What do teachers believe? Developing a framework for examining beliefs about teachers’ knowledge and ability

Helenrose Fives a,*, Michelle M. Buehl b

a Department of Educational Foundations, College of Education & Human Services, Montclair State University, 1 Normal Avenue, Montclair, NJ 07042, USA
b George Mason University, 4400 University Drive MSN 4B3, Fairfax, VA 22030, USA

Available online 4 March 2008

Abstract

Influenced by work on teacher beliefs, personal epistemology, teachers’ knowledge, implicit theories, and motivation, we conducted a two-part investigation exploring preservice and practicing teachers’ beliefs about teaching knowledge and teaching ability. Study I qualitatively examined 53 preservice and 57 practicing teachers’ beliefs about teaching, in order to: (1) ensure that the voices of teachers were made prevalent in the development of a framework aimed at understanding their beliefs and (2) facilitate the development of a quantitative measure to assess these beliefs. Results indicated that participants valued several aspects of teaching knowledge and held complex beliefs related to the implicit theories of teaching ability. Study I concludes with a framework for developing an instrument to assess teachers’ beliefs. Study II describes two instruments developed to assess the beliefs identified in Study I. Using responses from 351 preservice teachers, exploratory factor analysis procedures identified factors reflective of emergent themes from Study I.

Keywords: Pedagogical beliefs; Ability beliefs; Pedagogical knowledge; Teachers’ beliefs; Teacher knowledge; Implicit beliefs

* A previous version of this paper entitled “What teachers believe: Exploring beliefs about pedagogical knowledge” was presented at the 2004 Annual Meeting of the American Psychological Association, Honolulu, HI.

* Corresponding author.

E-mail address: fivesh@mail.montclair.edu (H. Fives).
1. Introduction

Beliefs are at play in any learning experience. In teacher preparation, there is a spectrum of deeply held, often unexamined, beliefs that influence how future and practicing teachers approach the task of learning to teach and the knowledge they construct from the experience. As noted by many researchers (e.g., Elbaz, 1983; Grossman, 1990; Woolfolk-Hoy, Davis, & Pape, 2006), effective teachers possess more than vast amounts of content knowledge. They also understand the processes, contexts, and theories that influence teaching practice. This teaching knowledge is often interrelated and, possibly, more implicit than explicit, yet it remains an important aspect of effective teaching and successful learning (Calderhead, 1996).

In learning contexts, preservice and practicing teachers may be guided by their beliefs about teaching knowledge and ability. Such beliefs may lead them to question the value of information presented; make epistemic assumptions about the nature of teaching knowledge; question the validity of knowledge content; and support their views on teaching and the need for teacher education. Understanding these beliefs in the context of learning to teach and their relation to other important outcomes (e.g., classroom practices, student achievement) can inform the development of learning experiences tailored to the needs of future and practicing teachers.

Teachers’ knowledge and beliefs have been the focus of previous investigations (e.g., Kagan, 1992; Pajares, 1992; Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). However, there is a paucity of research examining teachers’ beliefs about the knowledge needed for teaching. We refer to this construct interchangeably as teaching knowledge or teachers’ knowledge and define it as all knowledge relevant to the practice of teaching. Further, there have been repeated calls for more qualitative work related to teachers’ beliefs (e.g., Brookhart & Freeman, 1992; Coladarci, 1992; Munby, 1984). Therefore, in this investigation, we employed qualitative and quantitative research methods to draw across the existing literature and examine preservice and practicing teachers’ beliefs about teaching knowledge and teaching ability.

2. Theoretical influences

Our examination of preservice and practicing teachers’ beliefs about teaching knowledge and teaching ability is influenced by several areas of research that we view as interrelated yet distinct. In particular, we view beliefs about teaching knowledge and teaching ability as components of teachers’ larger belief systems. These subsets of beliefs can be understood in light of research related to personal epistemology and implicit theories of ability and are also informed by current perspectives from the literature on teacher knowledge and motivation.

2.1. Teacher beliefs

The field of teachers’ beliefs we refer to is inclusive of any and all beliefs preservice and practicing teachers have about topics and/or constructs related to teaching, learning, and education (Pajares, 1992). We use the term belief to refer to an “individual’s judgment of the truth or falsity of a proposition” (Pajares, 1992, p. 316). The importance of teachers’ beliefs is highlighted in theoretical discussions, literature reviews, and empirical research. In his review, Pajares (1992) discussed the importance of teachers’ beliefs and highlighted...
the work of several scholars (e.g., Bandura, 1986; Clark, 1988; Cole, 1989; Nisbett & Ross, 1980; Pintrich, 1990; Rokeach, 1968) who emphasized and gave evidence for the examination of beliefs as the “best indicators of the decisions individuals make throughout their lives” (Pajares, 1992, p. 307).

Numerous investigations have explored a wide spectrum of teachers’ beliefs (e.g., motivation: Stipek, Givvin, Salmon, & MacGyvers, 2001; constructivism: Holt-Reynolds, 2000; instructional practices: Borko, Davinroy, Bliem, & Cumbo, 2000; diversity: McAllister & Irvine, 2002; bilingual education: Johnson, 2000; special education: Jordan & Stanovich, 2003; and urban education: Roderick, 1994). These findings suggest that teachers’ beliefs may influence their practice (e.g., Borko et al., 2000). Despite the centrality and importance of teachers’ beliefs, relatively few studies have investigated teachers’ beliefs about teaching knowledge (i.e., their epistemic beliefs about teaching knowledge) or their implicit beliefs about the ability to teach.

2.2. Personal epistemology

Personal epistemology is a term used to refer to individuals’ beliefs about the nature of knowledge and knowing, specifically how knowledge is defined, constructed, justified, and stored (Hofer, 2002). The psychological study of learners’ epistemic beliefs has received considerable attention in the literature and the importance of these beliefs is highlighted by relations to learning outcomes and processes (e.g., conceptual change, self-regulation, and academic performance; Hofer, 2000; Muis, 2007; Qian & Alvermann, 1995; Schommer, 1990). We hold that an analysis of teachers’ epistemic beliefs about teaching knowledge may provide insight into understanding teacher cognition and improving teachers’ ongoing development and preparation.

Others have also discussed the potential role of teachers’ beliefs about knowledge (e.g., Hofer & Pintrich, 1997; Patrick & Pintrich, 2001; Woolfolk-Hoy & Murphy, 2001) and have examined these beliefs in empirical investigations (e.g., Brownlee, Purdie, & Boulton-Lewis, 2001; Gill, Ashton, & Algina, 2004; Ravindran, Greene, & Debacker, 2005; Schraw & Olafson, 2006; Yadav & Koehler, 2007). However, such investigations have examined knowledge as a general construct (e.g., Ravindran et al., 2005) or in relation to a particular academic domain (e.g., Enochs, Scharmann, & Riggs, 1995; Gill et al., 2004). Such investigations reflect the study of epistemic beliefs from both domain-general and domain-specific perspectives.

The present study is rooted in the proposition of domain specificity (Buehl & Alexander, 2001, 2006; Hofer, 2000). A domain can be defined as a recognized and institutionalized field or subject (Alexander, 1997) therefore we contend that knowledge of teaching can be conceptualized as a domain. Preservice and practicing teachers may hold beliefs about knowledge in this domain (i.e., teaching) that differ from their beliefs about knowledge in other domains (e.g., mathematics). Understanding teachers’ epistemic beliefs about teaching knowledge may lend new insights into conceptual change, self-regulation, and professional practice in teachers.

2.3. Teachers’ knowledge

If beliefs about knowledge influence preservice and practicing teachers’ approaches to teaching and learning, then it is important to understand the content of those beliefs. That
is, what is teaching knowledge? We tailor Alexander, Schallert, and Hare’s (1991) definition of knowledge to the field of teaching. Thus, teachers’ or teaching knowledge refers to an individual’s “personal stock of information, skills, experiences, beliefs, and memories” related to the practice and profession of teaching (p. 317). In essence, anything the individual holds that helps him or her fulfill the role of teacher. The distinction between knowledge and belief has been discussed and Pajares (1992) concluded that it was “difficult to pinpoint where knowledge ended and beliefs began” (p. 309). Researchers have posited varied perspectives as to which of these is subordinate. Nisbett and Ross (1980) argued that beliefs are part of knowledge, whereas Rokeach (1968) argued the reverse. We take the former view. We expect that teaching knowledge encompasses all that will assist one in engaging in the practice of teaching.

In the teacher education literature, scholars have put forth taxonomies or frameworks of the teacher knowledge base (e.g., Carter, 1990; Elbaz, 1983; Grossman, 1990; Leinhardt & Smith, 1985; Shulman, 1987) in attempts to describe teachers’ knowledge. Elbaz (1983) identified five aspects of teachers’ practical knowledge [i.e., knowledge of (1) self, (2) the milieu of teaching, (3) subject matter, (4) curriculum development, and (5) instruction] based on an intensive case study of a high school English teacher.

Shulman (1987) drew from the existing research literature to identify seven areas of knowledge that compose teachers’ knowledge base [i.e., (1) content knowledge, (2) general pedagogical knowledge, (3) curriculum knowledge, (4) pedagogical content knowledge, (5) knowledge of learners and their characteristics, (6) knowledge of educational contexts, and (7) knowledge of educational ends, purposes, values and their philosophical and historical roots]. Other categorization schemes have been proposed and researchers have explored what teachers know and how they use their knowledge in real and hypothetical situations (e.g., Holt-Reynolds, 2000; Jordan & Stanovich, 2003; Munby, Russell, & Martin, 2001; Tsai, 2002).

Lacking from the existing research is an extensive taxonomy of the constructs identified under these various frameworks and clarification in the definition of terms. Such an endeavor is beyond the scope of this introduction but the questions of What is teaching knowledge? and What do teachers need to know? continue to plague teacher education, teacher assessment, and teacher practice. Moreover, regardless of what researchers may come to agree upon, preservice and practicing teachers’ beliefs about what is teaching knowledge may ultimately be more important if such beliefs guide them to value or disregard information presented throughout the course of their teacher education and professional development experiences.

2.4. Implicit theories

Implicit theories refer to “poorly articulated” naïve beliefs about the self and social world (Dweck, Chiu, & Hong, 1995, p. 267). Learners’ implicit theories of human attributes are believed to guide their interpretations of the self and others and influence their goals (i.e., performance vs. learning goals) and achievement-related behaviors (Dweck & Leggett, 1988). In particular Dweck and colleagues posit that individuals assume that human attributes are either fixed or malleable and as such adopt either entity theories (i.e., view attributes as unchanging, fixed, and uncontrollable) or incremental theories (i.e., view attributes as dynamic and malleable; e.g., Dweck et al., 1995; Dweck & Leggett, 1988). Most of this research focused on learners’ implicit theories of intelligence and sug-
gests that learners holding entity theories of intelligence are more likely to attribute poor performance or failure to their own intellect whereas learners holding incremental theories tend to explain poor performance by describing task specifics or low effort (e.g., Dweck et al., 1995; Henderson & Dweck, 1990; Hong & Dweck, 1992).

Dweck and colleagues have extended their work on implicit theories of intelligence to examine implicit theories of morality (e.g., Dweck, 2002; Dweck et al., 1995; Dweck, Hong, & Chiu, 1993; Dweck & Leggett, 1988). This extension suggests that these dichotomous implicit theories may be applicable to other areas of personal attributes or ability such as teaching. The process of teaching can be conceptualized as an integration of personal attributes (e.g., care, humor, patience) and professional preparation. The perception that some people are born teachers has been articulated in case study research (Fives, 2005) suggesting that entity theories may exist regarding teaching ability. If entity theories about teaching ability are pervasive among preservice and practicing teachers, these beliefs may explain how individuals respond to professional preparation and failures in classroom settings. Thus, research on implicit theories leads us to ask: What implicit beliefs do preservice and practicing teachers have about teaching ability?

