocabulary development, and motivation (Velluntino et al., 2004; Shaywitz et al., 2008; Elliot 2020). Studies do not exist that point to unique characteristics in spelling, reading, or brain structure that are unique to dyslexia from other decoding challenges (Cassar et al., 2005; Ramus & Szenkovits, 2008; Tanaka et al., 2011)

The accurate diagnosis of dyslexia is dependent on the common characteristics within the definitions. However, the lack of consensus on what differentiates dyslexia from other reading difficulties or contributing factors (i.e., other learning disabilities) is unclear. The definition used in the legislation includes and refers to the IDA (2022) definition, although it appears to be vague and not particularly useful. Many definitions exist but there is no consensus on one definition across all fields, as suggested by use of IDA's definition within recent legislation. This confusion poses implications for assessment and instruction in the classroom setting[1].

Assessment and Instruction to Meet the Challenges of Dyslexia

Advocates claim that teachers are not equipped by their preparation program to adequately and effectively teach reading and that the SOR is the new approach that must be embraced by all teachers and teacher educators. These claims are misinformed. Instruction for reading, when driven by assessments data, allows teachers to identify the strengths and needs of the learner. Assessment data provides a pathway to appropriate instruction to target specific components and skills for reading. The National Reading Panel (NRP; 2000) identified five components that are critical for instruction aimed at developing skilled readers: phonemic awareness, phonics, [reading] fluency, vocabulary, and [reading] comprehension. The report compiled by the NRP, a selected number of "leading scientists in reading research, representatives of colleges of education, reading teachers, educational administrators, and parents" (p. 1-1), considered research on reading prior to 1966 with over 15,000 studies and since 1966 with over 100,000 studies. The methodology for review of this research consisted of a "comprehensive, formal, evidence-based analyses of the experimental and quasi-experimental research literature relevant to a set of selected topics judged to be of central importance in teaching children to read" (p. 1-1).

Deficits, in any of these areas reported by the NRP, can be identified through screening assessments given to all students. Screening assessments, also referred to as universal screeners, determine if students perform at benchmark or on grade level. If students fall below a predetermined score on a screening assessment, further diagnostic evaluation is needed in order to detect deficient subordinate skills, such as those foundational to word recognition (phonemic

[1] It is important to differentiate between a classroom and clinical setting when gathering evidence for effectiveness of instruction. Variabilities in the two settings should be considered when replicating a specific approach and drawing conclusions about its effectiveness or lack of.

awareness, phonics, fluency) and meaning-making (fluency, vocabulary, comprehension). This process is descriptive of the Multi-Tiered Systems of Support (MTSS) that addresses academic and behavior needs, which is " a set of evidence-based practices implemented across a system to meet the needs of all learners" (KS MTSS, 2019, p. 1). Derived from the Response to Intervention (RTI) model for academic needs, MTSS implementation provides for a systematic approach of instructional methods supported by research. MTSS allows for early identification and intervention for reading difficulties through the application of targeted (Tier 2) or intensive (Tier 3) evidence-based instruction. Adjustments to instruction are based on data from continuous progress monitoring and tailored to student's needs (KS MTSS, 2019).

As seen in the previous section, difficulties in accurate word decoding as a result of phonological processing is a deficit that is described in all forms of the definitions for dyslexia. Contrary to the claims that teachers are not prepared to teach reading, current instructional practices, adhere to the NRP results, and follow an MTSS model, are recommended and implemented in order to address phonological awareness and phonemic awareness, and phonics to build the accurate and automatic word recognition needed for reading fluency[2].

These pillars for reading instruction and the process of assessment have been in place for years, preceded the contemporary term "science of reading," and were simply referred to as "reading." Additionally, over two decades ago the NRP (2000) report shared the points listed below from their meta analysis of an existing body of research for phonological awareness, phonemic awareness, and phonics that is still relevant today:

- Phonemic awareness includes important skills that transfer from the ability to manipulate sounds in speech to learning to read and spell and for reading comprehension (p. 2-40).
- Phonemic awareness instruction supports students reading development in grades Pre-K - 1, including students at-risk for reading difficulties, and students identified with reading disabilities[3], students from various SES levels, and ELL students (p. 2-41).
- Phonemic awareness is more effectively taught with letters, as opposed to without letters and in small groups (pp.2-41-42).
- Phonics instruction is significant for reading growth.
- Systematic phonics instruction, regardless of use of a synthetic or analytic approach, is most effective. (p. 2-131). Systematic phonics instruction includes explicit teaching of letter-sound relationships and students reading text (i.e., decodables) that provides practice "using these relations to decode words" (p. 2-132).
- Systematic phonics instruction is effective when taught in different formats: tutoring, small groups, and whole group (class) (p. 2-132). Programs that offer a systematic phonics instruction curriculum "do not appear to differ significantly from each other in their effectiveness" (p. 2-132).
- Systematic phonics instruction is significantly more effective than instruction that does not include phonics instruction (e.g., non-phonics programs, basal programs, whole language approaches, and whole word programs) to prevent and remediate reading

[2] One facet to reading fluency is that it supports reading comprehension. This is explained by the theory of automatic information processing in reading (LaBerge & Samuels, 1974) that states when words are recognized automatically, there is more cognitive energy available for comprehension to occur.

[3] Dyslexia is currently identified as a learning disability and referred to as such in some definitions (Snowling et al., 2003; Peterson & Pennington, 2012). Dyslexia is considered a specific learning disability (SLD) category under the thirteen Individuals with Disabilities Education Act (IDEA) disabilities categories (Lee, 2014-2022).

difficulties for students at-risk and students with reading disabilities, regardless of SES status (p. 2-133). It also aids reading comprehension for younger students and students with reading disabilities. (p. 2-133). The report did not conclude on instruction for low-achieving students "because it is unclear why systematic phonics instruction produced little growth in their reading and whether the finding is even reliable" (p. 2-133).[4]

- Phonics instruction is more effective when implemented prior to and including 1st grade. Beginning in kindergarten, the scope and sequence should focus on "foundational knowledge involving letters and phonemic awareness" (p. 2-133).
- The NRP report emphasized integration of systematic phonics instruction with other reading instruction "to create a balanced reading program. Phonics instruction is never a total reading program" (p. 2-136).

