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Does teacher efficacy predict writing practices of teachers of deaf and hard of hearing students

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Abstract

Forty-four elementary grade teachers of deaf and hard of hearing students were surveyed about how they taught writing and their beliefs about writing. Beliefs about writing included their efficacy to teach writing, attitude towards writing, and epistemological beliefs about writing. These teachers from 15 different states in the United States slightly agreed they were efficacious writing teachers and they were slightly positive about their writing. They slightly agreed that learning to write involves effort and process, moderately disagreed that writing development is innate or fixed, slightly disagreed that knowledge about writing is certain, and were equally split about whether writing knowledge comes from authorities and experts. On average, teachers applied the 22 instructional writing practices surveyed at least once a month. They reported their students wrote weekly, and their writing was supported through goal setting, feedback, and prewriting activities. Writing instruction mostly focuses on teaching grammar and how to plan compositions. Teacher efficacy uniquely and statistically predicted reported teaching practices after attitude towards writing and epistemological beliefs were first controlled. Recommendations for future research and implications for practice are presented.

Key Words: deaf, hard of hearing, writing, teacher efficacy, instruction, attitudes, epistemology

Does Teacher Efficacy Predict Writing Practices of Teachers of DHH Students?

Teachers play a critical and essential role in students' development. As Cochran-Smith and Zeichner (2005) observed, "Teachers are among the most, if not the most, significant factors in children's learning..." (p. 1). This is true for students in general as well as students who are deaf and hard of hearing (DHH; Garberoglio et al., 2012). Despite the importance of teachers, research on teachers and teaching is not as common as it should be (Graham, in press), with very little research examining the characteristics and instructional practices of teachers of DHH students.

One area of research receiving increased attention over the last four decades is the study of teachers' beliefs and their possible impact on teaching (e.g., Chan & Elliott, 2004; Fives & Buehl, 2012; Klassen et al., 2011; Tschannen-Moran et al., 1998). Particularly prominent in the study of teachers' beliefs is the concept of teacher efficacy. Efficacy involves, "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainment" (Bandura, 1977, p. 3). Teachers' sense of efficacy is commonly viewed as an important teacher characteristic, as it has been hypothesized that teachers' who are more assured about their teaching capabilities are better teachers, more committed to teaching, evidence higher levels of job satisfaction, and positively impact students' achievement (e.g., Aloe et al., 2014; Midgley et al., 1989; Ross et al., 1996). A recent review of 165 teacher-efficacy studies by Zee and Koomen (2016) supported these claims, demonstrating that teacher-efficacy directly and indirectly influences classroom practices, student outcomes, and teachers' well-being. Consequently, teachers' sense of efficacy is an important determinant of their classroom actions.

While teacher efficacy has often been studied as a general or omnibus trait (Ross et al., 1996), Bandura (1981) cautioned that efficacy beliefs vary depending on subject area, task, circumstance, or instructional activity. Many researchers have heeded Bandura's warning, examining teacher efficacy in specific academic domains such as writing, math, or reading (e.g., Graham et al., 2001; Midgley et al., 1989; Yildirim, 2012), different cultures (e.g., Bañales et al., 2020; Hsiang & Graham, 2016), or with specific groups of teachers (e.g., Graham et al., in press; Rietdijk et al., 2018). The current study applied Bandura's recommendation by examining the efficacy of elementary grade teachers of DHH students. More specifically, we focused on these teachers' sense of efficacy to teach writing, and if this sense of efficacy predicted their reported writing practices, after first controlling for variance due to their attitude towards writing and their epistemological beliefs about writing.

Previous studies have assessed general education teachers' efficacy to teach writing and examined the variance it accounts for in how they teach this complex skill (e.g., De Smedt et al., 2016; Gilbert & Graham, 2010). General education elementary grade teachers slightly to moderately agree that they are efficacious writing teachers (Graham, 2019), and research by Brindle et al. (2016) indicated that teacher efficacy can uniquely account for up to 13% of the variance in reported writing practices after other teacher beliefs are first controlled (e.g., attitudes toward writing, orientation to teaching writing).

This is the first study to our knowledge to specifically examine these issues with teachers of DHH students. A previous study by Garberoglio et al. (2012) investigated teachers and administrators' efficacy for managing the classroom, promoting engagement, and using instructional strategies when teaching students identified as DHH. While teachers reported a high sense of efficacy in each of these three areas, the study did not provide any insight to

participants' efficacy for teaching a specific subject like writing nor did it examine if efficacy predicted classroom practices.

Research Questions

We asked the following research questions:

1. What levels of efficacy for teaching writing, attitudes towards writing, and epistemological beliefs about writing are held by elementary grade teachers of DHH students?
2. How frequently do elementary grade teachers of DHH students teach writing and support students as they write?
3. Does teacher efficacy predict teaching and supporting students' writing after variance due to teachers' attitude towards writing and epistemological beliefs about writing are first controlled?

