

A National Perspective on Teachers' Efficacy Beliefs in Deaf Education

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Teachers' sense of efficacy, or the belief that teachers have of their capacity to make an impact on students' performance, is an unexplored construct in deaf education research. This study included data from 296 respondents to examine the relationship of teacher and school characteristics with teachers' sense of efficacy in 80 different deaf education settings in the US. Deaf education teachers reported high overall efficacy beliefs but significantly lower efficacy beliefs in the area of student engagement than in instructional strategies and classroom management. Teachers' years of experience showed a significant relationship with efficacy beliefs, yet it was the teachers' perceived collective efficacy of their educational setting that ultimately predicted teachers' sense of efficacy. These findings lend credence to the need for further examination of school processes that influence teacher beliefs and attitudes in deaf education settings.

Over the last 3 decades, the literature supporting the need to investigate teacher beliefs and attitudes as essential components involved in students' learning and achievement outcomes has been steadily increasing. A conceptualization of teacher beliefs that is prominent in this literature is that of teachers' efficacy beliefs, beliefs that the teacher holds about their capacities to make a difference in student outcomes. Teachers' efficacy beliefs are an unexplored construct in the field of deaf education and offer a new lens through which to examine the complex dynamics involved in deaf education settings. This new lens offers a perspective that moves beyond a view of deaf students' deficiencies to capturing a broader picture of teacher attitudes and beliefs, using the framework of teachers' self-efficacy, in the educational setting in which deaf students learn.

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Self-efficacy Theory

"Self-efficacy" is a prominent aspect of social cognitive theory that allows for a closer examination of the relationship between individual beliefs and behavior. Bandura (1997), defined self-efficacy as the belief that one has of one's capabilities to successfully organize and execute a desired course of action. Bandura maintained that self-efficacy beliefs, or perception of ability, are often the strongest predictor of resultant behavior, even more so than one's actual ability. Individuals with a strong sense of self-efficacy have been found to take on challenging tasks willingly (Bandura & Schunk, 1981), show increased persistence (Bandura & Schunk, 1981; Locke & Latham, 1990; Schunk, 1982), exert greater effort (Salomon, 1984), have lower anxiety (Meece, Wigfield, & Eccles, 1990; Pintrich & De Groot, 1990), self-evaluate their academic performance accurately (Bouffard-Bouchard, 1990), and self-regulate better than others (Zimmerman, Bandura, & Martinez-Pons, 1992; Zimmerman & Martinez-Pons, 1990).

Self-efficacy is often domain specific, reflecting a perceived capacity for tasks required in a specific context (Bandura, 1997). For teachers, the specific context is one's educational setting. The school as a professional context is multifaceted and includes policies, facilities and resources, colleagues, supervisors, students, and parents, to name a few. Teacher self-efficacy in this context thus includes a teacher's sense of capacity to facilitate learning with these students and in this setting. In this article, we conceptualize teachers' sense of efficacy as the belief that the teacher has of their capacity to successfully organize

and execute tasks required to have a positive impact on students and their achievement.

The research literature supports the finding that teachers' perceived efficacy has a strong influence on teacher behavior in the classroom, especially in teachers' level of effort, perseverance through difficult situations, and the goals they set. Teachers with a strong sense of efficacy are open to new ideas and willing to experiment with and apply new strategies to meet students' needs (Berman, McLaughlin, Bass, Pauly, & Zellmann, 1977; Ghaith & Yaghi, 1997; R. Guskey, 1988; Ross, 1998; Stein & Wang, 1988). Perhaps connected to openness toward innovation in pedagogy, teachers with strong levels of self-efficacy exhibit greater enthusiasm for teaching (Allinder, 1994; T. Guskey, 1984). Noncontent area but critical skills such as levels of planning and organization (Allinder, 1994) and classroom management strategies are also found in teachers reporting higher efficacy beliefs (Woolfolk & Hoy, 1990; Woolfolk, Rosoff, & Hoy, 1990). Generally, teachers with high efficacy beliefs believe that they can influence student learning, even when faced with students who may be more challenging to teach (Guskey & Passaro, 1994). Those teachers are less critical of students (Ashton & Webb, 1986), show more persistence in working with low achieving students (Gibson & Dembo, 1984), and are less likely to refer students to special education (Meijer & Foster, 1988; Podell & Soodak, 1993; Soodak & Podell, 1994). These findings suggest that teachers who believe that their actions are making a difference in student learning exhibit behaviors that may then facilitate positive outcomes for students.

Teachers' sense of efficacy appears to be linked to greater academic success for their students. Countless studies reveal that teachers' sense of efficacy has a positive relationship with student outcomes such as student achievement (e.g., Armor et al., 1976; Ashton & Webb, 1986; Bandura 1977, 1993; Gibson & Dembo, 1984; Moore & Esselman, 1992; Ross, 1992, and Tschannen-Moran & Hoy, 2001), motivation (Midgley, Feldlaufer, & Eccles, 1989), and student engagement (Good & Brophy, 2003). Clearly, teachers' sense of efficacy is a construct that consistently shows significant relationships with outcomes of interest in both dimensions: teaching and learning. It is necessary to acknowledge that teachers' efficacy beliefs are not only

important but also a malleable construct that can be influenced by changes in educational settings (Chester & Beaudin, 1996; Tschannen-Moran & Hoy, 2007).

School Setting: Collective Efficacy

When examining teacher beliefs and attitudes, the environment in which the teacher works cannot be neglected, especially when considering that self-efficacy beliefs are context sensitive. Teachers work in a wide range of settings, from small private schools to large public programs and have to adapt to variations in teaching environments and student populations that are inherent in those settings. However, the literature on self-efficacy beliefs show findings that move beyond the specific contextual variations in school settings and give us a picture of environments that may be conducive to stronger efficacy beliefs. Higher self-efficacy beliefs are exhibited in teachers that perceive their school setting to have a positive atmosphere, fewer impediments to teaching, and shared decision-making responsibilities (Moore & Esselman, 1992). Teacher beliefs about the expectations of student academic achievement shared by other staff (Hoy & Woolfolk, 1993) and the level of collaboration among teachers (Rosenholtz, 1989) were also highly correlated with teachers' sense of efficacy. The leadership style of administrators is also linked to teachers' self-efficacy beliefs. Principals adopting transformational practices, such as motivating and inspiring their employees, are more likely to have teachers with higher efficacy beliefs in their schools than those principals who adopt transactional practices such as a focus on rewards and goal-meeting (Hipp, 1996; Hipp & Bredeson, 1995). The single greatest predictor of teachers' sense of efficacy in a 1991 study was the teachers' sense of community in a school (Lee, Dedick, & Smith, 1991). Teachers' belief of their capacity to make an impact on student achievement is clearly influenced by the environment in which the teaching happens.