However, lack of consensus across the research on dyslexia and how to address it in instruction show that there is no agreed upon way to identify dyslexia, as seen with Elliot's (2020) discussion on four different ways to identify dyslexia. Current practices vary and validity and reliability issues exist with many measures currently used (Elliott & Grigorenko, 2014; Harry & Klingner, 2007). There is no definitive research base to support one best method to teach reading to students identified with dyslexia (Johnson, 2011; Shaywitz et al., 2008). What is known are the five components of reading instruction as outlined within the NRP Report and widely accepted use of MTSS or RtI models for targeted instruction based on student needs and continuous progress monitoring. Regardless of how the terminology is branded within the recent legislation (i.e, reading versus science of reading) and the narrative that surrounds it, critical elements necessary for effective reading assessment and instruction are not new as evidenced from the findings in the NRP report (2000).

The century-plus base of reading research has and will continue to grow and evolve. Science extends knowledge rather than settles it. While research continues to advance what is known about reading, or the science of reading, policy that dictates reading instruction and assessment is more limited. Therefore, it is essential that policy can be accurately contextualized with consideration of the entire research base and not just a narrow slice. Given the breadth and depth of knowledge and experiences of literacy teacher educators and their role training K-12 teachers on how to work with students with reading challenges, teacher educators are well equipped and positioned to be the bridge that connects reading policy initiatives, research, and practice. This ability to contextualize policy within the whole versus a slice of the current research base is what is needed to achieve the intended goals.

Legislative Advocacy for Dyslexia

In order to understand how the missing voices of teacher educators can assist with the shared goal of all students learning to read, more studies are needed (see Worthy et al., 2018 a; Worthy et al., 2018b; Worthy et al., 2018c). These studies also address the misinformed claims and the current narrative that K-12 teachers do not know how to address dyslexia because they

[4] Duke & Cartwright's (2020) Active View of Reading proposes that "the reader brings unique levels of motivation and engagement, executive functioning skills, and strategy use that impact word recognition and language comprehension. In addition, this model includes cultural and other content knowledge, reading-specific background knowledge, verbal reasoning, language structure, and theory of mind as part of the language comprehension construct (Roop & Howe, 2021).

are not taught in teacher preparation programs. Presently, every state has dyslexia legislation that addresses its identification, remediation, and best practices, and Virginia alone has 46 dyslexia related bills in progress (IDA, 2022). In the region where our study was conducted, Iowa has eight bills, Kansas has six, Missouri has 18, and Nebraska has six--a combined total of 38 bills. There are three related to dyslexia that have passed at the federal level (IDA, 2022). Legislation is enacted across multiple states that is based on a narrative and research claims that are not actually supported by a larger synthesis of research. Such legislation positions dyslexia as a prevalent reading issue and calls for changes in teacher preparation programs related to the identification, instruction, and screening for dyslexia. Terminology such as "science of reading" and "evidence based" is used in the language intended for classroom instruction and intervention. The language is reflective of the recent publication by The Reading League (2022),

> The science of reading is a vast, interdisciplinary body of scientifically-based* research about reading and issues related to reading and writing.
> This research has been conducted over the last five decades across the world, and it is derived from thousands of studies conducted in multiple languages. The science of reading has culminated in a preponderance of evidence to inform how proficient reading and writing develop; why some have difficulty; and how we can most effectively assess and teach and, therefore, improve student outcomes through prevention of and intervention for reading difficulties.

The Reading League (2022) uses "scientifically based" as a descriptor to explain causal relationships within experimental or quasi-experimental design research. Additionally, they note that "other methodologies (e.g., qualitative studies, brain imaging studies, correlational studies, observational studies, meta-analyses) are useful when the research questions are not seeking to address causal claims" (p. 10). The instructional recommendations for reading are grounded in the Simple View of Reading (Gough & Tunmer, 1986[5]) and as illustrated by Scarborough's Reading Rope (Scarborough, 2001). Multi-Tiered Systems of Support (MTSS) is the recommended framework for interventions that provides instruction based on screening, diagnostic, and progress monitoring data. This is a stark similarity to the NRP (2000) methodology and recommendations in place for over twenty years. Yet, the language in the legislation includes a narrow definition of the science of reading as indisputable proof for the use of only one approach to reading instruction – a structured literacy approach with over-emphasis on decoding—as backed by one model of reading, The Simple View (Gough & Tumner, 1986). This is a problem because to put pressure on K-12 schools and higher education teacher educators to comply with legislation promoted under the guise of settled science, with research-proof that does not actually align with the larger body of research (i.e., NRP, 2000) for literacy instruction, may have unintended consequences for students and parents who want help for their children. Worthy et al., (2017) explain that recent dyslexia legislation and SOR movement is promoted by a powerful narrative that is based on a concept defined by Bakhtin (1981, 1986) as authoritative discourse (AD). When competing discourses exist, as they often do, AD excludes the consideration of multiple perspectives and understandings. This discourse labels teacher

[5] The original Simple View of Reading (SVR, Gough & Tunmer, 1986) was further discussed and updated in Hoover & Gough 1990; Hoover & Tunmer, 2018; Hoover & Tunmer, 2021. However, these later extensions and explanations of the SVR are not referred to in the science of reading materials and publications.

educators and others who do not engage in the same discourse as the ones outside of what Worthy et al. (2017) describes as a "closed circle" of dyslexia "experts."

This section previewed the definitions for dyslexia, instructional practices for students with reading difficulties and reading disabilities such as dyslexia, and established and draft dyslexia legislation. There are agreed upon characteristics for dyslexia in the scholarly community, along with recommendations and discrepancies to make a diagnosis that distinguishes struggling readers from those with dyslexia. The body of research that guides reading instruction and assessment, known as research on reading, currently called the science of reading, echoes the present calls for action to include phonological and phonemic awareness, and systematic (explicit) phonics instruction. Action calls for the implementation for interventions and remediation for students at-risk and with dyslexia within the MTSS framework, parallel the current practice. The transition from *reading* to *science of reading* appears to be in the use of terminology; legislative changes appear to reflect these in response to advocates and specific fields outside of education, who have undoubtedly contributed to the field of reading, or science of reading. However, it is unclear to what extent and if contributions from teachers and teacher educators are considered when legislation is drafted and enacted. Legislation did not include the voices of teacher educators and makes unsupported claims about their knowledge and beliefs related to reading instruction and students identified with dyslexia. This study seeks to include the voices of teacher educators and learn from their beliefs and perceptions about dyslexia and dyslexia legislation and better inform the intended goals of the current mandates.