The theory of writing that guided the present investigation was the Writer(s)-within-Community model (WWC; Graham, in press, 2018a, 2018b; Graham & Harris, 2018). This model proposed that the teaching of writing is a social activity that takes place within specific communities, such as an elementary grade classes for DHH students. A basic principle underlying the operation of the model is that writing and teaching writing are simultaneously and interactively shaped by the communities in which they occur as well as the cognitive capabilities and resources of community members who write or teach writing. Accordingly, the teaching of writing is shaped and bound by the characteristics of a classroom writing community including purposes for writing, typified actions for teaching and supporting writing, physical and social environment in which writing occurs, available tools for writing, and the history of the class over the course of the school year. At the same time, teachers' instructional intentions and actions are

shaped and bound by their beliefs and knowledge about writing, teaching, their students, themselves, and their classroom writing community.

Teacher Beliefs

Central to the current investigations are teachers' beliefs. Teacher beliefs play an essential role in the WWC model (Graham, in press), as it is assumed that they fuel the decisions teachers make, influencing what instructional actions and teaching tools are applied as well as how much effort is invested in the teaching process. Teacher beliefs include judgements about competence to teach writing, attitudes about writing, epistemological assumptions about how writing develops and is learned, purposes for engaging in writing and writing instruction, views about one's identities as a writer and teacher, opinions about why one is successful as a writing teacher, and conclusions about the value, capabilities, and purposes of the classroom writing community and its members (including perceived writing competence of one's students). These beliefs singularly and interactively impact teachers' instructional behaviors. For example, teachers who are highly positive about their capabilities to teach writing (i.e., efficacy) may devote considerable time and attention to teaching writing if they believe they will be effective, but the positive influence of efficacy may be attenuated for teachers who conjointly believe that good writing is an innate ability and not a learned one (i.e., epistemological beliefs).

Teacher Efficacy. In this investigation, we focused primarily on teachers' beliefs about their efficacy. This is one of the few teacher characteristics that is consistently related to student achievement (see Zee & Kooman, 2016), including students' writing achievement (De Smedt et al., 2016; Parker et al., 2006; Tschannen-Moran & Barr, 2004). In essence, students' writing performance is higher in classrooms and schools where teachers are more confident about their capabilities to teach writing. Further, teachers who report a greater sense of efficacy to teach

writing are more likely to devote greater attention to teaching this skill than teachers who are less confident (e.g., Brindle et al., 2016; De Smedt et al., 2016; Gilbert & Graham, 2010; Hsiang & Graham, 2016; Rietdijk et al., 2018). Teacher efficacy is also malleable, as it can be enhanced through instruction (Dillard 2004; Oh, 2011). These findings make efficacy for teaching writing an important variable in the study of teachers of DHH students, especially since there are no previous investigations addressing this topic with these educators.

Attitudes and Epistemological Beliefs. We did not limit our examination to teacher efficacy, as we also examined teachers' attitude towards writing and their epistemological beliefs about writing. Attitudes are an indication of how much a person likes or dislikes something (Ekholm et al., 2018), and teachers who are more positive about their own writing may be more likely to teach writing than teachers who feel less positive about how they write (Hsiang et al., 2018). Epistemological beliefs about writing in the current study were based on teachers' opinions on whether writing development is innate or fixed, writing development occurs through effort and process, writing knowledge is certain, and writing knowledge comes from experts and authority figures (see Chan & Elliott, 2004 and Schraw & Olafson, 2003 for a discussion of these epistemological beliefs applied to learning more broadly). These epistemological beliefs should shape teachers' instructional actions (Fives & Buehl, 2012), as they serve as a filter for initiating, maintaining, and interpreting classroom practices. Because the WWC model (Graham, in press, 2018a, 2018b) emphasizes the singular and interactive effect of teachers' beliefs on their instructional actions when teaching writing, we included attitude towards writing and the four epistemological beliefs as control variables when examining whether teacher efficacy predicted the writing practices of elementary grade teachers of DHH students.

Instructional Practices

To examine teachers' writing instructional practices, we focused our attention on the social and cognitive aspects of learning to write. This is consistent with the WWC model (Graham, in press, 2018a, 2018b) which is based on the premise that writing and learning to write involve social as well as cognitive processes. It also reflects the types of approaches applied to teaching writing in the field of deaf education (see Strassman & Schirmer, 2012). The deaf community has tested a variety of socially-oriented instructional procedures for teaching writing including apprenticeship models, collaborative writing, communities of practice, teacher established goals for writing, and teacher feedback (e.g., Kluwin & Kelly, 1992; Schirmer et al., 1999; Schirmer & England, 2003; Wolbers, 2008b). It has also applied a variety of cognitively-oriented instructional models where students identified as DHH were taught skills, strategies, and writing knowledge (e.g., Akamatsu, 1988; Berent et al., 2007; Schirmer et al., 1999; Wolbers, 2010). Further studies have embedded both social and cognitive aspects within writing instruction occurring with students identified as DHH (Dostal & Wolbers 2014, 2016; Wolbers, 2008a; Wolbers et al., 2012; Wolbers et al., 2018).