The findings above support the need for further investigation of how teachers' beliefs and attitudes about the school setting are related to teachers' sense of individual efficacy in their own teaching. Group-referent beliefs and attitudes about shared settings,

including atmosphere, shared decision making, expectations, and collaborativeness, can be conceptualized as “perceived collective efficacy” beliefs (Bandura, 1997; Goddard, Hoy, & Woolfolk Hoy, 2000). Bandura defines perceived collective efficacy as those beliefs held by group members about “the performance capability of a social system as a whole” (1997, p. 469). Within schools, perceived collective efficacy refers to the beliefs that teachers hold about the potentials of the faculty and staff to successfully organize and execute tasks or actions required to have a positive effect on students.

Strong relationships have been found to exist between teachers' individual efficacy beliefs and the collective efficacy beliefs held by teachers about their school setting (Goddard & Goddard, 2001; Goddard et al., 2000). Goddard et al. (2000) believe, “the effect of an individual teacher's efficaciousness may be either attenuated or enhanced depending on the level of collective efficacy in a school” (p. 498). In fact, collective efficacy was found to be the only statistically significant predictor of teacher efficacy variation among schools and accounted for all the variation between schools surveyed, above and beyond other contextual variables such as socioeconomic status and student achievement (Goddard & Goddard, 2001). The impact of teachers' perceived collective efficacy of the school setting may be strong enough to impede, or alternatively, enhance teachers' sense of efficacy.

Teacher Efficacy and Deaf Education

Aside from teacher preparation, teachers' sense of efficacy is one of the few teacher characteristics consistently related to student achievement (Armor et al., 1976; Ashton & Webb, 1986; Bandura 1977, 1993; Gibson & Dembo, 1984; Moore & Esselman, 1992; Ross, 1992, and Tschannen-Moran & Hoy, 2001). In the field of deaf education, deaf students' poor achievement levels are an oft-debated topic. Test assessment results, most namely those of the Stanford Achievement Tests, show that deaf students' norms lag behind those of their hearing peers as much as or more than six grade levels below the norm (Traxler, 2000; Qi & Mitchell, 2011). Educational researchers working within the field of deaf education are working to

counteract this discrepancy and identify key factors that can rectify the achievement gap between deaf children and their peers. As one of the most significantly malleable factors within educational settings, specific attention needs to be paid to the role of the teacher in deaf education and ways to strengthen their capacities (Luckner, 2006). Marschark, Lang, and Albertini (2002) also suggested that teacher factors might account for a considerable variability in deaf students' achievement across all levels of learning.

If strong self-efficacy leads to higher student outcomes, it is plausible that low achievement of deaf students has a relationship with diminished efficacy beliefs in deaf education teachers. Teachers with low efficacy beliefs may feel that they lack the power to improve students' achievement, if faced with difficulty may give up easily and have a tendency to blame extenuating circumstances (Ashton & Webb, 1986, Bandura, 1997). The literature on teaching efficacy in the context of working with low-achieving students or students at risk does not give us a clear picture of the relationship between students' achievement and teachers' sense of efficacy in these populations, but it appears that teaching experience may influence this relationship. A research study in Singapore done specifically with teachers who teach low-achieving students shows as teachers gain experience, they report higher levels of teacher efficacy (Yeo, Ang, Chong, Huan, & Quek, 2008).

Teacher Beliefs in Deaf Education

Teacher attitudes and beliefs are an underexplored construct in deaf education research, but there are some starting points. Studies that show deaf education teachers have a higher tendency to exhibit teaching orientations of subordination (Marlatt, 2002), potentials of lower expectations in deaf education settings (Marlatt, 2004b; Pagliaro & Kritzer, 2005; Wood, 1998) and that deaf education training programs rely heavily on behaviorist classroom management techniques (Teller & Harney, 2005) lead us to further question the role of the teacher in deaf education. Studies conducted in postsecondary settings exhibited that teachers working with deaf students in separate or mainstream settings reported differing attitudes

toward teaching, with those in separate settings adopting student-focused approaches to teaching and greater focus on conceptual change, while those in mainstream settings were more likely to utilize an information transmission approach (Marschark, Richardson, Sapere, & Sarchet, 2010). Brown and Paatsch (2010) posit that deaf education teachers working in oral settings, specifically, do reveal a strong relationship between their underlying beliefs and the model of practice that is adopted. However, their study did not account for contextual factors such as student learning characteristics or the expectations of the instructional setting that could be playing a role in teacher beliefs and practice.

Teachers' perceived efficacy has a relationship with images that teachers hold of themselves, their teaching, and their students, serving as schemata in teachers' conceptual knowledge through which experiences are embodied, filtered, and expressed. It has been proposed that teachers' sense of efficacy is related to their orientation toward teaching, students, and instructional practices (Ashton & Webb, 1986; Woolfolk & Hoy, 1990). From one perspective, teaching orientations can be seen to fall on a continuum between custodial, where there is a high reliance on authoritarian, extrinsic inducements, and negative sanctions, to humanist, where there is a focus on the individual student and willingness to meet varying individual needs (Hoy, 2001). Teachers with a low sense of efficacy tend to favor a custodial orientation while teachers with a high sense of efficacy favor a more humanist orientation (Woolfolk & Hoy, 1990). The custodial orientation referred to was found to be the most prevalent classroom management and learning strategy used by deaf education teacher training programs, as reported by 88% of program directors in the nation (Teller & Harney, 2005). The potential interaction of teacher images with teachers' efficacy beliefs raise questions about the images that teachers hold of deaf students and how deaf education training programs may be playing a role in the formation of those images.