Methodology

The study included two phases, Phase I and Phase II (Howe & Roop, 2022) , informed by previous research conducted by Worthy and colleagues(2018a) conducted with teachers and teacher educators. This manuscript discusses Phase I only. Phase I consisted of a survey sent to education departments in public and private universities of various sizes and geographic locations in Iowa (IA), Kansas (KS), Missouri (MO), and Nebraska (NE), specifically focused on those teaching reading or literacy in the department. The survey in Phase I utilized non-probability, convenience sampling. The first phase included a survey with questions organized around beliefs, efficacy, and perceptions about dyslexia and dyslexia legislation, in order to hear from these educators who are immersed in the theoretical and practical aspect of unpacking the complexity of reading.

Phase II of this study involved intensive follow up one-on-one semistructured interviews with purposefully selected participants from Phase I. Interview responses were qualitatively analyzed using a priori and inductive analysis. Three major themes emerged. The remainder of this article pertains to Phase I only.

Phase I

A survey was sent to participants in an email. The survey consisted of three sections: beliefs, self-efficacy, and perceptions. Each of these three sections had ten questions for a total of 30 questions with response choices on a 5-point Likert scale: *1 strongly disagree*, 2 *somewhat disagree*, 3 *neither agree nor disagree*, 4 *somewhat agree*, and 5 *strongly agree*. One additional item that prompted a free verse response was added to the sections that pertain to beliefs and self-efficacy; two additional items that prompted a free verse response were added to the

perception section. Weekly reminders were sent via email to those who had not completed the survey. Of the 252 (IA, 71; KS, 52; MO, 96; NE, 33) contacted, 63 (IA, 16; KS, 11; MO, 28; NE, 8) responded and completed Phase I and 41 (IA, 10; KS, 8; MO, 18; NE, 5) consented to be potentially selected for Phase II interviews.

Selection of Participants

In Phase I, the researchers used a set of criteria to invite participants to complete a survey from four states in the midwest region: Iowa (IA), Kansas (KS), Missouri (MO), and Nebraska (NE). After the contact information was gathered from the public domain, such as an university website contact page, an email was sent out with an explanatory message about the purpose of the study. Participants in Phase I consisted of faculty with a specific focus on teaching reading or literacy in the education department in their public or private university. The email to these participants included a link to the survey and consent form.

Data Collection and Analysis

Data from Phase I was collected through a survey and it consisted of three sections: beliefs, self-efficacy, and perceptions. Each of these three sections had ten questions for a total of 30 questions with response choices on a 5-point Likert scale: *1 strongly disagree*, 2 *somewhat disagree*, 3 *neither agree nor disagree*, 4 *somewhat agree*, and 5 *strongly agree*. One additional item that prompted a free verse response was added to the sections about beliefs and self-efficacy; two additional items that prompted a free verse response were added to the perception section. Responses were collected on a spreadsheet along with professional and demographic data that included: current position, highest degree earned and certification area, primary assigned teaching level, higher education experience, K-12 experience, self-reported gender, self-reported race/ethnicity, self-reported age, and university size and type.

Participants' current positions included 31 (75.6%) faculty, 5 (12.2%) instructors, 1 (2.4%) adjunct, and 4 (9.8%) other category. The majority, 32 (78%), worked with undergraduate students, and 33 (80.5%) taught courses in literacy as their primary assignment. Most participants, 22 (53.7%), had 5-10 years of experience in higher education, and 24 (58.8%) had 15 or more years of K-12 experience.

The majority of participants, 38 (92.7%) were female. Most, 40 (97.6%), were Caucasian and one (2.4%) Hispanic-Latino. Almost half, 20 (48.8%), of the participants were between the ages of 51-60 years old. Participants were from a varied pool of university types and size; 33 (80.5%) were from small universities and represented public, 18 (43.9%), and private universities, 23 (56.1%). Participant numbers from each state included 10 (24.4%) from Iowa, 8 (17.5%) from Kansas, 18 (43.9%) from Missouri, and 5 (14.6%) from Nebraska.

SPSS was used to determine the distribution, central tendency, and variability of responses among all participants in Phase I who completed the survey included the following sets of items about: (a) *beliefs* about dyslexia; (b) *self-efficacy* for working with students with dyslexia and other reading challenges; and (c) *perceptions* about the extent to which their teacher educator program prepares K-12 teachers to work with students with dyslexia and is aligned with current dyslexia legislation. The data was sorted by the average rating for each item (mean), the most frequently selected rating (mode), the spread of responses (standard deviation) among responses, and by how close responses were to the extreme ratings of *strongly agree/disagree*

(skewness and kurtosis) for each set of items. Missing values appeared for some items in all sets, where participants did not respond or chose not to respond.

Further analysis of the data from Phase I was performed in Excel. The data was segregated and the frequencies were derived for each item to show what number of participants selected a particular response--*1 strongly disagree*, 2 *somewhat disagree*, 3 *neither agree nor disagree*, 4 *somewhat agree*, to 5 *strongly agree*, on a 5-point Likert scale. Missing values appear for some items in all sets, where participants did not respond or chose not to respond. Each set of items was sorted in a separate spreadsheet for the three areas for which data was gathered: (a) *beliefs* about dyslexia; (b) *self-efficacy* for working with students with dyslexia and other reading challenges; and (c) *perceptions* about the extent to which their teacher educator program prepares K-12 teachers to work with students with dyslexia and is aligned with current dyslexia legislation. For efficiency, the label of each spreadsheet was shortened to *beliefs, self-efficacy, and perceptions*. In each spreadsheet, the columns contained the question number and item content, and the rows represented the responses from each participant. Responses for each item ranged from *1 strongly disagree*, 2 *somewhat disagree*, 3 *neither agree nor disagree*, 4 *somewhat agree*, to 5 *strongly agree*, on a 5-point Likert scale.

The data was sorted and responses were color coded based on the 5-point Likert scale described above. The totals for each categorical response were listed for each item in the bottom row of the spreadsheet. The graphing function was used to create a bar graph as a visual representation to show the number of different responses for each item. Items with the highest numbers of responses and the least standard deviation from the mean were selected in each set for further analysis and discussion. Ratings with less than ten (25%) responses for an item were not considered for further discussion. The responses for each item (Table 4.1) and bar graphs (Figures 4.1, 4.2, 4.3) are discussed in the results section below. The open ended, free verse responses in each set were screened for recurrence of terminology used by participants related to their definitions, self-efficacy, and perceptions for dyslexia.