Consequently, we examined if elementary grade teachers of DHH students supported students' writing through social mechanisms such as collaboration, teacher and student established writing goals, feedback, editing assistance, positive feedback/ praise, pre-writing activities, and writing multiple drafts. We further examined if these teachers of DHH students taught them the cognitive skills they need to be successful writers, including planning and revising strategies, self-regulation strategies for writing, editing skills, paragraph construction, vocabulary for writing, grammar skills (including differences between ASL and English grammar for writing), as well as knowledge about different genres and the characteristics of writing. Teaching writing also included queries about how frequently students wrote (i.e.,

practice writing), and whether teachers used formative assessment procedures to guide their writing practices. While we did not survey all possible writing practices the participating teachers might have used, as teachers are not likely to complete such a long survey, the instructional practices queried were ones that teachers were likely to apply in order to address their students' writing challenges. This includes challenges with English syntax and semantics when writing, transition from ASL to English, organization, ideation, regulation of the writing process, as well as planning, revising, and editing (see Strassman & Schirmer, 2012; Williams & Mayer, 2015). Currently, we know almost nothing about how writing is taught to elementary grade students identified as DHH. This study addresses this issue by examining how teachers in 15 states in the United States provided such instruction.

Predictions

We anticipated that elementary grade teachers of DHH students would be slightly to moderately positive about their efficacy to teach writing. While teachers of DHH students in Garberoglio et al. (2012) expressed a high sense of efficacy for classroom management, promoting engagement, and using instructional strategies in general, we anticipated teachers in this study would not be as confident about their capabilities to teach writing for two reasons. One, elementary grade teachers indicate that writing is the content area they are least prepared to teach (see Brindle et al., 2016). Two, teachers around the world commonly express mild to moderate confidence in their ability to teach writing (Graham, 2019).

It was further expected that teachers of DHH students would be slightly positive about their attitude towards writing, as this is commonly the case with teachers in general (Graham, 2019). In terms of epistemological beliefs about writing, we predicted that teachers of DHH students in this study would agree that students learned to write through effort and process and

knowledge mostly comes from authorities or experts, and they would disagree that writing development was innate/fixed and writing knowledge was certain. These predictions are generally consistent with findings from the only two studies investigating these beliefs (Graham et al., 2020; Hsiang et al., 2020). However, it must be noted that teachers in the United States, indicate that writing development is both innate/fixed and acquired through effort/process, whereas teachers in the Greater China region only emphasized effort/process (Graham et al., 2020).

We also predicted that the majority of elementary grade teachers of DHH students in this study would indicate they used all or most of the instructional writing procedures included in the survey, but they used most of these procedures infrequently. With a few exceptions, teachers surveyed in classrooms around the world indicate they use a variety of procedures to teach writing, but use these techniques periodically (Graham, 2019).

Finally, it was hypothesized that teacher efficacy would predict how often participating teachers indicated they taught writing and supported students' writing. Teachers who are more positive about their efficacy to teach writing should be more likely to teach writing and support it because they believe their teaching efforts are effective (Graham et al., 2001). While attitude towards writing and epistemological beliefs served as control variables, it was possible that they would each make a unique and statistically significant contribution to predicting teachers' writing practices because such beliefs shape what teachers do and serve as a filter for interpreting their actions (Fives & Buehl, 2012).

Method

Participants

Teachers participating in this study came from 15 states across the United States (i.e., Connecticut, Florida, Illinois, Kentucky, Louisiana, Massachusetts, Michigan, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, and Washington). They included elementary grade teachers from residential schools for the deaf, day schools for the deaf, self-contained classes for DHH students in public schools, as well as pull out/itinerant programs for these students in public schools. Teachers came from schools that provided letters of support for a grant application for an instructional study, attended a conference where they learned about the project, or were contacted by colleagues in the deaf education community.

Across the 15 states, there were 44 elementary grade teachers of DHH students in 24 schools. One school included nine teachers; another school five teachers, nine schools contributed two teachers, and twelve schools had one teacher each. All but three of the teachers were White. Two teachers were Black and one teacher was Asian. Teaching experience ranged from 1 to 36 years ($M = 12.43$; $SD = 9.64$). Three of the teachers had taught for just one year. All teachers were female except for one male teacher.

Fourteen percent of the teachers ($N = 6$) had completed an undergraduate degree; 68% had obtained a Master's degree ($N = 30$); and 16% had an Education of Science degree or 30 hours beyond the Master's degree ($N = 7$). As a group, the teachers were generally positive about their preparation to teach writing, with 14% indicating it was exceptional ($N = 6$), 66% adequate ($N = 29$), and 21% minimal ($N = 9$). Sixty-one percent of participating teachers indicated they used a formal writing curriculum/program in their classroom. These 27 teachers identified 19 different writing curriculum/programs they applied. The most commonly used approach was Lucy Caulkin's workshop approach applied by five teachers. No other program was applied by more than two teachers.