Teacher beliefs are often shaped by the pedagogy and philosophies of the places they receive their training. Marlatt (2002, 2004a, 2004b) undertook a series of studies of deaf education teachers' beliefs, images, and knowledge, surveying 163 preservice, novice, and

experienced teachers, all students or graduates of the same teacher training program. The 2002 study of teacher images revealed that deaf education teachers were more likely to view students as subordinates in need of supervision. A closer look at this finding showed that the beginning education teachers were more likely to view students as peers than as subordinates than the graduating education students, novice teachers, or experienced teachers. Marlatt suggests that this data shows that deaf education teachers may be socialized to view deaf students as subordinates over time, emphasizing the caregiving aspect of the teacher role. In the study on knowledge and practice among teachers of the deaf, it was reported that as they gained experience, teachers demonstrated lower expectations of their students (Marlatt, 2004b). While preservice teachers reported high levels of expectations in the areas of student achievement, students' ability to assume responsibility for classroom work, and classroom deportment, expert teachers had the lowest level of expectations. However, these studies neglected to account for a possible cohort effect and did not follow the teachers over time and account for temporal changes as would have been possible in a longitudinal study. We must also acknowledge that the participants in the Marlatt studies were all either students or graduates of the same teacher training program, so the specific characteristics of the training program could be confounding the results.

Shifting the perspective from a broad picture of expectations for student achievement toward a more narrow discussion of expectations within content areas for instruction, the likelihood of low expectations to be held are also found in the classroom context. In a survey of discrete mathematics knowledge and curriculum integration thereof in deaf education settings, data were collected from 290 teachers that revealed low expectations in these settings (Pagliaro & Kritzer, 2005). Teachers of the deaf stated that discrete mathematics topics were too "high level" for their students. When looking at the role of teacher experience, it was found that the expectations of students did not significantly vary between teachers with different levels of experience. These findings showing teachers' low expectations in deaf education settings across all levels of experience raise questions about the potential role of teacher beliefs on student outcomes.

Teachers' Years of Experience

One of the variables that consistently emerge as an important factor in the malleability of teacher beliefs and attitudes is that of time. Taking a closer look at the interaction of teacher experience with teachers' sense of efficacy, it appears that teachers' self-efficacy beliefs are most malleable early in learning and generally stabilize over time (T. Guskey, 1984; R. Guskey 1988; Pajares, 1992; Woolfolk Hoy & Murphy, 2001). For example, research by Soodak and Podell (1994) revealed that teachers experience a significant drop in efficacy levels during their first year of teaching. However, the change in self-efficacy beliefs in novice teachers is actually mediated by other variables such as the teacher's age, prior experience, and school practices such as attitudes, resources, and support available (Chester & Beaudin, 1996; Tschannen-Moran & Hoy, 2007). The complex dynamics of school settings necessitate an examination of contextual variables that may serve as mediators for change in self-efficacy beliefs in teachers over time.

When looking at how teacher attitudes and beliefs in deaf education settings are impacted by time and experience, we find that the expectations deaf education teachers have of their students appears to be lower with years of experience (Marlatt, 2004b). The link between teacher expectations and teachers' sense of efficacy has not been made empirically, but teacher expectations are a significant aspect of teacher attitudes and beliefs. If teachers have higher expectations of student achievement, this would seem to imply that teachers expect that they can make a difference in student achievement, which is one indicator of high-efficacy beliefs. The finding that deaf education teachers have lower expectations of their students over time is in contrast with studies that show teacher efficacy beliefs to either be higher with years of experience (Campbell, 1996; de la Torre Cruz & Arias, 2007; Wilson & Tan, 2004; Yeo et al., 2008) or stable over time (T. Guskey, 1984; R. Guskey 1988; Pajares, 1992; Woolfolk Hoy & Murphy, 2001). If deaf education teachers have lower expectations of students as they gain more experience, this finding leads us to hypothesize that these teachers could also report reduced efficacy beliefs over time.

Teacher–Student Relationship: Language

It is clear that teachers' self-efficacy beliefs interact with a diverse, complex set of variables including school-level differences such as collective efficacy beliefs, resources available, and level of collaboration, in addition to individual-level differences, such as years of experience and teacher training background. Differences worthy of attention in this specific context, deaf education, are the language of use in the school setting and the language proficiency of the teacher. When considering how language comes into play in educational settings for deaf students, it needs to be acknowledged that teachers' preexisting beliefs about language and communication methodology may also influence teacher beliefs on a broader scale that is unique to this setting. Language plays a large role in deaf education, with language use in settings running the gamut from entirely auditory-verbal, mediated through sign language interpretation, or bilingual ASL/English programs. And those settings often realistically include an array of language choices and opportunities for deaf students, taking place in different contexts. It is not only language choice that comes into play in these settings but also the varying levels of language proficiency used by the professionals in these settings that make an impact on the quality of language and communication that is present.

The role of language becomes especially significant when considering that language actually forms the mainstay of the relationship between the teacher and the student, facilitating communication on multiple levels. A study of efficacy beliefs in teachers who work with low-achieving hearing students in Singapore found that "conflict in the teacher–student relationship inversely predicts teacher efficacy in classroom management and instructional strategies" (Yeo et al., p. 202). This is especially significant because the deaf educator's primary challenge is often that of language and communication with their students, which is an essential factor in the teacher–student relationship. The population of interest in the Yeo et al. study, low-achieving students, supports further comparisons to the population of interest in this study, deaf students who also happen to have concurrent histories of low achievement.

To better understand the role of linguistic diversity in teacher efficacy beliefs, it is also beneficial to look at research on regular education teachers who work with English language learners. In a study of elementary teachers working with students of varying language backgrounds, the researchers posit that students' language backgrounds ultimately play a significant role in teachers' efficacy perceptions (Tasan, 2001). The results of this study found that the teachers reported the highest efficacy beliefs with English using students, then the non-English using students, and finally the nonstandard English using students. In special education settings where teachers work with students with disabilities, teachers reported feeling least efficacious when working with those students who were culturally and linguistically diverse (Carlson, Brauen, Klein, Schroll, & Willig, 2002). From these findings, it can be seen that the variation in students' language backgrounds plays a role in teacher beliefs of whether or not their teaching makes a difference in student learning.