2.5. Motivation

Individuals’ motivation or desire to act or behave in a particular manner (Weiner, 1992) is influenced by beliefs about efficacy (Bandura, 1997) and task value (Wigfield & Eccles, 1992). Teachers’ sense of efficacy, their belief in their ability to perform particular teaching tasks in particular contexts (Tschannen-Moran et al., 1998), has been related to various teacher and student behaviors and outcomes (e.g., student achievement: Muijs & Reynolds, 2002; teacher stress: Greenwood, Olejnik, & Parkay, 1990; burnout: Fives, Hamman, & Olivarez, 2007). However, these beliefs focus on what individuals feel capable of doing and do not address the value of proposed tasks or learning behaviors.

Task value refers to the perceived incentive to engage in a given task (Bong, 2004). In previous research, some have assessed task value as a single construct (e.g., Bong, 2004), whereas others have examined different aspects of task value. For instance, Eccles, Wigfield, and colleagues (e.g., Battle & Wigfield, 2003; Eccles & Wigfield, 1995; Meece, Wigfield, & Eccles, 1990) proposed and identified four dimensions of task value related to (1) intrinsic value (i.e., the enjoyment experienced from task engagement), (2) attainment or importance value (i.e., the personal importance placed on doing well at the task), (3) utility value (i.e., usefulness of the task in achieving future goals), and (4) cost value (i.e., negative aspects of engaging in the task). Although these task value beliefs are highly correlated, they are distinct (e.g., Eccles & Wigfield, 1995) and relate to individuals’ choices (e.g., Meece et al., 1990).

Much of the work on task value was conducted from the perspective of elementary and secondary students but may be particularly relevant for teachers. Research in motivation provides the backdrop for this investigation by highlighting the question of What knowledge do teachers value?

3. Overview of the current investigation

Our goal is to help teachers best serve their students. To facilitate this, teacher education and professional development experiences must be sensitive to preservice and
practicing teachers’ beliefs about teaching knowledge and ability. The current investigation provides insight into these beliefs and represents a foray into understanding and conceptualizing beliefs about knowledge in a professional, as opposed to an academic, domain with recognition of existing theoretical and empirical perspectives (i.e., teacher beliefs, personal epistemology, teacher knowledge, implicit theories, and motivation). We employ qualitative and quantitative methodologies to explore these beliefs and develop measures to assess them in future investigations.

4. Study I: Teachers’ beliefs in teachers’ voices

We embarked on Study I to better understand teaching knowledge and ability as revealed in the voices and perceptions of preservice and practicing teachers. Existing frameworks of teaching knowledge have been based on the reflections of scholars at the university level (e.g., Shulman, 1987) or in-depth case studies of single subjects (e.g., Elbaz, 1983). We felt it was important to understand these constructs from multiple members of the community who are actively using, constructing, and developing that knowledge (i.e., preservice and practicing teachers). Study I was guided by two overarching research questions: (1) How do preservice and practicing teachers articulate their beliefs about teaching knowledge? and (2) How do preservice and practicing teachers characterize the nature of teaching ability?

To address these questions, we employed a qualitative analysis of participants’ responses to a series of open-ended questions. In this study, we conceptualized qualitative research as “any type of research that produces findings not arrived at by statistical procedures or other means of quantification” (Strauss & Corbin, 1998, p. 10) and employed a modified grounded theory approach (Glaser & Strauss, 1967) using the constant comparative method of data analysis (e.g., Bogdan & Biklen, 1998; Strauss & Corbin, 1998). In grounded theory research, data are gathered from multiple participants for the purpose of developing theory derived from the data rather than for the purpose of proving a theory (Strauss & Corbin, 1998). Our work is a modification of this approach because we did not approach our data uninfluenced by existing theory in the areas of teacher beliefs, knowledge, epistemology, implicit beliefs, and motivation. However, akin to grounded theory, we did not begin this study with a working theory of how the beliefs of interest exist and are espoused by our participants. We used analytic induction to derive a framework for these beliefs based on our analysis of the data gathered and influenced by existing theory. The goal of this work was not to provide a thick rich description of our participants. Rather, we sought to develop a framework that is inclusive of the multiple perspectives voiced by our participants (Bogdan & Biklen, 1998). Further, we purposefully sampled preservice and practicing teachers from two regions of the country as a means to elicit maximum diversity of unique beliefs about teachers’ knowledge and ability and to gain an understanding of the breadth of beliefs that are held by members of these groups.

4.1. Method

4.1.1. Participants

Preservice (53) and practicing (57) teachers participated in Study I. Preservice teachers were recruited from education courses at two large, state universities in the United States,
one in the southeast and one in the mid-south. Practicing teachers were sought through master’s level courses, as well as through professional contacts within specific schools in these two regions.

The majority of the preservice teachers were females (70%). These participants described themselves as European American (70%), African American (24%), Asian American (2%), and Hispanic (2%). Forty-three percent of the preservice teachers were university juniors and seniors, 6% had a bachelor’s degree, 40% had a bachelor’s degree with some additional coursework, and 11% had a masters degree. These participants expressed an interest in teaching at the elementary (34%), middle school (6%), and high school (28%) levels. Thirty-two percent of preservice participants did not report the level they wanted to teach.

The practicing teachers were predominately female (79%) and reported their ethnicity as European American (80%), African American (14%), Asian American (2%), Mexican American (4%), and Mixed or Other (2%). These practicing teachers had some education beyond their bachelor’s degree (44%), had completed course work at or beyond the master’s level (35%), or held undergraduate degrees with no additional education (7%). These participants held positions at the elementary (35%), middle school (28%), and high school (16%) levels. Approximately 32% of the participants did not report the grade level they were currently teaching.

4.1.2. Open-ended teaching belief questionnaire (OTBQ)

A 12-item, predominantly open-ended questionnaire was developed to assess beliefs about teaching knowledge and ability (see Appendix). Participants responded in writing and all responses were transcribed into a spreadsheet for data analysis. For the current analysis, we examined beliefs about the content of teachers’ knowledge (i.e., Item 4: “What knowledge is necessary to be an effective teacher?” and Item 8: “What knowledge do teachers hold that is unique to the profession?”) and beliefs about the nature of the ability to teach (i.e., Item 2: “Is teaching a talent people are born with? Please explain.” and Item 9: “Can someone learn how to be an effective teacher?”).

4.1.3. Procedures

Course instructors of the target sample were asked for an opportunity to solicit research participants during class time. Preservice and practicing teachers enrolled in university courses wrote responses to the OTBQ questions in a single sitting at the end of a class session or took a copy of the questionnaire and returned it the next class to a graduate assistant. Practicing teachers not enrolled in university courses were invited to participate in this study at their schools. Colleagues working with professional development schools (PDS) placed the questionnaires with an invitation to participate in teachers’ school mail boxes. Questionnaires were completed and returned to the PDS coordinator within a week. Based on in-class observations and participants’ comments, individuals took 15 to 60 min to complete the OTBQ.

4.1.4. Researchers’ paradigm

As educational psychologists schooled in specific literature bases and familiar with each other’s research, we approached the current investigation with a pre-existing understanding of the nature of beliefs. We contend that beliefs about knowledge (i.e., epistemic beliefs) are multidimensional and domain specific.
As we coded the data, these pre-existing beliefs were at play. We endeavored to keep these beliefs in abeyance (not ignorance) in our initial and secondary analyses of the data by engaging in self-questioning, peer questioning of each others’ coding and theme identification, and broader discussions of these issues. By coding the data at the concept level we refrained from abstracting to larger themes until later in the analysis process, thereby making the data as transparent as possible so that themes would emerge organically.

4.1.5. Data analysis

Data from the preservice and practicing teachers were analyzed collectively using the constant comparative method (Bogdan & Biklen, 1998; Glaser, 1978) to develop a framework representative of the maximum number of themes that emerged. We engaged in a six-stage coding and categorization process that allowed us to interact with the data and examine our evolving understanding of emergent themes. First, we transcribed the data into a spreadsheet and made broad field notes as to possible codes or coding strategies. Second, we skimmed the data to identify the items that best addressed the current research purposes and questions.

Third, we developed exhaustive initial, or primary, codes using the constant comparison method. That is, using descriptive code generation we assigned each unique idea or concept a code. These codes were then applied to the remaining data with new codes generated as needed.

To ensure accurate code generation and coding of responses, we used an alternating and recursive coding schedule. Data were organized into three lots with equal numbers of preservice and practicing teachers in each. One researcher coded and developed codes for one lot of data, then passed the coding scheme to the other researcher. The second researcher applied the coding scheme to the next lot of data, adding codes as needed, and then applied the updated code scheme to the previous data lots. This scheme was then passed to the first researcher to repeat the process on the next data lot. Codes assigned by the researchers to the same data lots were compared and consolidated such that the most fine-grained codes were maintained. Through this process, each item response was examined a minimum of three times, with the more finely tuned coding scheme applied each time. This process resulted in 128 primary codes for items 4 and 8 and 179 primary codes for items 2 and 9.

The fourth stage of data analysis involved generating emergent themes from the codes developed in stage three. Here we independently engaged in a physical sort of the codes for each item set. Using sort cards for each primary code, we mixed them together, organized like codes into piles, and separately generated our own categories and subcategories. At this time, primary codes were allowed to be cross-referenced in multiple categories or subcategories, in order to best represent the data. Following our individual code sorting, we shared and discussed our categorization schemes. Any categories identified by both researchers were retained, with minor modifications and agreement on category titles and code content when necessary. Categories or subcategories unique to either scheme were discussed and we collaboratively determined which best represented the data and addressed the research questions. Thus, during this fourth stage, our initial or primary codes were collapsed into larger more meaningful secondary codes. We consider these secondary codes to be more reflective of the overall sense of participants’ responses. Secondary codes were then grouped into representative emergent themes.

The fifth stage of analysis involved applying the emergent themes and secondary codes to a subset of the data. Specifically, a graduate student, blind to the development of the
coding scheme, was trained in how to use the coding scheme and independently coded 20% of the data. Thus, we were able to assess the applicability of the emergent coding scheme as well as the reliability of our coding. For this investigation, an interrater agreement of .80 was considered acceptable. After initial training, points of disagreement between the graduate student and second author were examined. For items 4 and 8, minor modifications were made to the coding scheme. After making such changes an interrater agreement of .83 was achieved for items 4 and 8.

There was a considerable lack of interrater agreement for the coding of items 2 and 9 related to individuals’ beliefs about the ability to teach. We determined that coding this item set at the concept level was problematic, because coding each phrase or idea separately was not reflective of the overall content of the participants’ statements. We decided to recode responses for items 2 and 9 such that participants received a single code for responses to each item. The codes used here were developed during our initial concept-level analysis of the data. After making modifications to the coding scheme, the authors trained on the new coding system with approximately 40% of the data and established an interrater agreement of .91 for 20% of the data gathered from items 2 and 9. The remaining data were then independently coded by the authors.

In the final (6th) stage of our analysis, we re-examined the identified categories in light of the research questions and our combined knowledge of the existing literature. During this stage, we examined the wealth of organized data relative to our research questions, evaluated our analyses, and described our perceptions of the beliefs presented by the study participants.

4.2. Results and discussion

Our results are organized by our research questions. Findings regarding teaching knowledge are discussed first, next we describe participants’ beliefs about teaching ability, and then we address unexpected findings regarding the need for trait like skills and qualities. We conclude this section by offering our developing framework for conceptualizing these beliefs.