Approximately two-thirds of the teachers ($N = 29$) indicated their personal philosophy for teaching students identified as DHH was ASL-English bilingual. All but one of the remaining teachers indicated they supported a total communication approach, with two thirds of them indicating that total communication included the use of American Sign Language (ASL; $N = 9$). One teacher supported an Oral/Aural approach. Teachers did not always hold the same philosophical view as the school where they taught. This was the case for 16 teachers. Thirty-nine percent of schools ($N = 17$) supported an ASL-English bilingual approach, whereas 54% of the schools supported a total communication approach; two thirds of these schools involved total communication with the use of ASL ($N = 16$). Seven percent of the schools ($N = 3$) used an Oral/Aural approach.

Five of the teachers were deaf and one was hard of hearing. Eighty-six percent of teachers ($N = 38$) were non-native ASL users. On average, they had used ASL for 15.50 years ($SD = 9.26$). The remaining six teachers were all native ASL users.

Procedures

Participating teachers were asked to complete a survey. They received a letter explaining the purpose of the survey as well as the study. They were asked to answer questions honestly. They were told their responses would not be shared with other school personnel and would remain anonymous.

Measures

The survey directed teachers to indicate their gender, race, number of years teaching students identified as DHH, education completed, and adequacy of their preparation to teach writing. It also asked them to indicate if they were native ASL users (non-native users were asked to indicate number of years using ASL), and implemented a writing curriculum/program to

teach writing (naming the program if they did). They were further asked to identify their personal philosophy for teaching students identified as DHH as well as the philosophy of their school.

In addition to the questions above, teachers were asked to complete measures about their beliefs about writing and how they taught writing to their students. Measures assessing beliefs about writing included scales for efficacy to teach writing (taken from Graham et al., 2001), attitude towards writing (taken from Brindle et al., 2016), and epistemological beliefs about writing (taken from Hsiang et al., 2020). In previous studies, the efficacy items used in this study represented a single measure with acceptable reliability as did the items used to measure attitude towards writing (e.g., Brindle et al., 2016; Smedt et al., 2016). The measure assessing epistemological beliefs is a reliable multi-dimensional scale measuring various aspects of teachers' beliefs about the nature of writing, writing development, and knowing about writing (Graham et al., 2020; Hsiang et al., 2020).

The questions for the measure to assess how teachers taught students to write were taken from surveys developed by Cutler and Graham (2008) and Gilbert and Graham (2010). These surveys focused on the teaching of writing in primary (1 to 3) and intermediate grades (4 to 6). Studies conducted with elementary grade teachers demonstrated that the items included in the current study reliably assessed teachers' reported practices directly teaching writing and supporting students as they write (e.g., Brindle et al., 2016; Hsiang et al., 2016).

Teacher Efficacy for Teaching Writing

The efficacy scale for teaching writing included nine items, asking teachers if they: had effective ways to teach writing, could improve writing by finding better ways of teaching, knew the steps for teaching a writing concept so it could be mastered quickly, could exert extra effort to help a student write better, knew how to increase student retention of information not

remembered, could help students with the most difficult writing problems, could adjust a writing assignment for a student experiencing difficulty, knew how to redirect disruptive behavior during writing time, and could accurately assess if a writing assignment was at the correct level for a student experiencing difficulty. Each item included a six-point Likert-type scale where teachers could indicate they strongly disagreed (score of 1.0) to strongly agreed (score of 6.0). Coefficient alpha for this scale for the teachers participating in this study was 0.75.

Attitude towards Writing

Five items assessed teachers' attitude towards writing (I enjoy writing; I am a good writer; I enjoy learning about writing; I use writing as a tool for learning). Each item included the same six-point Likert-type scale applied with self-efficacy (higher scores represented a more positive attitude). Coefficient alpha for this scale for the teachers participating in this study was 0.84.

Epistemological Beliefs about Writing

Twenty-five items assessed teachers' epistemological beliefs about writing. We did not include five items from Hsiang et al. (2020) because they were designed specifically for teachers in the Greater China region and assessed a concept common in Chinese culture labeled heart and mind (e.g., people should train their mind to overcome difficulties when writing). The 25 items administered in this study were designed to assess the following four dimensions of epistemological beliefs about writing: writing development is innate or fixed, writing development occurs through effort and process, writing knowledge is certain, and writing knowledge comes from experts and authority figures.

Teachers responded to each of these 25 items using a six-point Likert-type scale (strongly disagree [1.0], moderately disagree [2.0], slightly disagree [3.0], slightly agree [4.0], moderately

agree [5.0], and strongly agree [6.0]; higher scores provided a more positive response).

Coefficient alphas for innate/fixed, effort/process, authority/expert, and certain knowledge for teachers in this study were 0.73, 0.75, 0.73, and 0.66, respectively.