In an examination of how language influences teachers' perceptions of their efficacy, it is important to also consider the teachers' proficiency of the language being used in the setting. In a study of efficacy beliefs in teachers working with English language learners with disabilities, Paneque and Barbeta (2006) found that the most statistically significant predictor of efficacy beliefs was the teacher's proficiency in the native language of the students. Other studies in English language learning settings where the teachers are not native users of English have found that as the teacher's English language proficiency increases, the teachers' perceived efficacy for motivating students and designing instruction increases (Chacón, 2005). These studies show that the teachers' proficiency in the language used by their students and the language being taught interact with teachers' efficacy beliefs. Despite the paucity of studies about the efficacy beliefs of teachers who work with deaf students and the influence of language in those settings, it can be inferred from the literature on how language interacts with teachers' efficacy beliefs in varying educational settings that language does matter.

Aims of This Study

This study took an explorative approach to investigating teachers' sense of efficacy in deaf education.

Initially, the goal of this study was to capture a broad picture of teachers' perceptions of their teaching efficacy when working with deaf students. A conceptualization and measure of teachers' sense of efficacy was used that allows for a closer look at the three dimensions of efficacy and how those may be manifested in the deaf education teacher's perceptions: student engagement, instructional practice, and classroom management. A scale of collective efficacy measured teachers' beliefs about the school setting as a contextual variable of interest. Regression analyses allowed for an investigation into what individual and contextual variables predicted teachers' sense of efficacy in deaf education settings.

Specific research questions to be answered are below:

1. What is teachers' sense of efficacy in deaf education settings?
2. How do individual-level factors (teacher experience, time spent working directly with deaf students, hearing status, and ASL proficiency level) interact with teachers' sense of efficacy in deaf education settings?
3. How do school level factors (perceived collective efficacy, program enrollment, and language used in the setting) interact with teachers' sense of efficacy in deaf education settings?
4. What significant individual and/or school-level factors predict teachers' sense of efficacy in deaf education settings?

Method

Recruitment

This project was a quantitative analysis of participant responses using an online survey instrument. The goal was to recruit participants from a wide range of academic settings. To that aim, recruitment for this national survey of deaf education teachers occurred through several different channels. Participants were recruited through researchers' personal contacts in deaf education settings, national and state deaf education email listservs, and targeted contacts to larger school settings representative of a range of approaches such as oral-only programs, mainstream programs,

and stand-alone schools for the deaf. This multipronged approach resulted in representation from a broad range of educational settings that serve deaf students. All invitations included a request to share the invitation with colleagues in the field of deaf education and, through a snowball effect, resulted in nearly 300 respondents. There is not available data on the number of teachers in the nation who work with deaf students, which does not allow for a determination of what percentage of the true population is captured in this study. However, comparable national studies collecting data from deaf education teachers have similar sample sizes ($n = 314$; 391) (Cawthon, 2009; Cawthon & Wurtz, 2008). The suggested rule of 15 responses per predictor in multiple regression analyses to allow for the generalizability of findings (Stevens, 2009) shows our sample size ($n = 296$) to be more than sufficient.

Instruments. The first section of the survey collected demographic data of the participants and the educational setting, asking teachers to consider their experiences when working with deaf students in particular. The participant demographic characteristics collected include position, training background, years of experience teaching, time spent working directly with deaf students, hearing status, and proficiency in American Sign Language, referring to the Sign Communication or Language Proficiency Interview levels of proficiency (SCPI/SLPI, Caccamise & Newell, 1995). The school setting characteristics collected include program enrollment of deaf students, language used, and size of program.

The second section of the survey utilized the Teachers' Sense of Efficacy Scale (TSES), as developed by Tschannen-Moran and Hoy (2001) to assess both teacher competence and task demands in specific teaching contexts. This 24 item TSES measures three subscales of teacher efficacy beliefs: efficacy in student engagement, efficacy in instructional strategies, and efficacy in classroom management. Factor analyses show high reliabilities for those subscales (engagement, instruction, and management) ranging from 0.72 to 0.86, offering strong reliability for those three components of teachers' efficacy beliefs. Second-order factor analyses also show high reliability, with factor loadings from 0.74 to 0.84, allowing us to use this scale to measure the underlying construct of efficacy as well as the subscales of efficacy.

This scale asks teachers to respond to a variety of questions about beliefs of teaching, such as, "How much can you do to foster student creativity?" The available responses about how much teachers feel that they are able to do are on a Likert scale that allows responses from *nothing*, *some influence*, or *a great deal*. The TSES has good internal reliability, with Cronbach's alphas from 0.81 to 0.86 (Tschannen-Moran & Hoy, 2001).

The third section of the survey utilizes the short version of the Collective Efficacy Scale (CE-Scale), as developed by Goddard (2002a, 2002b). This instrument measures collective efficacy beliefs held by teachers about their educational setting. This scale asks teachers to respond to a variety of questions about teacher attitudes or beliefs in their educational setting, such as, "Teachers in this school believe that every child can learn." The responses are on a Likert scale from *strongly disagree* to *strongly agree*. The CE-Scale has strong validity and internal reliability, with a Cronbach's alpha of .94 (Goddard 2002a, 2002b).

Participant demographics. The data set consists of 296 participants who completed the full survey and were teachers or administrators who worked directly with at least one deaf student in the academic year of 2009–2010. The majority of our respondents spent the entire week working directly with at least one deaf student, with 60.4% of respondents stating that they worked more than 26 hr a week directly with deaf students. A small number (6.7%) of respondents stated that they worked directly with deaf students only 1 to 5 hr a week. Survey participants worked in a variety of roles in the instructional setting: from high school to early childhood, special education, content areas, administration, and as itinerant teachers. The majority of participants, 46%, had more than 10 years of teaching experience with students who are deaf, whereas 20.5% had from more than 5 to 10 years of experience, 25.2% had more than 1 to 5 years of experience, and 8.4% had a year or less of experience. The majority of respondents were hearing (68.5%), and 31.5% were deaf or hard of hearing.