Results

The results represent data based on the responses from participants in Phase I. Questions were sorted by topic in three sets: (a) *beliefs* about dyslexia; (b) *self-efficacy* for working with students with dyslexia and other reading challenges; and (c) *perceptions* about the extent to which their teacher educator program prepares K-12 teachers to work with students with dyslexia and is aligned with current dyslexia legislation. These are referenced in the results as Set A, Set B, and Set C respectively and included ten items with response choices on a 5-point Likert scale: *1 strongly disagree*, 2 *somewhat disagree*, 3 *neither agree nor disagree*, 4 *somewhat agree*, and 5 *strongly agree.* Set A and B had an additional open response item and Set C had two open response items that were used in the selection of Phase II in the process of non-probability, purposive sampling

Beliefs About Dyslexia

The total number of participants who responded to the items in Set A was 41. One participant did not respond to all items and questions and two did not respond to item 8. The responses to items in Set A about participant beliefs about dyslexia indicate that participants had similar beliefs, *strongly agreed or somewhat agreed*, for item 1, *Dyslexia is a specific learning*

disability (SLD) (M = 4.63, SD = .49); item 5, *Inaccurate and/or dysfluent word recognition is a characteristic of dyslexia*, (M = 4.30, SD = .76); and item 7, *Students with dyslexia are able to participate in the gifted/talented program* (M = 4.70, SD = .52).

Participants were split on items 3 and 9. They *somewhat disagreed*, for item 3, *Dyslexia results from visual deficits and is characterized by letter and word reversals, (*M = 2.70, SD = 1.32), and item 9, *No empirical basis exists for the use of the term dyslexic to distinguish a group of children who are different from other experiencing difficulty acquiring literacy*, (M = 2.78, SD = 1.42). Participants were neutral for item 10. They *neither agreed nor disagreed* on item 10, *Evidence does not support what some take to be indicators or predictors of dyslexia, including clumsiness, fine motor problems, attention deficits, creativity, or handedness,* (M = 3.68, SD = 1.19).

The majority of participants *strongly agreed* on several items about their beliefs about dyslexia. Twenty-five participants (61%) believe that dyslexia is a specific learning disability (SLD) (Item 1). Twenty-nine participants (70%) believe that students with dyslexia are able to participate in the gifted/talented program (Item 7). Thirteen participants (31%) believe that evidence does not support what some take to be indicators or predictors of dyslexia that include clumsiness, fine motor problems, attention deficits, creativity, or handedness (Item 10). Twenty-one participants (51.2%) *somewhat agreed* that letter and word reversals are typical of developing readers and not specific to students with dyslexia (Item 4) and 20 (48.8%) indicated that inaccurate and/or dysfluent word recognition is a characteristic of dyslexia (Item 5).

Neither agree/disagree responses were not dominant for any of the questions in this set. However, one item received the most *neither agree/disagree responses.* Nine (22%) believe that evidence does not support what some take to be indicators or predictors of dyslexia that include clumsiness, fine motor problems, attention deficits, creativity, or handedness (Item 10). For each of these items, the number of participants who indicated *somewhat disagree* or *strongly disagree* was below 10 (25%).

The open ended question item, *What is your current understanding of and definition for dyslexia?* prompted responses to include terminology to describe dyslexia. Participants' responses identified dyslexia as a neurobiologically based learning disability, associated with language processing, resulting in poor word recognition and decoding difficulties. Outlier responses included references to letter reversals and that the institution relies on the definitions provided by the state and/or IDA.

Self-Efficacy

The total number of participants who responded to the items in Set B was 41. One participant did not respond to item 4 and 6. The responses to items in Set B about participant self-efficacy for working with students with dyslexia participants had similar responses. They *strongly agreed or somewhat agreed* for item 1, *I am comfortable working with students with dyslexia* (M = 4.24, SD = .97); item 2, *I am comfortable working with students with reading difficulties*, (M = 4.61, SD = .86); item 4, *I believe students with dyslexia should work with a reading specialist, special educator, speech-language pathologist, or other personnel with special training to address their specific learning/reading needs*, (M = 4.33, SD = .97); item 8, *I believe when working with students with dyslexia or students who experience reading difficulties, optimal instruction calls for teachers' professional expertise and responsiveness, and for the freedom to act on the basis of professionalism*, (M = 4.44, SD = .84); and item 9 *I believe*

students with dyslexia need instruction that is structured, sequential, and multisensory, (M = 4.39, SD = .83).

Ratings of *strongly disagree or somewhat disagree*, did not appear for any question in this set. Ratings of *neither agree nor disagree*, averaged for item 3, *I am comfortable and understand how to screen and assess the reading abilities of students with dyslexia,* (M = 3.76, SD = 1.16).

The total number of participants who responded to the items in Set B was 41. One participant did not respond to items 4 and 6. The majority, 31 participants (75.6%), *strongly agreed* that they are comfortable working with students with reading difficulties (Item 2). Twenty-one (51%) *strongly agreed* that students with dyslexia should work with a reading specialist, special educator, speech-language pathologist, or other personnel with special training to address their specific learning, language, or reading needs (Item 4). Twenty-seven participants (66%) *strongly agreed* that teaching students with dyslexia or students who experience reading difficulties is too complex a task for a scripted, one-size-fits-all approach or program (Item 7). Twenty-six (66%) believe that when working with students with dyslexia or students who experience reading difficulties, optimal instruction calls for teachers' professional expertise and responsiveness, and for the freedom to act on the basis of that professionalism (Item 8). Twenty-three (56.1%) believe that instruction should be structured, sequential, and multisensory (Item 9).

A greater number, 17 participants (41.5%), *somewhat agreed* that they are comfortable and understand how to screen and assess the reading abilities of students with dyslexia (Item 3). Ten (24%) *somewhat agreed* that there is no certifiable best method for teaching reading to children with dyslexia or children who experience reading difficulties (Item 6). Twelve (29%) of the participants *somewhat agreed* that they need more training in order to feel confident working with students with dyslexia (Item 10). *Neither agree/disagree*, *somewhat disagree*, and *strongly disagree* responses were not dominant for any of the questions in this set. For each item, the number of participants with these responses was below 10 (25%).

The open ended response to the item, *Explain the extent to which you feel you and colleagues at your institution are prepared to teach students with dyslexia*, expressed the level of comfort participants felt as teacher educators to address the needs of students with reading difficulties and students with dyslexia. Responses emphasized their high level of comfort to instruct and diagnose reading difficulties but they expressed a willingness to learn more about instruction and diagnosis for dyslexia. They mentioned confidence with foundational skills (phonological and phonemic awareness, and phonics), experience, and training as reading specialists. A few mentioned specific training such as Orton-Gillingham, Davis Dyslexia, and additional training from “experts” that boosted their self-confidence to work with students with dyslexia.