Teachers' Reported Writing Practices

Teaching Writing. Twelve items assessed the teaching practices teachers applied to teach writing. This included teaching planning strategies, revising strategies, writing self-regulation, vocabulary, paragraphs, editing, elements of different genres, grammar. It also included items on acquiring writing knowledge through models of writing, formative assessment to guide instructional practices, independent writing time, and teaching the differences between ASL and English grammars for writing. With the exception of teaching the differences between ASL and English grammar, each of the other practices are evidence-based practices for teaching writing to elementary grade students (Graham et al., 2012; Rogers & Graham, 2008). Teachers responded to each item using an eight-point Likert-type scale (never [1], several times a year [2], once every two months [3], monthly [4], weekly [5], several times a week [6], daily [7], and several times a day [8]; higher scores indicated the teaching activity occurred more frequently). Coefficient alpha for this scale for the teachers participating in this study was 0.80.

Supporting Students' Writing. Ten items assessed procedures teachers used to support students as they wrote. This included providing praise/positive reinforcement, teacher feedback, teachers' goals for writing, peer collaboration while writing, pre-writing activities to gather and organize writing content, collaborating with the teacher, students completing multiple writing drafts, teachers editing students' writing, and students establish writing goals for their own writing. The first six items listed are evidence-based practices for supporting elementary grade students as they write (Graham et al., 2012; Rogers & Graham, 2008). Each item included the

same seven-point Likert-type scale used to respond to reported practices for teaching writing (higher scores indicated that the supporting practice occurred more frequently). Teachers responded to these items with the same eight-point scale used for teaching writing above. Coefficient alpha for this scale for the teachers participating in this study was 0.79.

Results

Teachers' Beliefs about Writing

As a group, the teachers of DHH students in this study slightly agreed that they were efficacious teachers of writing ($M = 4.41$; $SD = 0.68$; range = 2.44 to 5.67). Eight-six percent of teachers' mean score on this measure was 4.0 (slightly agree) or higher.

Teachers were also slightly positive about their attitude towards writing ($M = 4.37$; $SD = 1.00$; range = 1.83 to 5.83). The means score of 64% of the participating teachers was 4.0 (slightly agree) or higher.

Teachers' epistemological beliefs about writing were more varied. They moderately disagreed that writing development is innate or fixed ($M = 2.13$; $SD = 0.69$; range = 1.00 to 4.50), with 91% of them slightly to strongly indicating that writing development is not innate or fixed. Teachers slightly agreed, however, that learning to write involves effort and process ($M = 4.61$; $SD = 0.69$; range = 2.86 to 5.68), with 84% of them slightly to strongly agreeing with this belief. As a group, teachers were ambivalent about the belief that writing knowledge comes from authority and experts, as their mean score on this measure was at the mid-point of the scale ($M = 3.53$; $SD = 0.81$; range = 1.40 to 5.40). Fifty-seven percent of teachers' scores on this construct were above the midpoint, indicating that slightly more than one-half of the participating teachers agreed slightly to strongly with this position. Finally, teachers slightly disagreed that knowledge about writing is certain ($M = 2.92$; $SD = 0.64$; range = 1.40 to 4.40), with 66% of them slightly

to strongly indicating that writing knowledge is not certain.

Teachers' Reported Writing Practices

Teachers' mean score on the 12 items that queried them about directly teaching writing was 4.49 ($SD = 0.94$; range = 3.08 to 6.58). On average, teachers applied the 12 teaching practices monthly. On average, teachers had students write independently ($M = 5.34$; $SD = 1.48$) and taught grammar ($M = 5.30$; $SD = 2.00$), differences between ASL and English grammar ($M = 5.14$ $SD = 1.98$), and planning strategies ($M = 5.07$; $SD = 1.25$) at least weekly. The following teaching practices occurred monthly or less often on average: apply formative assessment to guide writing practices ($M = 4.70$; $SD = 1.80$), taught revising strategies ($M = 4.59$; $SD = 1.45$), taught paragraph writing ($M = 4.09$; $SD = 1.48$), taught self-regulation writing strategies ($M = 4.09$; $SD = 1.67$), taught editing ($M = 4.07$; $SD = 1.78$), taught vocabulary ($M = 3.93$; $SD = 1.82$), acquire writing knowledge through models ($M = 3.80$; $SD = 1.81$), and teach elements of different genres ($M = 3.48$; $SD = 1.64$).

Teachers' mean score on the 10 items that asked them about supporting students as they wrote was also 4.49 ($SD = 0.88$; range = 2.20 to 6.20). On average, teachers applied the 10 writing support practices monthly. On average, teachers provided praise/positive reinforcement daily ($M = 6.84$; $SD = 1.01$) and feedback on students' writing several times a week ($M = 5.91$; $SD = 1.25$). Teachers established goals for students' writing ($M = 5.09$; $SD = 1.46$) and have students engage in prewriting activities ($M = 4.84$; $SD = 1.38$) on a weekly basis. The remaining writing support practices occurred monthly or less often on average: teachers plan and compose with students ($M = 4.50$; $SD = 1.49$), collaborate with teacher on writing ($M = 4.18$; $SD = 1.81$), students complete multiple writing drafts ($M = 4.16$; $SD = 1.35$), teacher edits students' writing ($M = 2.84$; $SD = 1.60$), and students establish goals for their writing ($M = 2.82$; $SD = 1.59$).