4.2.1. Teachers’ knowledge: Knowledge necessary and unique to teaching

In light of the extant literature on teachers’ knowledge, we wanted to learn what knowledge teachers identified and valued as necessary for teaching. Thus, we asked respondents to report the knowledge they viewed as necessary for or unique to teaching reasoning that individuals would report the knowledge they valued. Of course, individuals may have felt compelled to list knowledge they did not value (e.g., a preservice teacher listing development while enrolled in a child development course) but our intention was to identify the aspects of knowledge that individuals may value. The extent to which preservice and practicing teachers actually value the different aspects of teaching knowledge can and should be explored in future investigations. (Note: We use aspects of knowledge to refer to the different bodies of knowledge individuals may refer to in their responses.)

Our analysis of the data suggested that participants’ conceptualization of the knowledge necessary for teaching could be organized into five themes: 1. pedagogical knowledge; 2. knowledge of children; 3. content knowledge; 4. management and organizational knowledge; and 5. knowledge of self and other. These themes are presented in Table 1 along with secondary codes, illustrative examples, and the frequencies for the codes. To determine the frequency, we summed the number of statements made in response to items 4 and 8 with a particular code. Percentages were calculated based on the total number of statements for
<table>
<thead>
<tr>
<th>Emergent theme</th>
<th>Frequency items 4 and 8 f (%)</th>
<th>Secondary codes</th>
<th>Frequency items 4 and 8 f (%)</th>
<th>Sample response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedagogical knowledge</td>
<td>133 (20.9%)</td>
<td>Methods and practices</td>
<td>73 (11.4%)</td>
<td>How to “read” students and knowing (or guessing) about which techniques will work best with which students (id 229, preservice)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assessment</td>
<td>8 (1.3%)</td>
<td>How to create tests, How to assess students (id 115, preservice)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Motivation</td>
<td>20 (3.1%)</td>
<td>Teachers find—seek out—keys to learning—<em>they discover what motivates and use that to their advantage</em> (id 423, practicing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reach students/</td>
<td>32 (5.0%)</td>
<td>Teachers need to understand all types of learning and <em>be able to successfully reach all kids</em>. Knowledge of material is also most important. Caring for the students is also very big in being effective because you have to care and respect kids in order to reach them (id 215, preservice)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>maximize</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge of children</td>
<td>128 (20.1%)</td>
<td>Learners</td>
<td>84 (13.2%)</td>
<td>Knowledge about how students think and learn; about classroom management; about effective and ineffective strategies (id 147, practicing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(general)</td>
<td></td>
<td>Activating students’ prior knowledge: Knowing your students’ interests, abilities, etc. Knowing how to care for your students (id 428, practicing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Students (own)</td>
<td>44 (6.9%)</td>
<td></td>
</tr>
<tr>
<td>Content knowledge</td>
<td>89 (14.0%)</td>
<td>Content</td>
<td>78 (12.3%)</td>
<td>For effective teaching the most important knowledge is of the content area, but as well it is important to have knowledge of educational issues and of those you are teaching (id 253, preservice)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pedagogical</td>
<td>6 (.9%)</td>
<td><em>content specific pedagogy</em>; <em>effective classroom practices</em>; <em>teachers know their subjects they teach and how to teach the material to students, they know how to make knowledge accessible to students</em>; <em>teacher preparation</em>; <em>conducting hands-on learning activities</em>; <em>knowledge about managing and mentoring student learning</em> (id 405, preservice)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>content</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Curriculum</td>
<td>5 (.8%)</td>
<td><em>Curriculum is very important</em>. State TEKS—very important and how to capture the audience’s attention, and of course content_ (id 411, practicing)</td>
</tr>
</tbody>
</table>

(continued on next page)
Table 1 (continued)

<table>
<thead>
<tr>
<th>Emergent theme</th>
<th>Frequency items 4 and 8 f (%)</th>
<th>Secondary codes</th>
<th>Frequency items 4 and 8 f (%)</th>
<th>Sample response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management and organizational knowledge</td>
<td>43 (6.8%)</td>
<td>Control</td>
<td>34 (5.4%)</td>
<td>You need to have the knowledge of how to have and enforce a classroom management system and what you should do if school policy is broken. Also, an effective teacher needs to know how different children learn so that each method of teaching can be produced in her classroom. She also needs to know the warning signs of common learning disorders (id 104, preservice) Teachers must be able to learn how to multitask and organize. They must be able to adapt and be creative. They must be able to understand and be comfortable with a variety of teaching and learning styles (id 165, practicing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Time/ administrative</td>
<td>9 (1.4%)</td>
<td></td>
</tr>
<tr>
<td>Self/other knowledge</td>
<td>24 (3.8%)</td>
<td>Self</td>
<td>6 (.9%)</td>
<td>One must first understand their personal strengths and weaknesses. Then, they must understand how and when people learn, and when they are able to acquire different levels of knowledge. They must also have the leadership ability to control their classroom/learning environment (id 407, practicing) Different strategies for reaching all types of students; A strong base of the content area one is teaching; People skills; Common sense; How to be creative; Humor (id 426, practicing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>18 (2.83%)</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: *Total number of coded statements in response to items 4 and 8 = 636.

Note 2: Portions of responses italicized and bolded indicate the idea/concept unit coded in the theme and secondary codes indicated.
each code by the total number of statements made in response to items 4 and 8 (i.e., 636). The sample responses in Table 1 provide the participants’ entire responses in order to provide the context in which the statements were made.

4.2.1.1. Pedagogical knowledge. Participants made many references to knowledge of how to teach. That is, comments included domain- or content-free references to methods and practices, assessment, motivation, and the need to reach students/maximize learning. We identified these ideas as pedagogical knowledge akin to Elbaz’s (1983) notion of “instruction” and Shulman’s (1987) term general pedagogical knowledge. We conceptualized pedagogical knowledge as knowledge about (a) facilitating student meaning making (e.g., instructional methods), (b) assessing learning, (c) motivating students, and (d) maximizing learning for diverse classrooms. In contrast to previous descriptions of general pedagogical knowledge (e.g., Borko & Putnam, 1996; Shulman, 1987; Zeidler, 2002) we have not included classroom management and organization within this theme. This decision is reflective of our data. Classroom management and organization emerged as a clear and distinct theme suggesting that our participants saw this as a unique category or aspect of teaching knowledge.

Prior discussions of pedagogical knowledge have been vague about this construct. Here, we offer specific examples from our participants to enhance and solidify our conceptualization of pedagogical knowledge. For example, participants remarked on the importance of knowing how to convey content to learners:

The knowledge that teachers hold that is unique to the teaching profession is their pedagogical knowledge of how to teach students, knowledge on how to design effective and coherent goals/objectives, the impact on student learning by effective planning, engaging instructions etc. (id 405, preservice).

Teachers, or the best teachers, anyway, know a hundred ways to explore a single concept. They are learners themselves, and they never have the luxury of expecting that their knowledge is all they need to know. Teachers are fully aware of all we don’t know (id 235, practicing).

Numerous references emphasized the need for teachers to have specific knowledge of how to teach (e.g., “Must have... an idea of how to present material in an understanding way” id 107, preservice; “Knowledge of... effective teaching strategies...” id 122, practicing). We coded these types of responses as methods and practices. However, we noted that many of these responses were vague. For example, individuals mentioned the need for strategies and techniques but they did not offer specific strategies or techniques. The vagueness of the responses may be due to the assessment tool and how the items were asked. Even so, respondents were much more specific in indicating other knowledge needed for teaching (e.g., knowledge of children).

Although few participants identified knowledge about assessment, this area of pedagogy was recognized by some as crucial. For instance, one preservice teacher stated:

I feel that the knowledge of making a test is one way that makes a teacher unique. Tests are hard to make and can be hard to grade. If you make them reliable and valid it makes you a unique teacher because so many teachers don’t (id 106, preservice).
Similarly, some participants remarked on the importance of motivation to the teaching and learning process. However most comments were vague, as reflected in one preservice teacher’s comment: “...How to motivate students, what works and what doesn’t...” (id 110).

Based on the literature and current trends in education, we were surprised by scarcity of responses recognizing knowledge of motivation and assessment as essential. For instance, student engagement is one of the three central components in Tschannen-Moran and Woolfolk-Hoy’s (2001) measure of teacher efficacy however our sample of preservice and practicing teachers made few references to the need to know about motivation and referred to additional forms of knowledge, skills, and abilities not represented on the Tschannen-Moran and Woolfolk-Hoy teacher efficacy measure. This raises questions about how representative their scale is of the knowledge and skills teachers need. Additionally, given the current emphasis placed on testing in the U.S. we anticipated that more individuals would have referred to knowledge of assessment. The lack of responses may indicate how little teachers value testing. As evidence of this, one respondent referred to the need for teachers to know the limitations of standardized tests.

Within the theme pedagogical knowledge we also included comments coded as “reaching students and maximizing learning.” We viewed this aspect of knowledge as distinct from knowledge of methods and practices or motivation because these references reflected a combined knowledge of motivation and instruction relative to reaching the needs of a variety of learners and helping students to learn. For example, participants stated:

The ability to identify student needs and abilities and to adjust their methodologies to maximize student learning and test performance (id 201, preservice).

Developing instruction that meets the needs of a diverse population and managing the population so each individual learns (id 421, practicing).

4.2.1.2. Knowledge of children. Many participants reported that teachers need to know about children. Our analysis of the data indicated some distinction in conceptualizations of knowledge of children. Namely, responses could be divided into two categories: (1) knowledge of learners and learning in general and (2) knowledge of the specific students with whom teachers work. This distinction was highlighted in one teacher’s response:

First and foremost, teachers must know how the learning process occurs. Secondly, they must have an intimate knowledge of their learners—their strengths, weaknesses, and preferences... (id 419, practicing).

Participants remarked on the need to understand and know about children as learners in general. These comments included knowledge of development, learning disorders, cognition/how children think/learn, and learning styles as evidenced in the following examples:

The knowledge that all children are not the same and they all learn differently... (id 155, preservice).

The knowledge of how children learn and how they interact socially with other children. Children’s limits and capabilities to acquire new information (id 171, practicing).
Other statements emphasized the need for teachers to know the specific students in their classes. Participants felt it was important for teachers to know their students’ home life and background (e.g., “Knowledge of students; you need to know the students’ background in order to teach them at the right level” (id 117, preservice), to know the individual needs of their students (e.g., “…[Teachers have an] awareness of learning needs exhibited by students…” (id 201, preservice), and to identify their students’ abilities (e.g., “You need to know your learners—their strengths and weaknesses, their learning styles…” (id 408, practicing).

4.2.1.3. Content knowledge. A third theme referred to the need for knowledge about the specific subject (content) taught, pedagogical content knowledge (i.e., knowledge of content-specific teaching methods and strategies), and knowledge of the curriculum. Previous descriptions and taxonomies of teachers’ knowledge have elaborated on distinctions among these aspects of knowledge and have repeatedly highlighted the distinction between general pedagogical knowledge and pedagogical content knowledge (e.g., Shulman, 1987). Zeidler (2002) described the focus of educational reform as “tripartite structure” anchored by teachers’ “subject matter knowledge, pedagogical knowledge, and pedagogical content knowledge” (p. 27). Despite the theoretical distinctions among these knowledge types, our data suggested that subject or content knowledge and pedagogical content knowledge were highly interwoven. Specifically, references to pedagogical content knowledge were made in conjunction with knowledge of content or curricula. Thus, we chose to include pedagogical content knowledge with content and curricula knowledge in one category that describes teachers’ knowledge of content, how to teach it, and their curricular perspective on the subject matter.

Participants reported that content knowledge was essential by offering comments such as

Well, you need to know what you'll be teaching, math, science, reading, spelling, English, history/social studies. Not only do you need to know the info[rmination] at the grade level you are teaching, but you should know more (college level)… (id 111, preservice).