Perceptions

The total number of participants who responded to the items in Set C was 41. One participant did not respond to items 5 and 10. The responses to questions in Set C about participant perception of program effectiveness in light of dyslexia legislation were mixed between agreement and disagreement. Participants *strongly agreed* or *somewhat agreed*, for item 2, *My institution adequately prepares our students to work with individuals with reading difficulties,* (M =4.17, SD = .77); item 7, *My institution appropriately emphasizes teacher use of critical thinking, knowledge of a wide range of research-based best practices and institutional*

decision making for meeting individual student needs, (M =4.29, SD = .87); and item 9, *My institution adequately addresses a multilinguistic approach to reading instruction that directly teaches the structure of language at all levels, including the speech sound system (phonology), the writing system (orthography), the structure of sentences (syntax), the meaningful parts of words (morphology), word and phrase meaning (semantics), and organization of spoken and written discourse*, (M = 4.22, SD = .85).

Averages of *strongly disagree* or *somewhat disagree* appear for item 6, *My institution appropriately teaches one best method to help children with dyslexia learn to read that is systematic, explicit, intensive, phonics-based and multi-sensory*, (M = 2.39, SD = 1.22). Participants *neither agreed* nor *disagreed* on item 10, *My institution adequately addresses a range of approaches/methods for reading instruction, including but not exclusive to what is known as structured literacy*, (M = 3.83, SD = .87).

The total number of participants who responded to the items in Set C was 41. One participant did not respond to items 5 and 10. In contrast to the other two sections about beliefs and self-efficacy, this particular section had more *neither agree/disagree*, *somewhat disagree*, and *strongly disagree* responses. A greater number, 18 participants (43.9%), *strongly agreed* that their institution adequately teaches how to screen and assess students with reading difficulties (Item 5). A closely equal number of participants *were in agreement* that their institution adequately and appropriately prepared teacher candidates with legislation requirements and instructional best practices for working with students with dyslexia. The majority of participants, 17 (41.5%) *strongly agreed* and 16 (39%) *somewhat agreed* that their institution adequately complies or has taken appropriate steps to comply with current or draft dyslexia legislation in their state (Item 3). Twenty (49%) *strongly agreed* and 16 (39%) *somewhat agreed* that their institution appropriately emphasizes teacher use of critical thinking, knowledge of a wide range of research-based or evidence-based best practices and instructional decision-making for meeting individual learner needs (Item 7). Eighteen participants (44%) *strongly agreed* and 16 (39%) *somewhat agreed* that their institution adequately addresses a multi linguistic approach to reading instruction that directly teaches the structure of language at all levels, including speech sound system (phonology), the writing system (orthography), the structure of sentences (syntax), the meaningful parts of words (morphology), word and phrase meaning (semantics), and organization of spoken and written discourse (Item 9).

A greater number of participants, 22 (53.7%) *somewhat agreed* that their institution adequately prepares students to work with individuals with dyslexia (Item 1) and the same number of participants also somewhat agreed that their institution adequately prepares students to work with individuals with reading difficulties (Item 2). Seventeen participants (42%) *somewhat agreed* that their institution adequately teaches how to screen and assess students with dyslexia (Item 4) and 43.9% (n=18) *somewhat agreed* that their institution adequately addresses a range of approaches/methods for reading instruction, including but not exclusive to what is known as "structured literacy" (Item 10).

A greater number of participants, 15 (36.6%), *neither agreed/disagreed* that their institution adequately addresses a range of theoretical models that describe how individuals learn to read, including but not exclusive to Gough and Tunmer's (1986) The Simple View of Reading (Item 8). Thirty-one participants (31.7%) *strongly disagreed* that their institution appropriately teaches one best method to help children with dyslexia learn to read that is systematic, explicit, intensive, phonics-based and multi-sensory (Item 6).

There were two open ended response items in this set. In response to the item, *Explain*

whether or not you feel your institution adequately prepares your undergraduate and/or graduate students to teach students with dyslexia, participants listed they provided tools and training on dyslexia to their students, intentionally included more information in courses (introductory and methods), offered optional or required endorsements in reading, and overall continued to enhance the ways in which they already addressed dyslexia. In addition, teacher educators expressed their willingness to learn more about dyslexia through training.

In response to the second item in this set, *Explain whether or not you feel your institution is prepared to meet current or pending dyslexia legislation in your state. What, if any, action steps has your institution taken to prepare?* participants noted their willingness to learn more and to continue to redesign or restructured courses to align with standards, or to introduce new courses at the graduate level. Depending on their state's legislation mandates, some listed that they provided required online training for their students and engaged in professional development themselves, when available. They expressed that they were compliant with current legislation on dyslexia and were at various stages of implementation. Some concerns included the lack of collaboration between learning centers and higher education for professional development, and the demand of already heavy academic program requirements on students who have to possibly take on more information or course work to meet requirements.

Table 4.1

Mean and Standard Deviation for items in Sets A, B, and C

Item	Set A		Set B		Set C	
	M	SD	M	SD	M	SD
1	4.63	.49	4.24	.97	3.61	1.02
2	3.18	1.39	4.61	.86	4.17	.77
3	2.70	1.32	3.76	1.16	4.05	1.14
4	4.10	1.08	4.33	.97	3.46	1.27
5	4.30	.76	3.71	1.23	4.08	1.07
6	3.5	1.28	3	1.41	2.39	1.22

7	4.7	.52	4.29	1.17	4.29	.87
8	4.16	1.08	4.44	.84	3.54	1.05
9	2.78	1.42	4.39	.83	4.22	.85
10	3.68	1.19	3.51	1.38	3.83	.87