Over 85% of respondents received formal training in deaf education. Participants were almost equally divided on whether or not they had received formal training in bilingual ASL/English education, with

51.7% of the respondents having none and 48% with some level of formal training. To collect information on language proficiency, teachers were asked to report their level of proficiency with ASL, referring to Sign Communication or Language Proficiency Interview scores (SCPI/SLPI, Caccamise & Newell, 1995) when available. The majority of respondents reported ASL proficiency levels (97.6%), with 36.1% of the participants reporting superior levels, 34.7% advanced, 13.4% intermediate, 7.9% survival, 4.5% novice, and 3.4% no functional skills.

Educational setting. The 296 study participants worked in an extensive variety of educational settings, including residential schools for the deaf, oral programs, and mainstream programs. Over 80 different schools and programs were represented in the respondents of this survey. Respondents worked in educational settings serving a wide-ranging numerical range of deaf students: from 1 to 5 to more than 400 students in the school or program. The largest number of the respondents, 26.6%, worked in settings that had more than 300 deaf students enrolled. Smaller programs were also represented well in this sample, with 23.6% of respondents working in settings with 1 to 30 deaf students enrolled. American Sign Language only was used by 43.3% of the respondents in instructional settings with deaf students, whereas 41.9% used mixed methods including, but not limited to, ASL, signed communication, signed and oral communication together, oral communication, and signed language interpreters. A smaller percentage, 13.8%, used oral methods only, and 1% only used a sign language interpreter.

Results

Deaf Education Teachers' Sense of Efficacy

Internal consistency estimates of reliabilities were computed for the Teachers' Sense of Efficacy Scale, shown

in Table 1, indicating satisfactory reliability when used with this population. Deaf education teachers in this sample reported efficacy beliefs on the high end of the scale, with an overall mean of 7.41, measured on a scale from 1 to 9. Teachers' reported efficacy scores were further broken down into the subscales of classroom management, instructional strategies, and student engagement, as shown below in Table 1. We are examining both the overall teachers' sense of efficacy score as well as the subscale scores, as previous factor analyses show both the first-order factors of these subscales (management, instruction, and engagement) and second-order factor of the underlying construct of teacher efficacy to be reliable (Tschannen-Moran & Hoy, 2001).

A repeated-measures analysis of variance (ANOVA) was conducted as an overall test of differences to evaluate whether deaf education teachers had different efficacy beliefs in each of the subscales. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(2) = 6.20, p < .05$, therefore multivariate tests are reported ($\epsilon = .98$). The results show that teachers' efficacy beliefs are significantly different among the subscales, $V = .34, F_{2, 294} = 75.59, p < .001$.

Post hoc tests using the Bonferroni correction were conducted to examine differences among the subscales. The results indicated that within this study sample, the mean sense of efficacy in instructional strategies was higher than the mean sense of efficacy in classroom management (7.63 vs. 7.41) and student engagement (7.63 vs. 7.14), which were statistically significant ($p < .001$). The mean sense of efficacy in classroom management was also higher than the mean sense of efficacy in student engagement (7.46 vs. 7.41), which was statistically significant ($p < .001$).

Relationship of Teacher Characteristics with Efficacy Beliefs

Correlation coefficients were computed between the overall TSES score, TSES subscale scores, and the

Table 1 Descriptive statistics of teachers' sense of efficacy and subscales

	Mean	Standard deviation	Cronbach's coefficient alpha
TSES classroom management	7.46	1.27	0.94
TSES instructional strategies	7.63	1.09	0.93
TSES student engagement	7.14	1.16	0.91
TSES overall	7.41	1.09	0.97

Note. $N = 296$.

individual-level variables of interest in this study, as shown in Table 2. The results of the correlational matrix presented show that teacher experience had the only significant relationships with teachers' overall sense of efficacy. Further breaking down of teachers' sense of efficacy into subscales of student engagement, instructional strategies, and classroom management shows continued significant relationships with years of experience. A small significant relationship was found between hearing status of the teachers and teachers' sense of efficacy in instructional strategies, which revealed that hearing teachers were more likely than deaf teachers to report a stronger sense of efficacy in instructional strategies.

Teachers' sense of efficacy was not significantly associated with the following teacher demographic variables: time spent working directly with deaf students, hearing status, or ASL proficiency level.

To take a closer look at the relationship of teacher experience with teachers' sense of efficacy, a one-way independent analysis of variance was conducted. This ANOVA allowed for an examination of the difference in teachers' sense of efficacy scores among groups of teachers who vary in years of experience: first year teachers (1 or less), novice teachers (more than 1 to 5), experienced (more than 5 to 10), and most experienced (more than 10). Results showed that there was a significant main effect of teacher experience on levels of teachers' efficacy beliefs, $F_{3, 292} = 2.73, p < .05$. The assumption of homogeneity of variance was tested using Levene's test, which showed no violation. Post hoc tests were conducted to compare all the groups, using the Bonferroni correction to control for the family-wise error rate. The only significant difference between groups of teachers among years of experience was found between more experienced teachers and novice teachers (mean difference = .39, 95% confidence interval = .77, .02, $p < .05$). This indicates that teacher

years of experience had a noticeable effect on teachers' efficacy beliefs, with the most experienced teachers reporting significantly higher efficacy beliefs than the novice teachers. A line graph is depicted in Figure 1 that shows the relationship between years of experience and efficacy beliefs in deaf education teachers.

Relationship of School Setting Characteristics with Efficacy Beliefs

Correlation coefficients were computed between the overall TSES score, TSES subscale scores, and the school-level variables of interest in this study, as shown in Table 3. The results of the correlational matrix presented in Table 3 show that teachers' perceived collective efficacy of the school setting had the only significant relationships with teachers' overall sense of efficacy. Further breaking down of teachers' sense of efficacy into subscales of student engagement, instructional strategies, and classroom management shows continued significant relationship with teachers' perceived collective efficacy of the school setting.

Teachers' sense of efficacy was not significantly associated with the following school-level variables: program enrollment or language used in the setting.

Predictors of Teachers' Sense of Efficacy

A multiple regression was conducted to predict teachers' overall sense of efficacy scores from individual-level and school-level characteristics that showed significant relationships with teachers' overall sense of efficacy. The regression was conducted in two steps: first of which were a block of the individual-level predictors and the second block the school-level predictor of teachers' sense of efficacy, and the results are shown in Table 4.