Teacher Efficacy Predicts Teachers' Reported Writing Practices

To determine if teacher efficacy to teach writing predicts teachers' reported writing practices with students identified as DHH, two step-wise regression analyses were conducted. In the first regression analysis, we examined if teacher efficacy predicted teachers' reported use of teaching practices after first controlling for variance due to attitude towards writing and epistemological beliefs about writing. The second regression analysis was identical except the outcome variable was teachers reported use of practices to support students as they wrote. In both analyses, attitude towards writing and the four epistemological measures (innate/fixed, effort/process, authority/expert, and certain knowledge) were entered as a block in the first step of the regression analysis. Teacher efficacy was entered in the second step of the analyses. Although teachers were nested within schools, we did not conduct multi-level regression analyses, as the ICC between school and the two outcome variables (i.e., teaching writing and supporting writing) was zero.

The correlations between the reported teaching of writing and supporting writing, the control variables, and teacher efficacy are presented in Table 1. Teachers' scores for teaching writing and supporting writing were strongly correlated (0.763), indicating that teachers who more frequently taught writing were more likely to support students' as they wrote, and vice versa. Teaching writing and supporting writing were statistically and significantly related to teacher efficacy (0.325 and 0.361, respectively). Teacher efficacy was statistically and significantly related to attitude towards writing (0.319) and the epistemological beliefs of effort/process (0.554), and authority/expert (0.321). The epistemological belief of innate/fixed was statistically and significantly related to authority/expert (0.397) and certain knowledge

(0.532). Effort/process was statistically and significantly related to authority/expert (0.587), whereas authority/expert was statistically and significantly related to certain knowledge (0.338).

Teaching Writing

In step 1 of the regression analysis, five control variables (attitude towards writing, innate/fixed, effort/process, authority/expert, and certain knowledge) accounted for a statistically nonsignificant 12.5% of the variability ($p = .382$) in how frequently teachers reportedly taught writing to students identified as DHH. Teacher efficacy, when entered at step 2, explained an additional statistically significant 12.5% of the variance ($p = .019$). Statistically significant unique predictors (see Table 2), controlling for all other variables in the model, included only teacher efficacy.

Supporting Writing

In step 1 of the regression analysis, five control variables (i.e., attitude towards writing, innate/fixed, effort/process, authority/expert, and certain knowledge) accounted for a statistically nonsignificant 8.6% of the variability ($p = .616$) in how frequently teachers supported students identified as DHH as they wrote. Teacher efficacy, when entered at step 2, explained an additional statistically significant 18.7% of the variance ($p = .038$). Statistically significant unique predictors (see Table 3), controlling for all other variables in the model, included only teacher efficacy.

Discussion

Teachers who are more efficacious about their teaching capabilities are better teachers, more committed to teaching, and positively impact students' achievement (Aloe et al., 2014; Midgley et al., 1989; Tschannen-Moran et al., 1998; Zee & Koomen, 2016). Unfortunately, little is known about the efficacy of teachers of DHH students. A single study by Garberoglio et al.

(2012) reported that these teachers expressed a high degree of efficacy for managing the classroom, promoting student engagement, and using instructional strategies. The current study adds to this previous work by examining efficacy for teaching writing to elementary grade students identified as DHH, and by determining if teachers' sense of efficacy predicts their reported classroom practices after controlling for variance due to attitude towards writing and epistemological beliefs. The study further provides needed information on how writing is taught to elementary grade students identified as DHH, and whether these teachers like or dislike writing as well as what they believe about writing development and knowledge.

Teacher Beliefs

As expected, teachers in this study were slightly positive about their capabilities to teach writing, with five out of every six teachers indicating agreement; at least to some degree, they were efficacious teachers of writing. As a result, elementary grade teachers of DHH students are similar to their general education counterparts, as both groups are positive about their efficacy to teach writing, but not highly positive about these capabilities (Brindle et al., 2016; Cutler & Graham, 2008; De Smedt et al., 2016; Gilbert & Graham, 2010; Hsiang & Graham, 2016; Rietdijk et al., 2018). While it is important to conduct additional research to replicate our finding about efficacy to teach writing, it must be noted that 80% of the teachers participating in this study indicated their preparation to teach writing was adequate to exceptional. This level of preparation is high (see Graham, 2019), raising questions as to why these teachers were not more positive about their efficacy to teach writing. Future research should explore the linkages between efficacy, education, and preparation to teach writing by teachers of DHH students.

Also, as anticipated, teachers of DHH students were slightly positive about writing, with two out of every three teachers expressing this sentiment to some degree. The participating

teachers' attitude towards writing mirrored those of their general education peers, who also expressed slightly positive beliefs about writing in previous investigations (Brindle et al., 2016; Hsiang & Graham, 2016; Hsiang et al., 2018; Hsiang et al., 2020). The finding that teachers of DHH students are generally positive about writing needs to be replicated in future research. Their general education peers commonly agree they enjoy teaching writing (Cutler & Graham, 2008; Gilbert & Graham, 2010; Hsiang & Graham, 2016; Hsiang et al., 2020).