BELIEFS, SELF-EFFICACY, AND PERCEPTIONS: PHASE I

Figure 4.1

Items about Beliefs, Set A 1-10

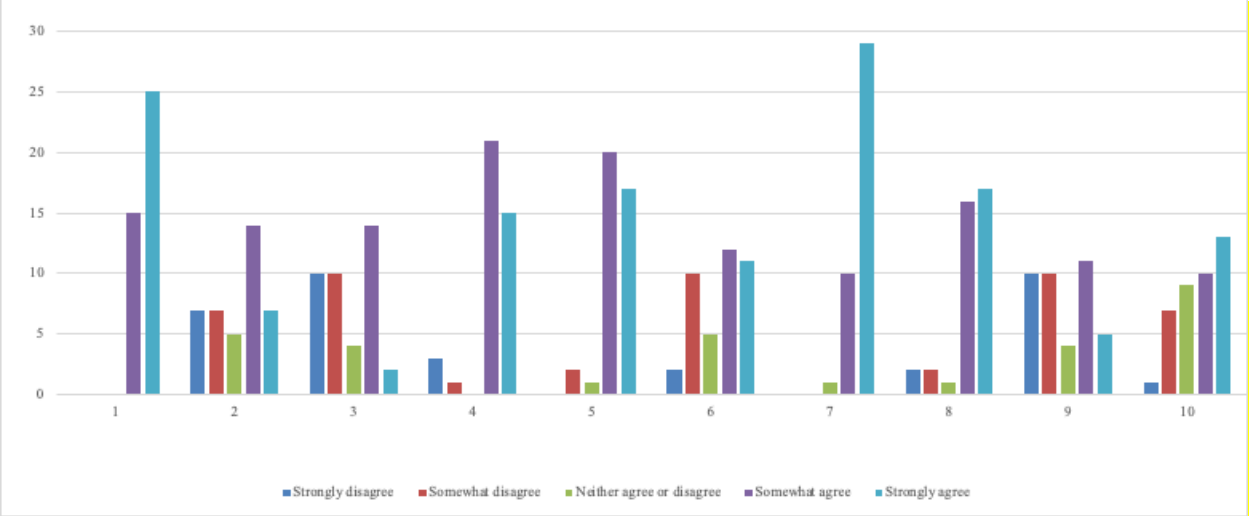
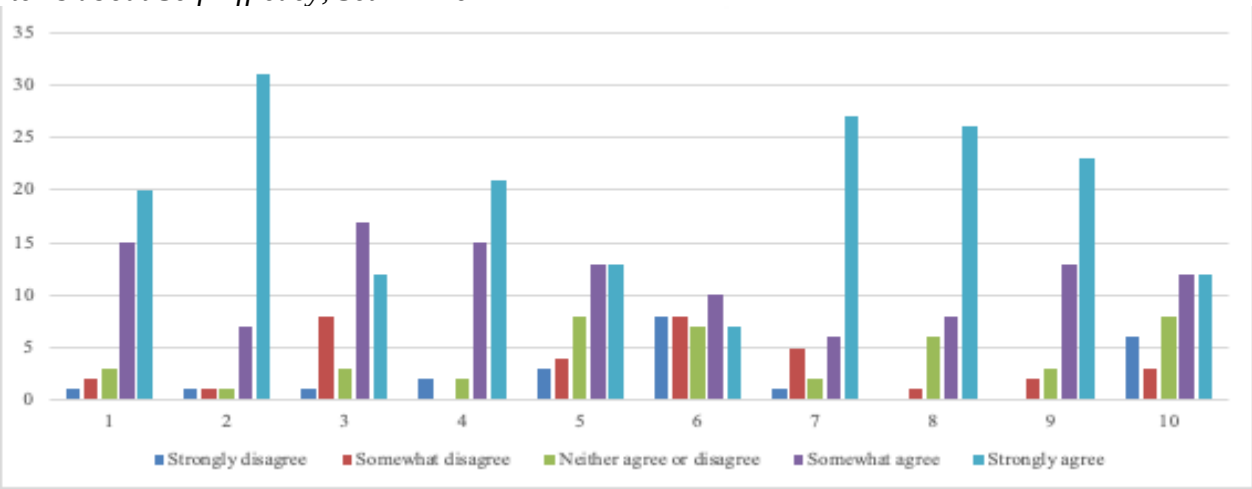


Figure 4.2

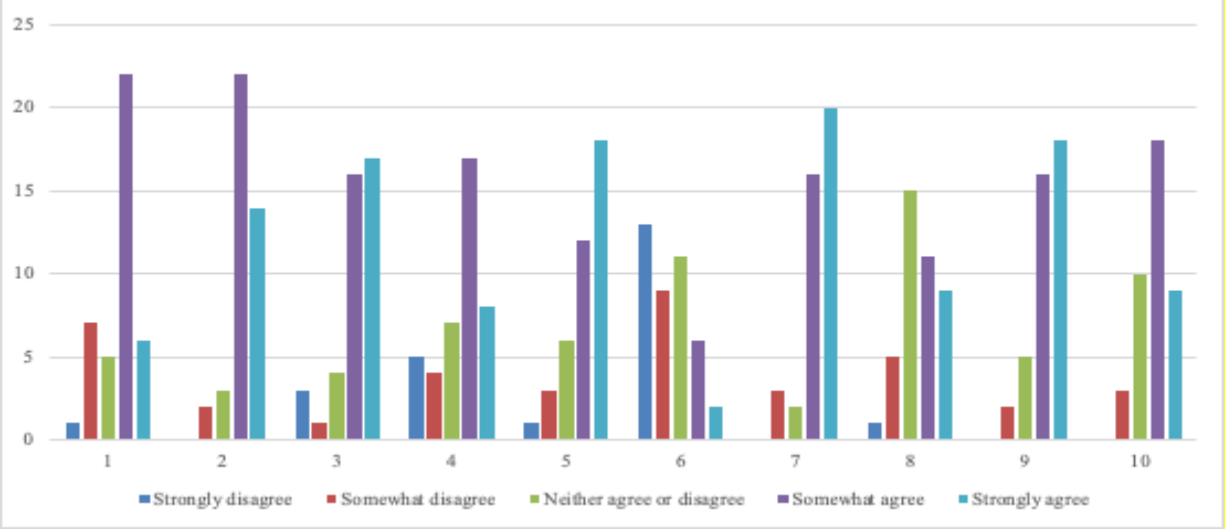
Items about Self-Efficacy, Set B 1-10



BELIEFS, SELF-EFFICACY, AND PERCEPTIONS: PHASE I

Figure 4.3

Items about Perception, set C 1-10



Discussion

The results indicate a general consensus among teacher educators about the definitions of dyslexia and their abilities to teach students with reading difficulties and students with dyslexia. Teacher educators view themselves as qualified and capable of teaching students with reading difficulties and students with dyslexia. They are reflective of their knowledge in the field of reading assessment and instruction. However, they feel that their expertise does not match the science of reading as explained in the legislation. There is a lack of clarity about concepts that are already in place but are labeled with new terminology. The responses to specific questions highlighted in the results section are discussed below.