The individual-level predictor of interest in this analysis is teachers' years of experience, categorized

Table 2 Correlations between TSES scores and individual-level variables

	Time w/deaf students	Years of teaching experience	Hearing status	ASL proficiency level
Overall TSES	.11	.19**	.11	.08
Student engagement	.08	.15**	.09	.07
Instructional strategies	.11	.19**	.15*	.08
Classroom management	.11	.19**	.08	.08

Note. $N = 296$. Significant correlations (two-tailed): * $p < .05$, ** $p < .01$.

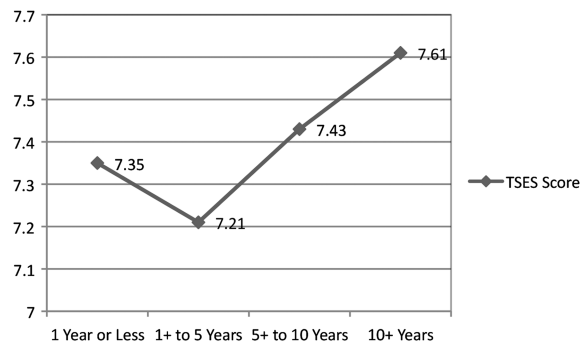


Figure 1 The relationship between teachers' sense of efficacy and years of experience.

in this study as first year teachers (1 year or less), novice teachers (more than 1 year to 5 years), experienced teachers (more than 5 years to 10 years), and more experienced teachers (10 years and more). As teacher experience is a categorical variable in this study, this variable was dummy coded to allow for the inclusion of teacher experience in a multiple regression analysis. The comparison group was first year teachers with 1 year of experience or less, as using this group as a reference group allows for an examination of how teachers' efficacy beliefs are influenced by their years of experience once they move past the first year of teaching.

The beta values in this first regression block represent the shift in teachers' sense of efficacy scores from first year teachers, compared with teachers who are novice, experienced, or more experienced. No group of teachers differed significantly from the baseline of first year teachers. Level of experience did not account for a significant amount of the variability of teachers' sense of efficacy scores, $R^2 = .026$, $F_{3, 289} = 2.62$, $p > .05$, as shown in Table 4. These findings indicate that only 2.6% of the variance in teachers' sense of efficacy can be explained by teacher experience.

The second step of the multiple regression analysis was conducted to evaluate whether the school setting

variable of perceived collective efficacy predicted teachers' sense of efficacy above and beyond participant demographic characteristics. Perceived collective efficacy accounted for a significant proportion of the variance of teachers' sense of efficacy scores, R^2 change = .07, $F_{1, 288} = 22.43$, $p < .001$. Perceived collective efficacy independently significantly predicted teachers' sense of efficacy scores, $p < .001$. These results indicate that as perceived collective efficacy increases, teachers' sense of efficacy increases. More precisely, standardized β of .27 for collective efficacy indicates that for each standard deviation increase in collective efficacy (0.61), teachers' sense of efficacy increases by .27 standard deviations. The standard deviation of teachers' sense of efficacy scores is .98 and so this constitutes a change of .26 (0.27×0.98). Therefore, if collective efficacy increases by 0.61, teachers' sense of efficacy can be expected to increase by 0.26. This interpretation is true only if the effect of teachers' experience is held constant. Results of these multiple regressions are shown in Table 4.

Discussion

This investigation aimed to take a closer look at deaf education teachers' beliefs and attitudes about teaching and the potential influence they have on student learning, using the conceptual framework that self-efficacy offers. Despite significant relationships between teacher experience and teachers' sense of efficacy, our results show that the contextual variable of teachers' perceived collective efficacy of the educational setting may be the best predictor of teachers' efficacy beliefs, above and beyond any individual characteristics of the teachers.

Generally, teachers who work with deaf students report overarching efficacy beliefs on the higher end of the scale, with an average score of 7.41 out of 9. This scale also captures the three dimensions of teachers'

Table 3 Correlations between TSES scores and school-level variables

	Program enrollment	Perceived collective efficacy	Language used in classroom
Overall TSES	-.01	.24**	.06
Student engagement	.03	.24**	.05
Instructional strategies	.02	.22**	.09
Classroom management	-.07	.19**	.03

Note. $N = 296$. Significant correlations (two-tailed): ** $p < .01$.

Table 4 Multiple regression results

	<i>B</i>	SE <i>B</i>	β
Step 1			
Constant	7.33	.20	
First year versus novice (1+ to 5 years)	-.11	.23	-.05
First year versus experienced (5+ to 10 years)	.11	.23	.05
First year versus most experienced (10+ years)	.28	.22	.14
Step 2			
Constant	5.51	.43	
First year versus novice (1+ to 5 years)	-.06	.23	.03
First year versus experienced (5+ to 10 years)	.14	.23	.06
First year versus most experienced (10+ years)	.28	.21	.14
Collective efficacy	.43	.09	.27***

Note. $R^2 = .026$ for Step 1 ($p > .05$), $\Delta R^2 = .07$ for Step 2 ($p < .001$). *** $p < .001$.

efficacy beliefs in instructional strategies, classroom management, and student engagement that “represent the richness of teachers’ work lives and the requirements of good teaching” (Tschannen-Moran & Hoy, 2001, p. 801). Including these dimensions of teachers’ efficacy beliefs allows for an examination of the complex dynamics involved in teaching in a variety of educational settings, and how teacher attitudes and beliefs may vary across those dimensions. The teachers in this sample had the lowest efficacy beliefs in the area of student engagement, and the highest efficacy beliefs in instructional strategies and classroom management.

To explore how deaf education teachers’ efficacy beliefs may differ from teachers working in other settings, we will refer to the results from the development and validation of this Teachers’ Sense of Efficacy Scale used in a sample of 410 teachers in Ohio (Tschannen-Moran & Hoy, 2001). The findings from this study found that teachers reported the highest efficacy beliefs in the dimensions of student engagement and instructional strategies and the lowest efficacy beliefs in classroom management. The teachers in the Ohio sample and our sample both reveal high efficacy beliefs in the dimension of instructional strategies but differ when looking at student engagement and classroom management. The finding that deaf education teachers in our sample reveal differences in efficacy beliefs when compared with teachers working in general education settings strengthen the rationale for examining how beliefs and attitudes in the teacher may present differently in deaf education settings.