Participants also described a need to know both the content and the best way to deliver the content within a given domain (i.e., pedagogical content knowledge). One teacher stated “Teachers need to be familiar with… the content area, and how to teach the content” (id 429). We found the scarcity of reports about the importance of pedagogical content knowledge surprising given the emphasis that pedagogical content knowledge has received since Shulman (1986) offered his initial framework for the teacher knowledge base.

Finally, some participants remarked on the need for teachers to know the curriculum of the school in conjunction with teaching methods [e.g., “Knowledge of the curriculum and ways to teach it to students of all ethnic backgrounds” (id 119, preservice)]. In addition, a practicing teacher emphasized the importance of being able to find curriculum that is relevant for the content and methods available “…They need to understand what type of instructional methods could be used to teach certain things and where curriculum can be found that would enhance instruction” (id 421). The curriculum knowledge described here is reflective of another area Shulman (1986) identified as an important aspect of teacher knowledge.

4.2.1.4. Management and organizational knowledge. The need for management and organizational knowledge emerged as a theme as evidenced by the following responses:
Classroom management is the biggest problem, [teachers] need to know different ways to manage a class, so they can choose which one is most proficient for them (id 113, preservice teacher).

Classroom management is something teachers must understand before teaching. Teachers must be ready for a diverse classroom (id 172, practicing teacher).

Statements were made by practicing and preservice teachers about the need for teachers to know how to control or manage a classroom. For example one practicing teacher stated: “Teachers know the mundane details of managing a classroom, not taught” (id 236). Additionally, participants indicated that there is a need for other administrative and time management skills such as the ability to multi-task and organize a classroom. This was described by a preservice teacher as “How to conduct a working classroom 6 periods a day” (id 247). The details of this were echoed by several practicing teachers with statements such as “Time management, be an effective facilitator, . . . be professional, be resourceful . . .” (id 171).

4.2.1.5. Self and other types of knowledge. As a final emergent theme, we have a catch-all category that includes responses describing a need for teachers to know themselves, that is knowledge of self (e.g., “Knowledge of self; know your own weaknesses and don’t hold students accountable for them” id 117, preservice; “An ability to meta-cognate—if I may be so bold, I am an effective teacher because I understand how knowledge came to me” id 412, practicing) as well as knowledge that did not coalesce into a meaningful theme such as knowledge of current events and pop culture (e.g., “…Internet awareness…” id 152, practicing; “Teachers get to be immersed in pop-culture…” id 259, preservice) described here as other.

We combined the self knowledge into the self/other category because these responses were rare in our data and we were uncertain how this knowledge was conceptualized in relation to teaching. Elbaz’s (1983) framework of teacher knowledge included self knowledge suggesting this may be an area in need greater study. We, however, did not have the data available to pursue it in this investigation.

4.2.1.6. Nothing unique. In examining the knowledge cited as the necessary or unique to teaching, we noted similarities between the responses from our participants and other teacher knowledge categorization schemes (e.g., Elbaz, 1983; Shulman, 1986), as well as standardized assessments of teacher knowledge (e.g., Praxis). However, we were surprised that seven participants stated there was nothing unique about the knowledge required for teaching. For instance, when asked “What knowledge is unique to the teaching profession?” participants responded “Not knowledge, but feelings of empathy, caring and love of their profession” (id 417, practicing) and “Probably none” (id 409, practicing).

Seven other respondents, largely undergraduates, indicated that they did not know how to respond to the question. Thus, 12% of our participants did not articulate any knowledge as necessary or unique to teaching. This finding is particularly disheartening and may have implications for why individuals do not value teacher education classes and programs.

4.2.2. Beliefs about the ability to teach

In the OTBQ, we asked preservice and practicing teachers to share their views about the ability to teach (i.e., item 2: “Is teaching a talent people are born with? Please explain.”
and item 9: “Can someone learn how to be an effective teacher? Please explain.”). We viewed these items as addressing beliefs about the nature of the ability to teach.

In our analysis of the data, we found that responses to item 2 primarily pertained to beliefs about innate ability whereas responses to item 9 pertained to beliefs about the ability to learn how to teach. These variations are understandable due to the wording of the items. In Table 2, we present the number and percentage of respondents for each emergent theme and secondary code by item (i.e., item 2 and item 9) as well as sample responses. Because individuals’ complete responses to items 2 and 9 were separately classified into one of the ability belief themes, the percentages and frequencies reported are related to the total number of participants.

Participants’ responses to the open-ended questionnaire reflected a spectrum of beliefs about the ability to teach. That is, instead of the entity-incremental dichotomy seen in the research on implicit beliefs (e.g., Dweck et al., 1995; Dweck & Leggett, 1988) our participants’ beliefs about the ability to teach appear to exist along a continuum. Although this continuum is anchored by beliefs that the ability to teach is innate (entity theory) or learned (incremental theory), there are also more mixed views and some inconsistencies across responses. Beliefs about the ability to teach were reflected in the following themes: innate, requires polish, innate for some—learned for others, learned, and a calling or gift.

4.2.2.1. Innate. A large portion of our sample indicated that teaching is an innate ability. Participants described an innate perspective using terms such as innate or inborn abilities, natural talent or instinct, and a few indicated this perspective by stating that teaching cannot be learned. Responses that reflect this perspective of teaching ability included:

I believe that some people are born with a talent for teaching, and some may not be. Those who are and pursue that career are the teachers out there who excel in the profession. Those who are not probably don’t do as well and may not “stick” with the profession (id 127, practicing).

Yes [teaching is a talent people are born with]. I believe people are born with the talent, as (true) teachers can articulate very well the subject being taught, to their student(s) (id 169, practicing).

I feel teaching is an innate talent. Many people “know” a subject, but to be able to transfer that information in various ways in order for another to learn and internalize that information and access it later requires a true talent (id 415, practicing).

Across these responses the emphasis is on the perspective that to be a teacher, at least a “true” teacher, one must have innate ability. Further, as seen above in the sample responses, participants indicated that individuals who attempt to teach without this innate ability were less likely to “stick with it” (id 127, practicing) or were somehow “not true teachers” (id 169, preservice). Moreover, some participants suggested, as seen in the third quote above, that knowledge of content was not sufficient for teaching.

These findings indicate that the ability to teach is viewed as an innate ability. We know from the attribution literature that students with fixed ability beliefs frequently attribute their success or failure to innate tendencies or traits, such as “being born smart” (e.g., Wei-
Table 2

Frequency of statements indicating beliefs about the ability to teach and sample responses

<table>
<thead>
<tr>
<th>Emergent themes</th>
<th>Frequencies</th>
<th>Secondary codes</th>
<th>Frequencies</th>
<th>Sample response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item 2</td>
<td>Item 9</td>
<td>Item 2</td>
<td>Item 9</td>
</tr>
<tr>
<td></td>
<td>$f$ (%)</td>
<td>$f$ (%)</td>
<td>$f$ (%)</td>
<td>$f$ (%)</td>
</tr>
<tr>
<td>Innate</td>
<td></td>
<td>Inborn/talent</td>
<td>37 (33.6%)</td>
<td>5 (4.5%)</td>
</tr>
<tr>
<td></td>
<td>30 (27.3%)</td>
<td>0</td>
<td>30 (27.3%)</td>
<td>0 (--)</td>
</tr>
<tr>
<td></td>
<td>3 (2.7%)</td>
<td>0</td>
<td>3 (2.7%)</td>
<td>0 (--)</td>
</tr>
<tr>
<td>Ability to teach</td>
<td></td>
<td>CANNOT be learned</td>
<td>4 (3.6%)</td>
<td>5 (4.5%)</td>
</tr>
<tr>
<td>Requires polish</td>
<td>27 (24.5%)</td>
<td>20 (18.2%)</td>
<td>18 (16.4%)</td>
<td>18 (16.4%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Born with other qualities that help teaching</td>
<td>18 (16.4%)</td>
<td>18 (16.4%)</td>
</tr>
<tr>
<td></td>
<td>Part innate and part learned</td>
<td>9 (8.2%)</td>
<td>2 (1.8%)</td>
<td>I believe teaching is partially inborn. Temperament and tendencies that make great teachers have to be inherently there. However, without training and experience those inborn tendencies are useless (partially nature–partially nurture) (id 419, practicing)</td>
</tr>
</tbody>
</table>
I believe that some people have a natural ability to teach. However, with education and practice the rest of us can do perfectly well (id 425, practicing).

No, teaching is acquired through experience. The skills needed are not innately in each of us. However some are just naturally better than others (id 117, preservice).

I don’t think teaching is a talent teachers are born with. It is a privilege to be a teacher. I think most people start teaching because of vicarious learning. I liked the way my son’s teachers are, and watching them teach, inspired me to become a teacher (id 155, preservice).

Yes, like I said in another question—no one is born w/a “teaching gene.” Training is needed (id 114, preservice).

I truly believe teaching is a calling that you either have it or not. You can not try to become a teacher. Those who do quickly leave the profession (id 413, practicing).

Teaching is a gift from God. Some are just born with it. I think that through observational learning and through taking the required education courses in college, you can better improve your skills and therefore become more effective (id 101, preservice).

<table>
<thead>
<tr>
<th>Innate for some, learned for others</th>
<th>For some innate, some are better at learning to teach</th>
<th>Learned/can learn or be taught</th>
<th>Not inborn/not a talent</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 (20.0%) 3 (2.7%)</td>
<td>20 (18.2%) 1 (9.0%)</td>
<td>9 (8.2%)</td>
<td>8 (7.3%) 0 (—)</td>
</tr>
<tr>
<td>18 (16.4%) 81 (73.6%)</td>
<td>1 (0.9%)</td>
<td></td>
<td>3 (2.7%) 1 (—)</td>
</tr>
</tbody>
</table>

Note: Number of respondents = 110.
ner, 1992). The same attribution in teachers about teaching may have the same repercussions as fixed ability beliefs in students, namely, the belief that nothing can be done to improve on these abilities.

This has important implications for the preparation and retention of teachers. If preservice teachers (i.e., education students) believe that the ability to teach is an innate talent, they may be less receptive to the information presented in their education programs. When difficulties are encountered in the classroom, individuals who hold innate views of teaching abilities may experience threats to their sense of teaching efficacy and be more likely to leave the profession. Indeed, some of our respondents explicitly stated that those who do not have the talent to teach “may not ‘stick’ with the profession” (id 127, practicing) or “should not be in the classroom” (id 110, practicing). This view of teaching also has implications for the mentoring of student teachers and new teachers. That is, veteran teachers may be less likely to offer support and assistance to those they perceive as not having it. Similarly, new (and established) teachers with an innate belief about teaching ability may be less likely to seek out or accept help from colleagues with more or different experiences.

4.2.2.2. Requires polish. Some participants felt that while teachers must have some innate qualities or abilities those abilities must be polished for classroom use. Others indicated that certain innate or inborn qualities or tendencies (e.g., passion, understanding, and love of children) were needed to make a person more inclined to develop an ability to teach. This tension between innate abilities and professional training is evidenced in a thoughtful response provided by one of our practicing teachers. The remarks in italics indicate an incremental or “learned” perspective while those underlined indicate a more innate or fixed perspective.

I don’t believe teaching skills are limited to persons who have a natural talent. Good teachers can “think on the spot” and adjust strategies/plans to better meet the needs of the moment. The natural ability to do this is usually due to innate abilities nurtured and developed from birth. However, one can intellectually learn the mechanisms of teaching and accumulate knowledge needed to teach, appearing to be an excellent teacher but that is his/her job. If they teach well but hate their job what are they really teaching? Many aspects of learning are caught not just taught. Those from whom one “catches” a particular attitude, concept or piece of knowledge are usually the teachers born with the intellectual capacity and desire to learn that’s reflected in there contagious attitude.