Beliefs

Based on the survey responses of teacher educators' beliefs about dyslexia, several major points emerged. First, teacher educators do not deny the existence of dyslexia as a learning disability. They acknowledge it as a neurologically-based, specific learning disability that results from a phonological processing deficit resulting in word recognition difficulties. This finding aligns with the research consensus (Bradley & Bryant, 1983; Elliott & Grigorenko, 2014; IDA, 2022; Kilpatrick, 2016; NICHD, 2022; Peterson & Pennington, 2012; Vellutino et al., 2004). Secondly, teacher educators are informed about what dyslexia is and about the root causes of dyslexia. Participants believe that a phonological deficit is not a deficit in overall academic ability, regardless of IQ. There was an agreement among teacher educators that observable behaviors such as letter and word reversals, and inaccurate and/or dysfluent word recognition are typical of developing readers and not specific to students with dyslexia. These findings also align with current research and present a challenge for the early, accurate identification of dyslexia (Elliot 2020; Peterson & Pennington, 2012; Snowling et al., 2003).

Thirdly, there was a confusion related to this contested construct. There was more uncertainty about predictive factors of dyslexia among participants. The evidence cited in the

literature about predictive factors of dyslexia, specifically examined genetic, family, and environmental factors as major predictive factors of dyslexia (Peterson & Pennington, 2012; Thompson et al., 2015). Most participants *strongly agreed* that observable characteristics such as clumsiness, fine motor problems, attention deficits, creativity, or handedness are not predictors of dyslexia; however, almost an equal number of participants still considered these observable characteristics to be predictors of dyslexia (Q10) where the participants *neither agreed/disagreed.* Currently, there is a lack of consensus for these characteristics. This finding confirms what is known that confusion exists in regards to observable characteristics for the diagnosis of dyslexia (ILA Research Advisory, 2016) other than the consensus that dyslexia is neurologically-based, specific learning disability that results from a phonological processing deficit. Further studies about the characteristics and cut-off point between varied reading difficulties and dyslexia are needed in order to establish consensus for the criteria for accurate diagnosis.

The number of responses from participants in this section who *somewhat disagree* or *strongly disagree* was low. A few participants, less than 25% of responses, *somewhat disagreed* that there is no empirical basis for the use of the term dyslexic to distinguish a group of children who are different from others who experience difficulty with literacy acquisition. Less than a quarter of the participants *somewhat disagree* or *strongly disagree* that dyslexia results from visual deficits and is characterized by letter and word reversals. Responses aligned with the literature stating that studies do not exist that point to unique characteristics in spelling, reading, or brain structure that are unique to dyslexia from other decoding challenges (Cassar et al., 2005; Ramus & Szenkovits, 2008; Tanaka et al., 2011)

In summary, Phase I found that the responses indicate that teacher educators believe that dyslexia exists and are knowledgeable of the general concept of dyslexia and its characteristics for which there is research consensus. However, the boundary between a developing or struggling reader and dyslexia is unclear, and there is some confusion about the observable characteristics of dyslexia. These findings are consistent with research review that shows dyslexia is a vague concept and that lack of consensus exists for the definition. This is also consistent with Worthy et al., (2018a) research findings from 25 teacher educator participants that found the majority of participants expressed no clear differences between dyslexia and other reading difficulties. Additional investigation is needed to understand participants' reasons for these responses, which is discussed in the suggestions for further research.

Self-Efficacy

Teacher educators identify as qualified professionals who feel confident to address the needs of struggling readers and students and to screen and assess for dyslexia. They also acknowledge the need to continue to learn and to apply emerging evidence-based research to best support students with dyslexia. Participants' responses recognize the importance for the collaborative involvement of a wide range of specialists inclusive of reading specialists, special educators, speech-language pathologists, or other personnel with special training to address the specific learning, language, or reading needs of students with dyslexia. Teacher educator confidence to address the needs of students with reading difficulties and dyslexia is consistent with current research (i.e., Worthy et al., 2018a). As with findings from Worthy et al. (2018a), participants' responses in the current study: (a) were influenced by the authoritative discourse (AD) of the dyslexia legislation; (b) demonstrated a desire for dyslexia-specific trainings; and (c)

highlighted a degree of doubt in their knowledge and expertise when the label "dyslexia" was used.

Previous research found that the way students were labeled with either "reading difficulties" or "dyslexia" influenced teachers and teacher educators' sense of efficacy for working with students with reading challenges (Worthy et al., 2016; Worthy et al., 2018a; Worthy et al., 2018b). At present, dyslexia is not clearly defined, it is based on deficit models, and there are no clear directions on how to address it in terms of accurate diagnosis and effective classroom instruction. These points of confusion should not be equated with teachers' and teacher educators' lack of knowledge. This is the effect of the narrative created by the AD found in legislation on dyslexia that promotes an absolute, one-size-fits all best way to teach reading. Such certainly is not reflected in the current body of research.

There is, however, a consensus that reading needs are best addressed when teachers are allowed to utilize their professional expertise to fit the profile of the reader, which also includes structured, sequential, and multisensory instruction for students with dyslexia specifically and that was reflected in the participants' responses. These responses reflect the findings of the NRP report (2000) which has called for phonological and phonemic awareness instruction, and systematic, explicit, phonics instruction. Most, however, *somewhat agreed* that it is not best practice to use one specific method or approach for teaching reading for struggling readers and students with dyslexia. The one-size-fits-all approach was also discouraged by the findings of the NRP report. While teacher educators feel confident with how to screen and assess reading difficulties such as dyslexia (Q3) and provide evidence-based reading instruction for struggling readers, they would like to expand their knowledge and practice for students diagnosed with dyslexia, which would require specific instructional methods. Their commitment to continuous learning is consistent with findings by Worthy et al. (2018a) that suggest teacher educators "approach the teaching of students with reading challenges with a spirit of inquiry" and "[support] the importance of knowledgeable and adaptive teaching, meaningful assessment, and responsive, comprehensive literacy instruction for *all* students (pp. 142-143). Furthermore, it is consistent with Worthy et al. (2018a) that teacher educators value the need to focus on instruction that is tailored to meet the needs of individual student challenges.

The instructional method is dependent on how dyslexia is diagnosed and by the identification of unique characteristics that distinguish a struggling reader from a student with dyslexia. Lack of research consensus around the definition, unique characteristics, identification and assessment tools and parameters, and one best instructional approach was a point of confusion that was discussed previously.

The number of responses from participants who *neither agree nor disagree*, *somewhat disagree* or *strongly disagree* was low on any of the questions in the efficacy section. Overall, participants felt qualified and confident to address the needs of students with reading difficulties that include the needs of students with dyslexia. This high sense of efficacy is not a surprise and it echoes Worthy's (2018a) conclusion that teacher educators' confidence can be attributed to their breadth and depth of knowledge, experience, and expertise. Although teacher educators feel confident, they are committed to continuous learning for how to best address specific reading difficulties, such as dyslexia. As illustrated by Worthy (2018a), the way teacher educators approach reading instruction is different from the AD discourse presented in the legislation.