It is possible that deaf education teachers face different challenges in the area of student engagement

when taking in consideration the highly diverse population of deaf students. Deaf students vary greatly in language use and proficiency and have increased probability of additional disabilities. The latest demographic data available from the Gallaudet Research Institute shows that 39% of deaf students have additional disabilities, which is yet another component that needs to be considered when looking at teachers’ relationship with their deaf students (Gallaudet Research Institute, 2011). Yet, it has been proposed that student engagement is a more complex, high-level task in teaching environments, where greater focus is often placed on classroom management and instructional strategies, most notably for the novice teachers (Meister & Melnick, 2003; Pigge & Marso, 1997; Tschannen-Moran & Hoy, 2007). This could suggest that teachers working with deaf students are dealing with extra challenges that may interfere with opportunities for teachers to attend to the more complex task of engaging with their students.

If deaf education teachers report higher efficacy beliefs in instructional strategies and classroom management than the teacher who works in general education settings, this supports previous findings that deaf education training programs place greater emphasis on the areas of classroom management, utilizing external sanctions and reinforcements in highly structured environments (Teller & Harney, 2005). Previous studies on teacher beliefs and attitudes in deaf education settings revealed that teachers are more likely to view students as subordinates, which may be reinforcing the perceived need for increased classroom management in instructional settings and

decreasing the value of building relationships with students (Marlatt, 2002). Putting all the above findings together, it appears that deaf education teacher training and instructional settings may prioritize instructional strategies and classroom management over student engagement.

Years of Experience

Analyses of teacher characteristics found that deaf education teachers with more than 10 years of teaching experience had significantly higher efficacy beliefs when compared with teachers who had more than 1 to 5 years of experience. This result aligns with previous work done in Spain (de la Torre Cruz & Arias, 2007), Singapore (Yeo et al., 2008), America, and Scotland (Campbell, 1996) revealing that more experienced teachers report higher levels of efficacy. Other studies show teachers' efficacy beliefs to hold stable through time, however (Chacón, 2005; T. Guskey, 1984; Pajares, 1992). Deaf education teachers' efficacy beliefs did not significantly differ among first year teachers or teachers with 6 or more years of experience, though, which leads us to consider that the specific period of years two to five of teaching may find teachers' efficacy beliefs fluctuating.

The first 5 years of teaching have been said to be critical periods of determining whether or not teachers will continue in the profession, and this appears to be a period of flux in our sample of teachers. National statistics show that 33% of teachers leave the profession within the first 3 years of teaching and 50% drop out within 5 years of teaching (Alliance for Excellent Education, 2004). As self-efficacy beliefs are related with persistence, decision-making, and goal commitment, there could be a relationship between teacher commitment and efficacy beliefs. Researchers who have examined the relationship of teacher commitment with teachers' efficacy beliefs find that those who leave teaching report lower efficacy beliefs than those who stay in the field (Glickman & Tamashiro, 1982). We did not directly inquire about commitment to the profession in our study, however, and cannot make that link here.

Despite the relationship of teachers' experience with efficacy beliefs, teacher characteristics did not play a significant role in predicting teachers' sense of

efficacy. The most significant predictor of teachers' sense of efficacy in deaf education was teachers' perceived collective efficacy of the educational setting. In regression analyses, results show a significant impact of as much as 27% of a standard deviation improvement in teachers' sense of efficacy with a one unit increase in collective teacher efficacy. Despite a considerable amount of unexplained variability in teachers' efficacy beliefs, our results show that the teacher's beliefs of the collective ability of the educational setting to make an impact on student outcomes significantly influences beliefs of their individual ability to make a difference in student outcomes. This finding is supported by previous work that indicates that novice teachers' drop in efficacy beliefs is actually mediated by other contextual variables such as the availability of school resources and verbal persuasion, defined as support from administrators, colleagues, parents, and other community members (Tschannen-Moran & Hoy, 2007).

Sources of Efficacy Beliefs

To consider how teachers' efficacy beliefs may be influenced by the school climate, the sources of efficacy beliefs will be addressed. It has been argued that the sources of individual and collective efficacy beliefs are actually similar (Bandura, 1986). Self-efficacy perceptions are formed from four sources: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states (Bandura, 1995). Bandura posited that mastery experiences are the most effective way of creating a strong sense of efficacy, through "acquiring the cognitive, behavioral, and self-regulatory tools for creating and executing appropriate courses of action to manage ever-changing life circumstances" (1995, p. 3). Vicarious experiences come into play when successful actions, skills, and attitudes are observed being utilized by social models that are perceived as similar and as acting in similar contexts. Social persuasion also serves as an effective way to increase beliefs in one's capabilities, and more specifically, increase the likelihood to exert greater effort and sustain it (Bandura, 1995). Finally, physiological and emotional states influence self-efficacy beliefs through the interpretation of physical status, stress, and emotional reactions.

It is likely that school climate has the power of enabling or suppressing the experiences posited by Bandura as essential components of forming teachers' efficacy beliefs. When considering that collective efficacy perceptions are higher in school settings where teachers have greater ownership of school directions in areas such as shared school goals, school-wide decision making, and fit of plans with school needs, it is possible that when the school climate allows for greater decision-making power by teachers, greater opportunities for ongoing mastery opportunities and experiences exist (Moore & Esselman, 1992; Ross, Hogaboam-Gray, & Gray, 2004).

When looking at mastery experiences on the collective level, the best proxy may actually be school achievement, as that is a school-level shared experience that can serve as an indicator of previous success. This is a complicated outcome to consider in deaf education settings, as teacher perception of student achievement of their deaf students may vary across settings and contexts. In larger stand-alone programs, achievement can be measured through test scores, whereas in smaller programs where deaf students consist only of one class, that achievement is more difficult to measure. However, it is important to address the finding that achievement levels of a school may have a reciprocal relationship with collective efficacy beliefs (Bandura, 1993; Goddard & Goddard, 2001; Goddard et al., 2000; Ross et al., 2004). Yet, other interactional situations in school settings such as collaboration and leadership can determine whether or not teachers interpret prior school achievement as evidence of mastery.