However, even they must learn effective strategies for teaching. They are not born knowing them (id 422).

These remarks underscore the perspective that teaching requires an innate ability or quality that must be fine-tuned or nurtured into teaching skills. Some responses in this theme also highlight the importance of particular attitudes or perspectives that were seen as innate yet insufficient as the sole source of teaching ability. For instance:

No [teaching is not a talent you are born with]. You do have to have the born ability to be patient and understanding when dealing with children, but your skills are learned in college courses and from student teaching (id 113, preservice).
No [teaching is not a talent you are born with], people are born with a gift for association and charisma that is inviting. You can learn methodologies to teach effectively (id 201, preservice).

This perspective on the ability to teach may be more adaptive to preservice and practicing teachers. Individuals with this belief may be more likely to recognize the value of formal training and be more persistent when difficulties in the classroom are encountered.

4.2.2.3. Innate for some, learned for others. A second hybrid view of the ability to teach emerged in which individuals expressed the belief that the ability to teach was both innate and learned. In contrast to the previous theme, requires polish, which suggested that teaching ability was partially innate and partially learned for a single individual, this theme (i.e., innate for some, learned for others) represents the view that although some individuals have innate talent or ability for teaching, other individuals can learn and develop the ability to teach. Also, included in this theme is the perception that whereas some may be better able to learn how to teach than others, everyone can learn. One preservice teacher stated “Some people have a natural talent but others can be just as effective by hard work and determination” (id 404). This statement recognizes that, although teaching can be learned, the amount of effort needed to do so may vary across individuals. This perspective is echoed by a practicing teacher who contextualized her response within her own school environment.

Yes, [teaching is a talent] to an extent, which is not to say it can’t be learned. There seem to be people, some of whom I work with, who just “have it.” They understand how to convey concepts without prodding or the need for much clarification. Others need to see effective teaching modeled before they can do it themselves (id 412, practicing).

These responses and the examples provided in Table 2 demonstrate a belief that anyone can enter and thrive in the teaching profession, provided they are willing to work hard and seek opportunities to learn. Consequently, this perspective on the ability to teach may be more adaptive to teacher development than the requires polish perspective.

4.2.2.4. Learned. This theme reflects an incremental view of the ability to teach. Preservice and practicing teachers in this study indicated that they believed individuals can learn how to teach. For example, both practicing and preservice teachers indicated that they had learned through formal preparation experiences as evidenced in the following responses:

Yes [one can learn to be an effective teacher], through my professional development I have become a much more effective teacher (id 410, practicing).

Yes [one can learn to be an effective teacher]. I have learned a lot of different techniques and strategies in my education classes that I would never [have] come up with on my own (id 229, preservice).

Other participants agreed with the sentiment that teaching ability can be learned reporting that teaching was not an innate talent but must be acquired or developed through external influences. One practicing teacher argued that teaching ability was related to
contextual influences, stating “No [teaching is not a talent]. How people are raised and their educational experiences determine attitudes and teaching abilities” (id 136). Others stated “No [teaching is not a talent], it is something that you gain through experience” (id 253, preservice) and “No [teaching is not a talent], it can be developed through practice” (id 260, preservice).

We view the belief that individuals can learn to teach as most adaptive as individuals with this view are more likely to be receptive to teacher education. Such individuals may also be more resilient to obstacles or difficulties in the classroom. Instead of viewing a situation as a failure that reflects their inherent ability to teach, individuals who believe teaching is learned may view difficulties as learning opportunities that can lead to further growth and development.

Despite the promise of such views, an examination of individuals’ responses to items 2 and 9 reveal some inconsistencies. In particular, across items the same individuals reported that teaching ability was both innate and that individuals could learn how to be teachers. This further highlights that individuals may hold mixed perceptions about ability and that responses may be influenced by the wording of the item.

4.2.2.5. Calling or gift. Finally, there was one emergent theme that we felt did not fall along the continuum of innate to learned. Specifically, some individuals viewed the ability to teach as “a calling” or “gift.” We felt that this choice of words indicated that, to these individuals, the ability to teach was neither innate nor learned, but that they were called to teach or gifted with the ability by a higher or external power. This perspective was also represented by referring to teaching as a “God-given gift.” We distinguished these responses from the innate theme, because such a calling or gift indicates that a force beyond the individual is responsible for teaching ability. For instance one preservice teacher noted “…I believe that God gave all of us a talent and teaching is one of those talents” (id 106).

Other responses in this theme focus more on the perspective that teaching is a calling or something they are “meant” to do. One preservice teacher remarked:

...Anyone can teach a particular topic, but to teach is a calling to me. I knew that ever since I was a little girl that I was going to be a teacher. I feel it in my bones! There is nothing else that I’d rather be. Some people teach but they are not called to teach, that’s why they don’t stick with it but if you are born a teacher, you’ll retire a teacher (id 109).

The adaptability of this belief is uncertain. Individuals’ with this belief may be akin to those with innate views. That is, these individuals may believe that teaching, as a gift from God, does not need to be learned or even polished. In contrast, others who see teaching as a calling, or vocation, may recognize a need to study and learn how to fulfill this call in a way that would give glory to their God. While such conclusions are beyond the data gathered in this study, these are important issues to consider when working with preservice and practicing teachers who enter the field with rich and diverse cultural, spiritual, and religious belief systems.

4.2.3. Beliefs about skills and qualities

A recurrent, and unanticipated, finding that emerged from our data was a need for teachers to have certain skills and/or qualities. Although our questions asked about
knowledge unique or necessary for teaching and whether teaching is a talent or something that can be learned, across all of the items participants referred to qualities and skills teachers need. Table 3 outlines the emergent themes, secondary codes, and sample responses that describe these findings. We divided these responses into two large categories: skills and qualities. Skills refer to more cognitively based or thinking abilities including communication or people skills and ingenuity. By qualities, we mean more affective or feeling traits including nurturance or care, enthusiasm, and integrity and dedication.

4.2.3.1. Beliefs about the skills needed for teaching. Participants in this study responded that teachers needed, had, or could develop skills related to communication and people, and adaptability and ingenuity.

Participants identified three areas of communication skills required for teaching: oration or presentation skills, people skills, and listening skills. Participants suggested that teachers had to be “good orator[s]” (e.g., id 104, preservice) to be able to explain things well, and to be able to “get their point across” (e.g., id 101, preservice). These, and other responses, highlighted an overall need for teachers to communicate information to a class or learner in such a way that they are readily understood.

The category of communication skills also included responses generated around the idea of people skills. However, participants rarely explained what they meant by this expression (e.g., “...There is an inherent people skills personality that I feel furthers the teaching ability” id 241, preservice). Comments in this theme also described rapport building, relationship building, social skills, and an ability to anticipate students’ needs, or actions. In the following response, a practicing teacher describes this perspective (underlined portion) within her response to the question “Is teaching a talent?”

I think some people are more “natural” teachers. Some people are very comfortable in a school setting and seem to establish a good rapport with students immediately. These people seem to know just what to say or do so that an optimum learning environment is created. I do think others that don’t seem to be “naturals in the classroom” can be taught effective teaching strategies (id 125, practicing).

Thus, we inferred that when participants stated that teachers need or have “people skills” they intended something more than the ability to present or deliver information in an understandable way. Rather, people skills implied a meaningful way of engaging with others. Hence, the data suggested that teachers are expected to understand and be able to relate to students and, through these relationships, facilitate learning.

Our participants also indicated that teachers need to be good listeners. This seems to balance the oration/presentation skills previously discussed. Interestingly, participants offered more statements related to the presentation of information than to listening to others. In the initial exhaustive analysis of the data, we used twice as many descriptors to code data relative to the presentation of information than we did for listening. This may suggest that when considering the teaching activity participants focus more on the information that teachers give rather than the importance and potential influence of the information that they receive from their students. The sage on the stage still seems to overshadow the guide on the side.

A second set of skills reflected a need for adaptability and ingenuity. Here, adaptability and ingenuity conveys the need for teachers to use their own wits and know-how to deal with the challenges they face. Inherent in this theme is the notion that the challenges they
Table 3
Frequency of statements indicating teaching skills and qualities and sample responses

<table>
<thead>
<tr>
<th>Emergent theme</th>
<th>Frequency items 4, 8, 2, 9</th>
<th>Secondary codes</th>
<th>Frequency items 4, 8, 2, 9</th>
<th>Sample response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skills (cognitive/thinking abilities)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication/people</td>
<td>67 (5.2%)</td>
<td>Oration/presentation</td>
<td>21 (1.6%)</td>
<td>Yes. I believe people are born with the talent, as (true teachers can articulate very well the subject being taught, to their student(s) (id 169, practicing)</td>
</tr>
<tr>
<td>People skills</td>
<td>41 (3.2%)</td>
<td>People skills</td>
<td>41 (3.2%)</td>
<td>Yes, some will ultimately be better than others, because they possess better social skills and are more personable, but teaching can be learn [ed]—from practice to trial and error—you can learn other aspects of teaching like discipline, classroom management. And knowing these will help you to become more effective to your students (id 213, preservice)</td>
</tr>
<tr>
<td>Listening</td>
<td>5 (.4%)</td>
<td>Listening</td>
<td>5 (.4%)</td>
<td><strong>Be a listener</strong> and be open to your students’ suggestions. If you listen they will listen (id 208, practicing)</td>
</tr>
<tr>
<td>Adaptability and ingenuity</td>
<td>27 (2.1%)</td>
<td>Flexibility</td>
<td>15 (1.2%)</td>
<td>...Good teachers can ‘think on the spot’ and adjust strategies to better meet the need of the moment. The natural ability to do this is usually due to innate abilities nurtured &amp; developed from birth. (id 422, practicing)</td>
</tr>
<tr>
<td>Creativity</td>
<td>6 (.5%)</td>
<td>Creativity</td>
<td>6 (.5%)</td>
<td>I believe teachers possess certain characteristics that others do not embody. Teachers are creative, caring, organized, responsible, and hard-working (id 429, practicing)</td>
</tr>
<tr>
<td>Stress management</td>
<td>6 (.5%)</td>
<td>Stress management</td>
<td>6 (.5%)</td>
<td>(1) subject matter first; (2) understanding development of child or adolescent; (3) practical knowledge of teaching, such as classroom management; stress management (id 257, preservice)</td>
</tr>
<tr>
<td><strong>Qualities (affective/feeling abilities)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurturance/care</td>
<td>87 (6.8%)</td>
<td>Caring, compassionate, love children</td>
<td>62 (4.8%)</td>
<td>I definitely think you need to have a love for children and a desire to help student succeed in life (id 208, preservice) You have to have patience and love people and it will have to be something you want to do and see yourself doing (id 109, practicing)</td>
</tr>
<tr>
<td>Patience</td>
<td>25 (2.0%)</td>
<td>Patience</td>
<td>25 (2.0%)</td>
<td></td>
</tr>
</tbody>
</table>
Enthusiasm 53 (4.1%) Passion and optimism 10 (.8%) To know that you need to be passionate about your job.
Teaching isn’t just standing in front of a class talking. You’re going to have to be there for your students and help them along the way. You have to let them know you care about them and show them that you love them. You have to be willing to make a difference in one’s life (id 107, preservice)

Love of learning 8 (.6%) Love teaching 9 (.7%) Yes, [learning is innate] a person can know all theories and terms for being a teacher. It takes a special person who has a love of learning, teaching, and people to be a teacher, not everyone has that ability (107, preservice)

Love content 4 (.3%) If a person has the love of a subject and the personality of wanting to give, plus the ability to be very flexible becoming an effective teacher is possible (id 236, practicing)

Want to make a difference 22 (1.7%) Yes (one can learn to teach), but they must first have a desire to want to help others (id 117, preservice)

Integrity and dedication 25 (2.0%) Commitment, dedication 23 (1.8%) Knowledge of how students learn, what are affective teaching strategies, patience, caring and dedication is important (id 122, practicing)

Fair and respectful to students 2 (.2%) Good behavior management skills. One must understand that fair does not mean that everyone is treated the same. Fair means that each child gets what he/she needs. Understanding of how to accommodate the learning disabled children in your classroom. Understanding how to spot weaknesses for referrals. Mentoring in the teaching field (id 141, practicing)

Note 1: Total number of coded statements in response to questions 4, 8, 2, and 9 = 1281.
Note 2: Portions of responses italicized and bolded indicate the idea/concept unit coded in the theme and secondary codes indicated.
face are new and do not have a predetermined resolution to be identified and applied. For this theme, participants’ responses fall in the subcategories of creativity, flexibility, and stress management. Participants articulated a need for flexibility describing the need for teachers to “think on the spot” (id 422, preservice) and multitask.