Perceptions

In contrast to the other two sections about beliefs and self-efficacy, this particular section included responses that participants either *strongly* and *somewhat agreed* or *strongly disagreed* on. Participants *somewhat agreed* that their institution appropriately prepares teacher candidates to be critical thinkers, who utilize knowledge of a wide range of research-based or evidence-based best practices to make instructional decisions tailored to individual learner needs. In addition, they s*trongly or somewhat agreed* that their institution adequately addresses a multi-linguistic approach to reading instruction that directly teaches the structure of language at all levels (i.e., phonology, orthography, syntax, morphology, semantics, spoken and written discourse. Participants s*trongly or somewhat agreed* that the teacher candidates are adequately prepared to work with students with reading difficulties, which includes a wide-range of instructional methods, including structured literacy.

Most of the participants *strongly* or s*omewhat agreed* that their institution adequately complies with current or draft dyslexia state legislation specific to higher education. While they *strongly agree* that they adequately teach how to screen and assess students with reading difficulties, they *somewhat agree* that they adequately prepare students to work with individuals with dyslexia and to screen and assess students with dyslexia.

However, most participants *strongly or somewhat disagreed* that their institution appropriately teaches one best method to help children with dyslexia. Teacher educators did not consider the use of one instructional approach (i.e., systematic, explicit, intensive, phonics-based and multi-sensory) to be best practice when working with a spectrum of reading abilities. As recommended and directly expressed in the NRP (2020), effective reading instruction is found in a balanced program rather than one specific approach (e.g., emphasis on phonics).

While the language in the legislation promotes the "science of reading" and "evidence-based" instructional practices, it does not explicitly promote a wide-range of approaches that allow teachers to implement individualized instruction for specific reading difficulties. The research on reading is portrayed as new and novel within the AD through the use of different terminology and rebranded concepts that are presented as absolutes. Participants' responses showed an awareness that information presented as "new and novel" instead was built upon a longstanding body of reading research. In addition, teacher educators have valuable literacy knowledge and experiences and through their unique perspectives can value-add to the current literacy reform initiative. They adequately prepare students to use a range of theoretical models and frameworks to work with individuals with reading difficulties and dyslexia. They comply with current dyslexia legislation; however, mandates that dictate one particular instructional method are in conflict with what they know about best practice to address various reader profiles. There is a confusion about the legislation, specifically about how it redefines what is accepted as research and evidence-based practice. In alignment with previous studies (Worthy et al., 2018a), responses illustrate the inconsistency and contradictions between dyslexia discourse that conveys certainty about dyslexia, its characteristics, and the identification that is not supported with the same level of certainty within current research.

As in the previous section on efficacy, teacher educators value the ability of teachers to apply a wide-range of instructional approaches that best fit the reading abilities of individual students. However, there is confusion about how a broad base of widely accepted theories and practices informs legislation and how it changes what is currently accepted as research and evidence-based practice. We attribute such confusion to the AD used to present the science of

reading and other key concepts and terminology used within the dyslexia legislation as new, absolute, and with research consensus. As teacher educators negotiate and make sense of this legislation, they compare it to their existing knowledge and practices and the larger reading research base. Confusion about the definition, characteristics, and identification for dyslexia exists within the survey responses in the perspectives section. This can be explained by a lack of research consensus for these same three key constructs for dyslexia.

Limitations

The survey utilized a non-probability sample in four midwestern states and survey responses were voluntary. All four states are at different places in their legislation on dyslexia and participants' responses may reflect that. A sampling bias is possible and statistical inferences cannot be made from a sample that may not be representative of the population. The questions in the survey are not from a validated survey instrument and were based on previous publications in studies about dyslexia, teacher educators, and legislation. Further, in-depth qualitative investigation to examine the reasons for particular responses is needed and is reflected in the design of Phase II. At the second phase, one-on-one semi-structured interviews were conducted in order to directly speak to participants about their beliefs, self-efficacy, and perception.

Suggestions for further research

Several items for further research and investigation emerged from the Phase I responses. Currently, it appears that there is no consensus among researchers and scholars across fields and the legislation on the definition, identification, and instruction for dyslexia. More investigations on dyslexia are needed with teacher educators as most surveys are conducted with K-12 teachers. Investigations with teacher educators on this topic will require a valid and reliable tool.

Additional investigation is needed in order to understand what differentiates a developing or struggling reader from a reader with dyslexia. It is presently not clear how and when dyslexia is accurately identified, and what assessment tools and instructional practices are to be used in the educational setting. Recommendations for identification come from cognitive psychology, clinical setting research and more action research in the school setting is needed.

In order to explain the results in Phase I, further investigation into the responses is needed. Specifically, there is a need to examine the reasons for responses where there was confusion or lack of agreement and doubt about the role of the legislation and related discourse. We used responses of participants in Phase I to purposefully select participants for Phase II. Criteria for selection included diverse demographics, level of experience, and institution size, with various knowledge and perspectives posed in the survey.

Conclusion

Disagreement exists between clinical and practical application of research about reading difficulties and dyslexia. Legislation has been passed that mandates one-size-fits-all reading assessments and instruction under the false assumption that a "settled science of reading" exists. Teacher educators want to contribute to this discourse but at present their voices were left out. Advocacy groups have cast doubt on teacher educators' knowledge and experience and instead positioned themselves as dyslexia experts in part by rebranding reading research and codifying

specific terminology that lacks research consensus (i.e., science of reading, dyslexia,, structured literacy). Much of the research base in the review of literature may seem redundant and common knowledge to those who have been in the reading field, conducted research themselves, or worked with struggling readers. Research on reading has evolved across centuries and the term "science of reading" has been used across professional literature for 200 years (Shanahan, 2020). Yet, advocates present a narrowly defined definition for SOR as new and supported by research consensus that is based one one type of research, largely comes out of the field of neuroscience (brain-based studies), and does not connect to classroom instruction.

The reason for the study is not to resist but rather to embrace efforts to improve reading instruction and early identification of varied reading difficulties. Teacher educators have extensive breadth and depth of knowledge around reading instruction and assessment that can be used to ensure the success of any reading policy initiative. Pressure on K-12 schools and higher education teacher educators to comply with legislation that promotes a "settled science" that does not actually align with the larger body of research on reading, may have unintended consequences for students. Collaborative discourse paves the way for how theories, frameworks, models, research from multiple disciplines, and research promoted by the new "science of reading," can help the translation of research into practice to support all learners.

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