Participating teachers' epistemological beliefs about writing were generally consistent with our predictions. As a group, they slightly agreed that learning to write involves effort and process, and moderately disagreed that writing development is innate or fixed. They slightly disagreed that knowledge about writing is certain, but contrary to our hypotheses, they were ambivalent about whether writing knowledge comes from authorities and experts. In all studies conducted to date (Graham et al., 2020; Hsiang et al., 2020), including this one, teachers in the United States and the Greater China Region agreed that writing development requires effort and process and that writing knowledge is not certain. However, teachers in the present study were more adamant than general education teachers in previous studies that writing development was not innate or fixed, and they were ambivalent about whether they or experts were better sources of writing knowledge. If these findings are replicated, it is important for future research to determine why teachers of DHH students place less faith in the knowledge of authorities and experts than general education counterparts, and why they place less credence in the concept that learning to write is an innate or fixed ability. Such differences in beliefs are likely related to their experiences in teaching students who are identified as DHH, their preparation to teach writing, and the writing capabilities of the students they teach. Teaching writing to students identified as DHH is challenging due to their unique and diverse language needs (Dostal et al., 2019). This

may color their teachers' views on how writing is acquired and the adequacy of different sources of knowledge about writing and teaching it.

Writing Practices

Although 80% of participating teachers were positive about their preparation to teach writing, 86% indicated they were confident about their efficacy to teach writing, 64% were positive about their own writing capabilities, and 84% believed that writing development depended on effort and process, they did not frequently teach students identified as DHH writing skills, processes, or knowledge nor did they apply activities to support students' writing very often. As predicted, most teachers used the instructional practices queried at least some time during the school year, but they applied these activities relatively infrequently (once a month on average). Some activities, however, did occur (on average) more often than this. Teachers reported they provided praise/reinforcement for writing daily. They also indicated they assigned independent writing, set goals and provided feedback for students' writing, asked students to complete prewriting activities before writing, and taught planning, grammar, and the differences between ASL and English grammar at least weekly. While these findings differ in terms of how often specific procedures such as planning instruction was applied, they are similar to elementary grade general education teachers' reports on how they teach writing in the United States (e.g., Cutler & Graham, 2008; Gilbert & Graham, 2010).

The basic picture of writing instruction for students identified as DHH that emerges from the current study is that they write independently at least weekly and teachers commonly use several procedures to facilitate this process (goals, feedback, and prewriting activities). Writing instruction mostly focuses on teaching grammar and how to plan compositions (this was also evident in teachers in a business as usual group in an intervention study by Wolbers et al., 2018).

It is possible that the emphasis placed on teaching planning in this study, however, was inflated because six of the teachers had formerly applied a program that placed considerable emphasis on this practice. In any event, additional research is needed to replicate these findings and to determine if they generalize to a random selection of elementary grade teachers of DHH students. This includes querying teachers about more than just the 22 writing instructional activities studied here. Just as importantly, research is needed to determine if a similar pattern of findings is obtained when teachers' writing instruction is observed and not surveyed. Teachers also need to be interviewed to determine why and how often they apply specific writing instructional procedures.

Teacher Efficacy Predicts Reported Writing Instructional Practices

As expected, teacher efficacy predicted teachers reported writing practices after first controlling for attitude towards writing and epistemological beliefs about writing development and writing knowledge. Participating teachers' confidence in their ability to teach writing accounted for a unique 12.5% of the variance in how often they reported teaching writing using specific practices and 18.7% of the unique variance in how frequently they reported using specific activities to support students as they write. These findings are consistent with other studies with general education teachers showing that efficacy predicts how writing is taught (e.g., Bañales et al., 2020; Brindle et al., 2016; De Smedt et al., 2016; Gilbert & Graham, 2016; Reitdijk et al., 2018). This is the first study to our knowledge examining if teacher efficacy predicts the writing practices of teachers working with students with special needs. It is just the second study examining if teacher efficacy predicts writing practices after first controlling for attitude towards writing and epistemological beliefs (Hsiang et al., 2020). Both this and the prior study found this to be the case.

Contrary to predictions, we did not find that attitude towards writing or teachers' epistemological beliefs about writing were unique and statistically significant predictors of teachers' writing practice. This stands in contrast to a study conducted by Hsiang et al. (2020) with grades one to three general education teachers in Taiwan where these beliefs did predict how writing was reportedly taught. There are many possible reasons for the different outcomes in these two investigations. The studies differed in terms of grade level (later elementary grades vs primary grades), type of teacher (teachers of a special population vs general education teachers), culture (United States vs Greater China Region), sample selection (convenience vs random sample), sample size (44 teachers v 782 teachers), and writing practices assessed (22 activities vs 46 activities). The study in Taiwan also controlled for other writing beliefs, including attitude toward teaching writing, instructional orientation towards teach writing, and judgements about students' progress, not assessed in the present investigation due to sample size. One or more of these variables and/or in combination with other factors (e.g., teachers' knowledge about writing) may be responsible for the conflicting findings.