Also included in this theme were responses coded as “stress management.” Comments such as “[Knowing] how to function in a stressful environment where your ability to size-up people and situations is crucial to the delivery of instruction” (id 406, practicing) evidence the importance for teachers to be able to manage their own stress. We included stress management with this section, because it reflected a need on the part of teachers to be resilient to accommodate to the needs of their professional role and lends credence to the overall notion that teachers must have the wherewithal to deal with daily challenges.

4.2.3.2. Beliefs about the affective qualities needed for teaching. We also noted affective qualities that emerged from the data. That is, participants referred to the need for teachers to have, demonstrate, and/or develop particular feelings in order to be effective. We identified three emergent teacher quality themes: nurturance/care, enthusiasm, and integrity and dedication. However, the first two themes received far more attention by our respondents than did the third.

The nurturance/care theme was apparent throughout responses to all of the items. This theme reflected responses identified by codes such as caring, compassionate, love children, and patience. Participants offered responses to questions about knowledge and ability with comments like “...They [effective teachers] care about the students and the job that they are doing...” (id 213, preservice) and “...I think that a big part of teaching is showing the student that you care.” (id 204, preservice). This theme incorporated statements in which respondents identified a need for teachers to hold affection for their students and to act on that affection in meaningful ways.

The second quality theme, enthusiasm, reflected a belief that teachers must have a great deal of motivation and positive feelings for their job. Participants indicated that teachers must: have “passion” (id 403, preservice), have a “love of learning” (id 107, preservice), “love teaching” (id 241, practicing), and “want to make a difference” (id 212, preservice). Moreover, these responses indicated that teaching is more than a job and requires intrinsic interest.

The third and final emergent theme related to qualities was integrity and dedication. Responses in this theme highlighted that teachers must be committed to teaching, fair, and respectful of their students. For example, one teacher stated “...A teacher should be able to work collaboratively, but at the same time maintain personal integrity” (id 415, practicing).

Beyond the boundaries of the present data lies the question of why so many respondents perceive these affective-oriented qualities to be necessary for effective teaching. Why must teachers “love kids,” “love teaching,” “have passion,” and be “willing to make a difference”? Why did so many respondents use these types of replies when asked what knowledge teachers’ hold that is “unique” to teaching? The emergence of these issues warrants a deeper examination of teachers’ affective feelings toward teaching and the need to emotionalize the profession.

4.3. Hypothesizing a framework

Based on the data presented, we developed an initial framework for organizing beliefs about teaching knowledge and ability. This framework is detailed in Table 4 and includes
four components: (1) beliefs about the importance of teaching knowledge, (2) beliefs about the ability to teach, (3) beliefs about teachers’ need for cognitive skills or abilities, and (4) beliefs about teachers’ need for affective qualities.

Beliefs about the importance of teaching knowledge and beliefs about teaching ability are reflected in the first two belief components. However, our analysis suggests that these two components are comprised of a several more specific beliefs. First, teachers value different aspects of knowledge. Thus, we propose that the belief component of teaching knowledge include beliefs about the importance of knowledge about pedagogy, children, content, and classroom management. To assess these beliefs, we recommend separating out specific knowledge aspects within each of these broad categories of teacher knowledge. For example, the term classroom management means many things to many people. Rather than using this global construct we suggest more specific indicators that tap into this broad knowledge base (e.g., control and discipline, movement management in the classroom, “with-it-ness,” multi-tasking, and administration). We would make similar efforts with the other areas identified.

Second, with respect to the nature of teaching ability, we now recognize a need to offer respondents more options with respect to this belief. Our analysis demonstrated that pre-service and practicing teachers’ beliefs about this issue are not dichotomous. Rather, these beliefs are more complex and individuals possess a range of perspectives including believing teaching to be a talent that requires additional training or polishing, believing that some people have a talent but others must learn, and having mixed or uncertain beliefs about the nature of the ability to teach. Additionally, some participants considered teaching to be a calling. The inclusion of this range of beliefs in our framework may allow us to better understand the nature of this belief construct, and whether persons holding it adopt a more innate/fixed or more learned/ability orientation to the acquisition of teaching knowledge. Study II offers the initial development of a measure using these belief components to develop subscales intended to assess these areas of beliefs.

The final two belief components are the unexpected themes that emerged from our analysis, beliefs regarding cognitive skills and affective qualities. Examining how beliefs about

<table>
<thead>
<tr>
<th>Component</th>
<th>Specific beliefs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Importance of teaching knowledge</td>
<td><em>It is most important</em> that teachers know...</td>
</tr>
<tr>
<td></td>
<td>pedagogy children in general;</td>
</tr>
<tr>
<td></td>
<td>their students in particular</td>
</tr>
<tr>
<td></td>
<td>content and pedagogical content knowledge</td>
</tr>
<tr>
<td></td>
<td>classroom management and organization</td>
</tr>
<tr>
<td>2. Ability to acquire teaching knowledge</td>
<td>Teaching is... innate but requires training.</td>
</tr>
<tr>
<td></td>
<td>innate for some and learned for others</td>
</tr>
<tr>
<td></td>
<td>a calling</td>
</tr>
<tr>
<td>3. Need for cognitive skills</td>
<td>Teachers must have... communication and people skills</td>
</tr>
<tr>
<td></td>
<td>adaptability and ingenuity</td>
</tr>
<tr>
<td>4. Need for affective qualities</td>
<td>Teachers must... care/nurture have enthusiasm be committed</td>
</tr>
</tbody>
</table>
these skills and qualities relate to other important constructs such as teacher efficacy (Bandura, 1997), teacher burnout (Maslach & Jackson, 1981), teacher commitment (Coladarci, 1992), and pupil control beliefs (Woolfolk & Hoy, 1990) may offer insight into the development and education of teachers. However, we did not assess these beliefs in Study II.

5. Study II: Creation and testing of measures

We used the framework developed in Study I to construct tools to assess beliefs about the importance of teaching knowledge and the source of teaching ability (i.e., the first two components of the proposed framework). Study II is an exploration of measures developed to assess these beliefs. The following research questions guided our efforts:

1. To what extent do items developed to assess beliefs about the importance of teaching knowledge and source of teaching ability reflect the previously identified themes?
2. Are data associated with the emergent factors reliable?
3. What are the relations among the emergent factors?

5.1. Item generation

5.1.1. Measure 1: Beliefs about teaching knowledge

We wanted to assess beliefs about the importance of knowledge in the areas of pedagogy, children, content and content specific pedagogy, and management and organization as identified in the framework generated in Study I (Table 4). We also added additional items based on our experiences with preservice teachers intended to tap beliefs about the importance of educational theory, including the importance of theory compared to specific teaching strategies or “tricks.”

We, the two researchers, initially developed items to address the importance of the different aspects of teaching knowledge independently. During this initial item generation, we were informed by the work from our qualitative study and attempted to mirror the language used by our participants. After the initial item generation, we compared, discussed, selected, and revised the items until we felt the items best addressed the areas of teaching knowledge identified in Study I. We maintained or discarded items based on how well they reflected the identified themes, if they were unique from other generated items, and if the ideas in the items, from our perspective, were clearly and unambiguously stated. Our intention was to have approximately five items per identified area.

This process resulted in 53 items. Our goal was to construct at least five items per aspect of teaching knowledge. However, the actual number varied depending on how many unique items we could generate that clearly reflected the themes and codes from Study I (Table 5). Additionally we constructed 10 items to assess the added area of theory and strategy knowledge (i.e., five items assessed the importance of knowing theory and five items assessed the importance of strategies compared to theory). We refer to this 53-item scale as the Importance of Teaching Knowledge Scale (ITKS).

The items were randomly listed in a single questionnaire titled “What do teachers need to know?” Participants were instructed to: “Respond to the following items by circling the appropriate number. These responses should be based on your beliefs. There are no right or wrong answers. Please respond to each item in the order it is presented.” For each item,
Table 5
Framework for instruments assessing teachers' knowledge and teaching ability beliefs

<table>
<thead>
<tr>
<th>Intended subscales</th>
<th>Content</th>
<th>Sample items: How important is it for teachers...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Importance of Teaching Knowledge Scale</strong> (55 items)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management and organization (9 items)</td>
<td>Control (4 items)</td>
<td>... know how to maintain order and control in the classroom?</td>
</tr>
<tr>
<td>Pedagogy (15 items)</td>
<td>Methods and practices (7 items)</td>
<td>... know how to structure a lesson to promote learning?</td>
</tr>
<tr>
<td>Organization (5 items)</td>
<td>Assessment (5 items)</td>
<td>... understand standardized testing?</td>
</tr>
<tr>
<td>Pedagogy (5 items)</td>
<td>Motivation (3 items)</td>
<td>... know how to motivate and engage students?</td>
</tr>
<tr>
<td>Content (9 items)</td>
<td>Pedagogical content knowledge (4 items)</td>
<td>... have expertise in the subject area(s) they teach?</td>
</tr>
<tr>
<td>Children (10 items)</td>
<td>Learning theory and child development (5 items)</td>
<td>... have knowledge of child/adolescent development?</td>
</tr>
<tr>
<td>Theory (10 items)</td>
<td>Students in own class (5 items)</td>
<td>... know their students' likes and dislikes?</td>
</tr>
<tr>
<td></td>
<td>Theoretical foundations of practices (5 items)</td>
<td>... understand the theory behind teaching techniques?</td>
</tr>
<tr>
<td></td>
<td>Strategy more important than theory (5 items)</td>
<td>... be taught strategies to use in the classroom compared to being taught theory?</td>
</tr>
<tr>
<td><strong>Teaching Ability Belief Scale</strong> (28 items)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innate (6 items)</td>
<td>Inborn, talent, instinct</td>
<td>Individuals are born with the ability to teach</td>
</tr>
<tr>
<td>Partly innate, requires polish (6 items)</td>
<td>Part innate and part learned, people are born with other qualities that help teaching</td>
<td>Teaching requires innate talent and pedagogical preparation</td>
</tr>
<tr>
<td>Innate for some, learned for others (5 items)</td>
<td>Some people are born able and others must learn</td>
<td>Some people have to learn how to teach, and other people are born with the ability to teach</td>
</tr>
<tr>
<td>Learned (5 items)</td>
<td>Can learn to teach, it can be taught, it requires training</td>
<td>Teaching is a learned activity</td>
</tr>
<tr>
<td>A calling (5 items)</td>
<td>Calling, a God-given gift or talent</td>
<td>Teaching is a calling</td>
</tr>
</tbody>
</table>
participants rated their perception of the importance of the knowledge indicated. Due to concerns about ceiling effects and variability within the data, we used a nine-point Likert scale with anchor points at the ends (i.e., 1: not important and 9: very important) and in the middle (i.e., somewhat important spanning 4, 5, and 6).