Vicarious experiences are another powerful source of self-efficacy beliefs, as learning happens from other social models that are performing in similar contexts and facing similar challenges. Teachers' sense of efficacy is significantly associated with the likelihood of collaborating with other teachers (Chester & Beaudin, 1996; Rosenholtz, 1989; Ross, 1992). Teachers' efficacy beliefs may be strengthened through engaging in collaborative help seeking, problem solving, and instructional experimentation that occurs when schools expect, or enable, highly collaborative environments with more potential for learning from other social models (Ross et al., 2004).

Social persuasion, one of the sources of self-efficacy, also takes place through collaborative work that can interact positively or negatively with teachers' efficacy beliefs. The emphasis on encouraging growth and new goals found in school settings where principals use transformational leadership, a commitment to supporting growth and elevating the goals of organizational members (Hipp, 1996; Hipp & Bredeson, 1995), creates settings with more highly efficacious teachers. The leadership styles of school administrators are a clearly critical aspect of social persuasion. The school climate can also influence psychological and emotional states, one of the sources of self-efficacy, as evidence shows that teacher stress negatively influences teachers' sense of efficacy (Brissie, Hoover-Dempsey, & Bassler, 1988; Greenwood, Olejnik, & Parkay, 1990). It is clear that school processes contribute significantly to the four sources of efficacy beliefs "by influencing teacher cognitions about mastery experiences, by providing opportunities for vicarious experience, through persuasion, and by protecting teachers from the dysfunctional effects of negative emotional states" (Ross et al., 2004, p. 178).

Limitations

Finally, it should be acknowledged that there are some limitations to this study that affect the strength of the interpretations of these findings. One limitation that is immediately apparent is that the respondents in this sample may not be fully representative of the national population of teachers working with deaf students, as increasing numbers of deaf students are now served in fully mainstreamed settings. The most recent information we have from the Gallaudet Research Institute Annual Surveys show that 57.1% of deaf students are served in regular school settings with hearing students (Gallaudet Research Institute, 2011). However, a high proportion of the teachers in our sample (60.4%) worked exclusively with deaf students, as opposed to the GRI sample, supporting the proposal that these findings are indicative of the experience of teachers who work primarily with deaf students. The sample in this study could also reveal a possible self-selection bias, as this opt-in survey could result in those teachers who were more

self-efficacious being more likely to participate and should be considered as another potential limitation.

Another limitation of this study is that we use ASL proficiency as a measure of the language proficiency of the teacher, whereas ASL is not used in all educational settings serving deaf students. The participants in our sample were more likely to use ASL as the language of instruction, or at least to some extent in the educational setting, with a large number of our respondents (59.1%) reporting the use of ASL in the classroom, with 43.3% using ASL only. And again, the population surveyed in our study differs from findings from the Gallaudet Research Institute that show 27.4% of deaf education settings in the nation reported only using sign language, and when asked about ASL in particular, 14.4% reported that ASL was used regularly in the school (2011). However, the majority of our respondents did report at least some extent of proficiency with ASL, from novice to superior (96.6%), indicating that teachers working in a variety of settings may actually be utilizing ASL at some point or another, perhaps for varying purposes or contexts. The extremely high proportion of teachers reporting some level of proficiency validates the use of ASL proficiency as a variable of interest when looking at communication and language use in the educational setting with deaf students.

It is important to also address a potential limitation that may be particularly salient in deaf education research; that student characteristics were not captured in this work. The growing heterogeneity of deaf students has been addressed through numerous sources and plays a significant role in the challenges faced by the deaf education teacher. Teachers' efficacy beliefs have a relationship with student characteristics such as achievement levels, language backgrounds, language proficiencies, and co-occurring disabilities (e.g., Tasan, 2001; Tschannen-Moran & Hoy, 2001). However, the literature is not clear on how precisely those student characteristics interact with teacher beliefs about their efficacy. Future research could consider examining the relationship of student characteristics and teacher attitudes and beliefs in deaf education settings.

An additional limitation worthy of consideration is related to the extensive variations of deaf education

settings and placements, of which we were not able to entirely capture in the study design. Emergent findings show differences in teacher attitudes and student learning outcomes in mainstream versus separate settings for deaf college students (Marschark et al., 2010; Marschark, Sapere, Convertino, & Pelz, 2008) but are inconclusive in what specific factors mediate the differences in teacher attitudes and student outcomes in those settings. When determining what data to collect for this study, the choice was made to move beyond a distinction between separate and mainstream settings which may not always be clear, in order to make an attempt to capture factors that allow for a comparison across varying settings. We chose to examine the number of deaf students enrolled in the setting, as more indicative of the idea of a "critical mass" of deaf students that has been posited as a potential factor in successful deaf education settings. Mainstream settings with 100 deaf students enrolled in a program may differ extensively from mainstream settings with ten deaf students enrolled, and separate settings with 500 deaf students enrolled may also differ extensively from separate programs with 50 deaf students enrolled. However, since the number of deaf students enrolled did not have a significant relationship with teachers' sense of efficacy, it is suggested that future studies attempt to take a closer look at the contextual influences of the school setting.

Conclusions

Research on teachers' efficacy beliefs has been conducted within an extensive range of teaching settings and populations from English language learners in Venezuela, low-achieving students in Singapore, urban schools in the United States, and English language learners with disabilities in the United States. This is the first study that uses teachers' sense of efficacy as a conceptual framework for examining teacher attitudes and beliefs in deaf education. Teacher training and development can be strengthened with better understanding of what impacts teachers' sense of efficacy in deaf education settings. Collective efficacy is also another dimension that has been unexplored in deaf education settings. The results showing collective efficacy beliefs of the school setting to play a significant

role in teacher beliefs support the importance of administrator training and professional development across the board as opposed to a microlevel focus on the teacher. These findings on teacher efficacy beliefs within deaf education allow for an examination of potential impacting factors of teacher effectiveness and integration with the broader research base that already exists on teachers' self-efficacy.

Conflict of Interest

No conflicts of interest were reported.

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