Additional research is needed to replicate and extend the findings from this study. This includes conducting an investigation with a larger sample of teachers of students identified as DHH, expanding the number of writing activities assessed, and applying a broader range of teacher beliefs as predictors, control variables, or both. Further, observing teacher practices instead of surveying them would strengthen any future investigation, but this is also likely to constrain who and how many teachers participate in the study.

Limitations and Implications

While we were able to include teachers from 15 different states in this study, our sample size was relatively small ($N = 44$). The participating teachers were also highly educated, as 84%

of them had at least a Master's degree. This needs to be taken into account when interpreting the findings of our investigation.

This study was further based on the assumption that teachers are aware of how they teach and, consequently, they can accurately answer questions about their instructional practices. While independent observation of teacher practices is preferred, there is evidence that teachers can accurately answer questions about how they teach literacy (e.g., Bridge & Heibert, 1985).

We further assumed that teachers understood the basic concepts underlying each item in our survey. While we cannot guarantee that this was always the case, virtually all of the items on the survey administered in this study had been previously field tested and applied in other studies without problems.

Caution must always be applied when drawing implications for practice from descriptive and correlational data. Even so, we think the following implications are warranted. First, teacher efficacy is an important teacher characteristic that directly and indirectly influences teachers' practices (Zee & Koomen, 2016). While most teachers in this study indicated they were confident in their capabilities to teach writing, there was considerable room for growth. Efficacy is a malleable construct (e.g., Dillard, 2014; Oh, 2011), and teachers' efficacy for writing should become a focal point in both preservice and inservice preparation for teachers of DHH students.

Second, it is unlikely that the instructional procedures that teachers reportedly applied in this study were adequate for ensuring that elementary grade students identified as DHH develop the writing skill needed for school, occupational, and community success. These students commonly experience significant difficulties learning to write (e.g. Strassman & Schirmer, 2012; Williams & Mayer, 2015), and a more intensive and extensive writing program is needed if we are to maximize their development as writers.

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Table 1

Correlations between Reported Writing Practices, Teacher Efficacy, Attitude towards Writing, Epistemological Beliefs, and Years Teaching

	1	2	3	4	5	6	7
1. Teaching writing	-						
2. Supporting writing	.763**	-					
3. Teacher efficacy	.325*	.361*	-				
4. Attitude towards writing	.243	.215	.319*	-			
5. Innate/fixed	.109	.146	.083	-.132	-		
6. Effort/process	.007	.088	.554**	.239	.032	-	
7. Authority/expert	.087	.056	.321**	.143	.399**	.587**	-
8. Certain knowledge	-.105	.042	.091	-.087	.532**	-.007	.338*

* $p < .05$. ** $p < .01$

Table 2

Multiple Regression Analysis for Teaching Writing

	B	SE	β	T	p
Model 1					
Constant	4.139	1.301		3.180	.003
Attitude towards writing	.252	.149	.268	1.690	.099
Innate/fixed	.318	.260	.234	1.222	.229
Effort/process	-.183	.273	-.134	-.670	.507
Authority/expert	.134	.254	.115	.526	.602
Certain knowledge	-.362	.271	-.245	-1.135	.190
Model 2					
Constant	3,527	1.248		2.826	.008
Attitude towards writing	.161	.145	.171	1.113	.273
Innate/fixed	.270	.245	.198	1.101	.278
Effort/process	-.523	.292	-.381	-1.792	.081
Authority/expert	.189	.240	.162	.789	.435
Certain knowledge	-.431	.256	-.292	-1.681	.101
Teacher efficacy	.607	.247	.439	2.457	.019

Note. Coefficients are standardized; Model 1 accounted for 12.5% of the variance ($p = .382$); Model 2 accounted for an additional 12.3% of the variance (*sig f change* = .019)

Table 3

Multiple Regression Analysis for Supporting Writing

	B	SE	β	T	p
Model 1					
Constant	2.936	1.239		2.370	.023
Attitude towards writing	.209	.142	.239	1.474	.149
Innate/fixed	.295	.248	.233	1.189	.242
Effort/process	.118	.260	.092	.453	.653
Authority/expert	-.127	.242	-.117	-.525	.603
Certain knowledge	-.030	.258	-.022	-.117	.908
Model 2					
Constant	2.418	1.208		2.002	.053
Attitude towards writing	.132	.140	.151	.944	.351
Innate/fixed	.254	.238	.200	1.069	.292
Effort/process	-.170	.282	-.133	-.601	.552
Authority/expert	-.080	.232	-.074	-.344	.732
Certain knowledge	-.088	.248	-.064	-.357	.723
Teacher efficacy	.514	.239	.399	2.150	.038

Note. Coefficients are standardized; Model 1 accounted for 8.6% of the variance ($p = .616$); Model 2 accounted for an additional 18.7% of the variance ($sig\ f\ change = .038$).