5.1.2. Measure 2: Beliefs about the ability to teach

We developed the Teaching Ability Belief Scale (TABS) based on the emergent themes from Study I using the methods described for the ITKS. Specifically, we independently generated items related to the five ability belief themes. We then compared items, selected those that best addressed the respective themes, and revised items to improve their clarity. This process resulted 28 items (Table 5).

Items related to the five themes were randomly presented in a measure titled “Where does the ability to teach come from?” Directions for the participants stated: “Respond to the following items indicating the extent to which you agree with each statement. These responses should be based on your beliefs. There are no right or wrong answers. Please respond to each item in the order it is presented.” Participants indicated their agreement using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

5.2. Examination of factor structure and psychometric properties of the measures

5.2.1. Method

5.2.1.1. Participants. Three-hundred and fifty one preservice teachers were recruited from education courses at two large, state universities in the United States, one in the southeast (n = 210) and one in the mid-south (n = 141). We sampled only preservice teachers because we believed preservice teachers may respond differently to the measures than practicing teachers and our primary contact and interest was with preservice teachers. The preservice teachers were predominantly female (70.4%). Additionally, 71.8% were European American, 17.9% African American, 3.7% Mexican-American, 2.6% Hispanic (other than Mexican-American), .9% Asian-American, and 2.6% described themselves as multiple or other ethnicities.

With respect to education level, 33.9% were university juniors and seniors, 29.3% were university freshmen and sophomore, 27.1% had received a bachelor’s degree, 2.6% had a master’s degree, and 3.2% had completed course work beyond the masters level. Almost half of the participants (46.2%) intended to teach at the high school level, 14.2% intended to teach at the middle school level, 35.3% intended to teach at the elementary school level, and 2.8% intended to teach all grade levels (i.e., special education, music, art, physical education).

5.2.1.2. Procedure. Participants completed the measures either in class or in small groups outside of class. Measures were presented in counterbalanced order with a consent form. Verbal as well as written directions instructed the participants to respond to each item based on their beliefs. Participants read and responded to the items individually. Most participants took 10 to 20 minutes to complete both measures.

5.3. Analysis and results

We submitted the data from the ITKS and the TABS to exploratory factor analytic procedures. Given our sample size as well as the differences between the constructs
addressed in each measure, data from the two measures were analyzed separately. For each data set, a principal components analysis was first conducted to determine the number of factors to extract. Because the Kaiser-Guttman rule (i.e., extracting factors with eigenvalues greater than one) often suggests more factors than are theoretically meaningful, we used parallel analysis (Horn, 1965) as recommended by Thompson and Daniel (1996) to determine the number of factors to extract. Once the number of factors to be extracted was determined, principal axis factoring was conducted and the emergent factor structure was examined. Reliability coefficients were computed as well as correlations between the factors.

Two separate factor analyses were conducted to determine if the factor structure was similar across grade levels [i.e., those intending to teach elementary and middle school ($n = 174$) and those intending to teach high school ($n = 161$)]. The nature of the factors was similar across subsamples. Thus, here we present the results for the full sample.

5.3.1. Preservice teachers’ beliefs about the importance of teaching knowledge

When participants’ responses to the ITKS were submitted to the initial principal components analysis, 10 factors had eigenvalues greater than one, ranging from 1.03 to 20.37. Parallel analysis suggested that five factors should be extracted accounting for 55.46% of the variance in the data.

Next, we employed principal axis factoring with oblimin rotation to aid in the interpretation of the factors. We chose a nonorthogonal rotation because we believed that the different belief factors may be related. That is, individuals who endorse statements about the importance of pedagogical knowledge would be likely to similarly endorse statements about the importance of classroom management knowledge.

Examination of the pattern coefficients indicated that 45 of the 53 items had coefficients greater than or equal to $|\cdot.40|$. These items were retained and assigned to the respective factors. There were no items with pattern coefficients greater than or equal to $|\cdot.40|$ on more than one factor. The pattern and structure coefficients, eigenvalues, and percentage of variance explained for the exploratory factor analysis of the ITKS data are presented in Table 6.

We examined the items to identify the emergent factors. All of the factors pertain to the importance of different aspects of knowledge necessary for teaching and the titles of each factor reflect the items associated with the factor. Factor I, Importance of Instructional Practices and Students, included 16 items; Factor II, Importance of Strategies over Theory, included 6 items; Factor III, Importance of Content and Pedagogical Content Knowledge, included 7 items; Factor IV, Importance of Knowledge of Theory and Development, included 6 items; and Factor V the Importance of Classroom Organization and Management, included 10 items.

Reliability coefficients for the data associated with the factors ranged from .73 to .92 (Table 7). Additionally, we computed mean composites for each emergent factor by summing the responses for items associated with the factor and dividing by the number of items. There were moderate to strong relations between the five factors. Means, standard deviations, and correlations are presented in Table 7.

5.3.2. Preservice teachers’ beliefs about the ability to teach

After analyzing the ITKS data, we used similar procedures to analyze responses to the TABS. Principal components analysis revealed six factors with eigenvalues greater than
Table 6
Pattern (structure) coefficients from the principal axis factoring with oblimin rotation of the Importance of Teaching Knowledge Scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. How important is it for teachers to be able to adjust their teaching methods to reach a variety of learners?</td>
<td>.67 (.72)</td>
</tr>
<tr>
<td>25. For teachers, how important is knowledge of how to motivate students?</td>
<td>.62 (.72)</td>
</tr>
<tr>
<td>32. How important is it for teachers to know how to present information in multiple ways?</td>
<td>.62 (.75)</td>
</tr>
<tr>
<td>29. How important is it for teachers to know the students they teach?</td>
<td>.59 (.58)</td>
</tr>
<tr>
<td>30. For teachers, how important is knowledge of how students learn?</td>
<td>.58 (.72)</td>
</tr>
<tr>
<td>9. For teachers, how important is knowledge of how children/adolescents learn?</td>
<td>.54 (.71)</td>
</tr>
<tr>
<td>12. How important is it for teachers to know how to motivate and engage students?</td>
<td>.53 (.67)</td>
</tr>
<tr>
<td>14. For teachers, how important is it to know how to deliver information so that students can understand it?</td>
<td>.52 (.59)</td>
</tr>
<tr>
<td>44. How important is it for teachers to know their students' likes and dislikes?</td>
<td>.50 (.66)</td>
</tr>
<tr>
<td>45. How important is it for teachers to know the signs of typical and atypical development?</td>
<td>.49 (.72)</td>
</tr>
<tr>
<td>4. How important is it for teachers to understand the cultural background of the students they teach?</td>
<td>.45 (.56)</td>
</tr>
<tr>
<td>16. How important is it for teachers to have knowledge of motivational practices?</td>
<td>.45 (.68)</td>
</tr>
<tr>
<td>17. How important is it for teachers to know the strengths and weaknesses of the students in the class(es) they teach?</td>
<td>.44 (.62)</td>
</tr>
<tr>
<td>15. How important is it for teacher education to focus on practical applications and teaching &quot;tricks&quot; rather than on educational theories?</td>
<td>.12 (.10)</td>
</tr>
</tbody>
</table>

I = 1st factor; II = 2nd factor; III = 3rd factor; IV = 4th factor; V = 5th factor.
6. How important is it for teachers to know “tricks of the trade” instead of educational theory? .04 (.09) .65 (.63) −.02 (−.11) .08 (−.07) .06 (−.05)

47. For teachers, how important is it to know how to implement teaching techniques even if they do not understand the theory behind them? −.06 (.11) .52 (.52) .06 (.10) −.02 (−.14) −.18 (−.20)

35. For teachers, how important is it to know effective classroom strategies without understanding why they are effective? −.18 (−.01) .51 (.51) −.04 (−.10) −.03 (−.10) −.08 (−.08)

43. How important is it for teachers to understand the theory behind “tricks” and strategies they use in the classroom? .02 (.26) .44 (.53) −.20 (−.35) −.32 (−.45) .14 (−.14)

21. How important is it for teachers to be taught strategies to use in the classroom, compared to being taught theory? .17 (.38) .43 (.51) −.27 (−.37) −.11 (−.33) −.14 (−.35)

6. How important is it for teachers to know “tricks of the trade” instead of educational theory? .04 (.09) .65 (.63) −.02 (−.11) .08 (−.07) .06 (−.05)

33. How important is expert subject matter knowledge for teaching? −.02 (.34) .08 (.22) −.80 (−.77) −.01 (−.26) .08 (.28)

10. How important is it for teachers to have extensive knowledge of the subject matter they teach? −.34 (−.44) −.19 (−.04) −.70 (−.68) −.08 (−.28) −.31 (−.31)

22. How important is it for teachers to know the overall structure and make up of the subject area(s) they teach? .14 (.44) −.01 (.14) −.63 (−.70) .03 (−.25) −.04 (−.39)

37. How important is it for teachers to know instructional methods for the specific content area(s) they teach? .08 (.53) −.01 (.19) −.56 (−.74) −.20 (−.48) −.15 (−.52)

50. How important is it for teachers to be aware of teaching techniques that are unique to each subject they teach? .33 (.68) .05 (.24) −.43 (−.70) −.10 (−.45) −.16 (−.58)

27. How important is it for teachers to understand the theory behind teaching techniques? −.44 (−.44) .05 (.25) −.19 (−.47) −.68 (−.78) −.08 (−.40)

19. For teachers, how important is it to have theoretical knowledge of educational practices? .02 (.45) .02 (.22) −.20 (−.47) −.66 (−.76) −.07 (−.41)

5. How important is it for teachers to know the theoretical foundations and implications of their teaching practices? .05 (.40) −.04 (.14) −.12 (−.38) −.58 (−.66) −.09 (−.37)

11. How important is it for teachers to understand why a teaching technique works? .19 (.50) .03 (.21) −.10 (−.39) −.58 (−.70) −.36 (−.36)

18. How important is it for teachers to have an understanding of child/adolescent development? .32 (.63) −.08 (.12) −.02 (−.40) −.49 (−.68) −.18 (−.53)

3. How important is it for teachers to have knowledge of child/adolescent development? .38 (.58) −.02 (.13) .12 (−.26) −.41 (−.58) −.14 (−.45)

53. For teachers, how important is it to know how to establish and maintain a classroom management system? −.06 (.45) −.02 (.12) −.01 (−.37) −.08 (−.34) −.82 (−.82)

(continued on next page)
<table>
<thead>
<tr>
<th>Items</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>46. How important is it for teachers to know how to manage class time?</td>
<td>.09 (.47)</td>
</tr>
<tr>
<td>31. How important is it for teachers to have knowledge of classroom management?</td>
<td>.22 (.58)</td>
</tr>
<tr>
<td>13. How important is it for teachers to know how to maintain order and control in the classroom?</td>
<td>.02 (.35)</td>
</tr>
<tr>
<td>20. How important is it for teachers to have a variety of classroom management skills?</td>
<td>.18 (.53)</td>
</tr>
<tr>
<td>39. For teachers, how important is it to be able to manage multiple needs and tasks at the same time?</td>
<td>.19 (.54)</td>
</tr>
<tr>
<td>1. For teachers, how important is it to know how to organize a classroom?</td>
<td>.03 (.43)</td>
</tr>
<tr>
<td>26. How important is it for teachers to know how to organize and maintain paperwork?</td>
<td>.08 (.48)</td>
</tr>
<tr>
<td>24. How important is it for teachers to know how to create classroom assessments?</td>
<td>.17 (.59)</td>
</tr>
<tr>
<td>8. How important is it for teachers to know how to use classroom assessment to inform instruction?</td>
<td>.15 (.53)</td>
</tr>
<tr>
<td>16. How important is it that teachers have administrative skills and abilities?</td>
<td>-.01 (-.38)</td>
</tr>
<tr>
<td>34. How important is it for teachers to know how to assess student performance?</td>
<td>.20 (.58)</td>
</tr>
<tr>
<td>42. How important is it for teachers to have knowledge of assessment practices?</td>
<td>.17 (.61)</td>
</tr>
<tr>
<td>36. How important is it for teachers to have knowledge of instructional practices?</td>
<td>.26 (.63)</td>
</tr>
<tr>
<td>7. How important is it for teachers to know how to use different teaching techniques depending on the content they are teaching?</td>
<td>.36 (.57)</td>
</tr>
<tr>
<td>2. How important is it for teachers to know a variety of teaching techniques?</td>
<td>.36 (.54)</td>
</tr>
<tr>
<td>52. How important is it for teachers to understand standardized testing?</td>
<td>.08 (.36)</td>
</tr>
<tr>
<td>28. How important is it for teachers to know subject specific teaching methods?</td>
<td>.12 (.52)</td>
</tr>
</tbody>
</table>

Eigenvalues 20.37 2.70 2.44 2.12 1.78
Percentage of variance explained 38.43 5.08 4.60 4.00 3.36
one, ranging from 1.16 to 6.65, and the parallel analysis suggested extracting four factors, accounting for 51.13% of the variance in the data.

Principal axis factor analysis with oblimin rotation was used to extract the four factors. Eleven items had pattern coefficients greater than or equal to |.40| on Factor I (Table 8). Seven items met this criterion for Factor II, four items for Factor III, and five items for Factor IV. None of the items had a pattern coefficient greater than or equal to |.40| on more than one factor.

Factor I represents beliefs about the ability to teach as an innate ability or a predestined calling (i.e., Innate Teaching Abilities). The items associated with Factor II suggest that the ability to teach was a learned skill (i.e., Learned Teaching Abilities) whereas the items associated with Factor III and IV represent more hybrid views of teaching ability. Specifically, Factor III represents the belief that the ability to teach is innate for some individuals but a learned skill for other individuals (i.e., Innate Teaching Abilities for Some, Learned for Others). In contrast, Factor IV represents that view that the ability to teach develops by refining and building upon one’s innate tendencies and skills (Innate Teaching Abilities that Require Polish).

Cronbach’s alpha coefficients for the data associated with the factors ranged from .70 to .87 (Table 9). Means, standard deviations, and correlations among the factors are presented in Table 9. An examination of the correlations indicated that that the Innate and Learned factors were not significantly related (i.e., r = −.08, p > .05). The hybrid views of teaching ability were moderately related to one another (i.e., r = .40, p < .01) and to innate views of teaching ability (i.e., rs = .43 and .46, respectively, ps < .01). In contrast, the hybrid views were only weakly related to beliefs in learned teaching abilities (i.e., rs = .20 and .23, respectively, ps < .01).

### 5.3.3. Correlations among knowledge and ability beliefs

We also examined the relations between participants’ responses to the two measures (Table 10). There were significant relations between all teaching ability beliefs and importance of knowledge of instructional practices and students. Additionally, teaching ability beliefs were similarly related to beliefs about the importance of strategy over theory and
Table 8

Pattern (structure) coefficients from principal axis factoring with oblimin rotation of the items from the *Teaching Ability Belief Scale*.  

<table>
<thead>
<tr>
<th>Items</th>
<th>Factors</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>20. Teachers are called to teach</td>
<td></td>
<td>.09 (.72)</td>
<td>.03 (.03)</td>
<td>.17 (.16)</td>
<td>-.27 (.48)</td>
</tr>
<tr>
<td>26. Teaching is a gift from God (or from deity)</td>
<td></td>
<td>.66 (.68)</td>
<td>-.01 (.10)</td>
<td>.01 (.25)</td>
<td>-.05 (.30)</td>
</tr>
<tr>
<td>24. Teachers naturally know how to teach and assess learning</td>
<td></td>
<td>.63 (.62)</td>
<td>.08 (.02)</td>
<td>-.10 (.31)</td>
<td>.01 (.18)</td>
</tr>
<tr>
<td>28. Teaching is “in the genes”</td>
<td></td>
<td>.62 (.59)</td>
<td>-.10 (.10)</td>
<td>.01 (.20)</td>
<td>.08 (.15)</td>
</tr>
<tr>
<td>19. Teaching is based on natural instinct</td>
<td></td>
<td>.61 (.66)</td>
<td>.07 (.02)</td>
<td>-.01 (.28)</td>
<td>-.16 (.41)</td>
</tr>
<tr>
<td>12. Teaching is something people know that they are meant to do</td>
<td></td>
<td>.55 (.56)</td>
<td>.06 (.01)</td>
<td>.01 (.22)</td>
<td>-.08 (.29)</td>
</tr>
<tr>
<td>17. Teaching is a calling</td>
<td></td>
<td>.53 (.66)</td>
<td>-.05 (.06)</td>
<td>.01 (.27)</td>
<td>-.31 (.50)</td>
</tr>
<tr>
<td>2. Individuals are born with the ability to teach</td>
<td></td>
<td>.48 (.51)</td>
<td>.16 (.22)</td>
<td>-.19 (.31)</td>
<td>.09 (.10)</td>
</tr>
<tr>
<td>15. The ability to teach is innate</td>
<td></td>
<td>.46 (.59)</td>
<td>-.04 (.08)</td>
<td>-.37 (.53)</td>
<td>.02 (.25)</td>
</tr>
<tr>
<td>4. Some people are destined to become teachers</td>
<td></td>
<td>.41 (.54)</td>
<td>-.10 (.12)</td>
<td>-.20 (.37)</td>
<td>-.12 (.30)</td>
</tr>
<tr>
<td>7. Teaching is a talent; some people have it, and some people don’t</td>
<td></td>
<td>.41 (.54)</td>
<td>-.12 (.12)</td>
<td>-.12 (.31)</td>
<td>-.18 (.34)</td>
</tr>
<tr>
<td>18. The ability to teach is learned</td>
<td></td>
<td>.07 (.05)</td>
<td>.85 (.84)</td>
<td>.02 (.09)</td>
<td>-.02 (.22)</td>
</tr>
<tr>
<td>23. Teaching is a learned activity</td>
<td></td>
<td>-.04 (.10)</td>
<td>.75 (.78)</td>
<td>-.08 (.14)</td>
<td>-.06 (.22)</td>
</tr>
<tr>
<td>9. Teaching is a learned skill</td>
<td></td>
<td>-.09 (.16)</td>
<td>.73 (.75)</td>
<td>-.02 (.07)</td>
<td>-.05 (.18)</td>
</tr>
<tr>
<td>5. The skills needed to become a teacher are learned</td>
<td></td>
<td>.08 (.02)</td>
<td>.68 (.68)</td>
<td>.11 (.01)</td>
<td>-.11 (.24)</td>
</tr>
<tr>
<td>13. Teaching is a skill that is developed with training and expertise</td>
<td></td>
<td>-.11 (.05)</td>
<td>.57 (.65)</td>
<td>-.16 (.23)</td>
<td>-.24 (.36)</td>
</tr>
<tr>
<td>6. Although some people may be born with the ability to teach, anyone</td>
<td></td>
<td>.16 (.06)</td>
<td>.52 (.48)</td>
<td>-.11 (.16)</td>
<td>.16 (.04)</td>
</tr>
<tr>
<td>can learn how to teach with training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Teaching is not an innate talent, it is developed through</td>
<td></td>
<td>-.13 (.26)</td>
<td>.52 (.52)</td>
<td>.15 (.16)</td>
<td>.01 (.01)</td>
</tr>
<tr>
<td>experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Teaching is innate for some individuals and learned for others</td>
<td></td>
<td>.03 (.32)</td>
<td>.06 (.14)</td>
<td>-.68 (.74)</td>
<td>-.14 (.36)</td>
</tr>
<tr>
<td>11. Some people have to learn how to teach, and other people are</td>
<td></td>
<td>.21 (.47)</td>
<td>.05 (.02)</td>
<td>-.68 (.75)</td>
<td>-.14 (.26)</td>
</tr>
<tr>
<td>born with the abilities to teach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Although some people are natural teachers, others can learn how</td>
<td></td>
<td>-.17 (.03)</td>
<td>.37 (.47)</td>
<td>-.54 (.56)</td>
<td>-.14 (.31)</td>
</tr>
<tr>
<td>to teach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. For some people, teaching is a learned skill; for other people,</td>
<td></td>
<td>.05 (.26)</td>
<td>-.02 (.02)</td>
<td>-.54 (.56)</td>
<td>-.01 (.18)</td>
</tr>
<tr>
<td>teaching is an innate talent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Teaching is a talent that is improved with training</td>
<td></td>
<td>-.15 (.20)</td>
<td>-.02 (.16)</td>
<td>-.29 (.42)</td>
<td>-.65 (.68)</td>
</tr>
<tr>
<td>21. Teachers have natural abilities that are developed through</td>
<td></td>
<td>.07 (.26)</td>
<td>.15 (.27)</td>
<td>.02 (.20)</td>
<td>-.60 (.66)</td>
</tr>
<tr>
<td>training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. The ability to teach is part nature and part nurture</td>
<td></td>
<td>.12 (.27)</td>
<td>.10 (.17)</td>
<td>.01 (.17)</td>
<td>-.44 (.50)</td>
</tr>
<tr>
<td>10. To be a teacher, individuals have to develop their natural</td>
<td></td>
<td>.08 (.23)</td>
<td>.13 (.21)</td>
<td>-.03 (.19)</td>
<td>-.43 (.49)</td>
</tr>
<tr>
<td>abilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Teaching ability comes from tendencies teachers are born with and</td>
<td></td>
<td>.21 (.39)</td>
<td>-.14 (.08)</td>
<td>-.04 (.22)</td>
<td>-.40 (.46)</td>
</tr>
<tr>
<td>from the education they receive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Teaching ability requires innate talent and pedagogical preparation</td>
<td></td>
<td>.20 (.37)</td>
<td>-.07 (.02)</td>
<td>-.05 (.23)</td>
<td>-.38 (.45)</td>
</tr>
</tbody>
</table>

Eigenvalue: 6.65, 4.45, 1.73, 1.50  
Percentage of variance explained: 23.74, 15.89, 6.17, 5.34
the importance of classroom organization and management knowledge. However, beliefs in innate teaching ability and learned teaching ability were differentially related to individuals’ beliefs about the importance of content and pedagogical content knowledge and the importance of theory and development.

Specifically, beliefs about learned teaching abilities were significantly related to beliefs about the importance of knowledge of theory and development and content and pedagogical content knowledge. Beliefs about innate teaching abilities were not significantly associated with these knowledge importance beliefs. A statistical comparison of the correlations revealed that learned teaching ability beliefs were more strongly related to beliefs about the importance of knowledge of theory and children and content and pedagogical content knowledge than were innate teaching ability beliefs ($z > 1.71$; $p < .05$). These findings suggest that those who view teaching as a skill or ability that is learned or acquired over time value different types of knowledge than those who view teaching as an innate ability.

5.4. Discussion

The results of these analyses suggest that the Importance of Teaching Knowledge Scale and Teaching Ability Belief Scale are valid measures of aspects of preservice teachers’
beliefs and that the data from these measures are reliable. Specifically, we designed the ITKS to assess the five themes identified in our prior work as well as beliefs about the importance of educational theory. In this study, factor analytic procedures suggested a five-factor solution that closely mapped on our original themes and expected results.

There were also differences between what we expected and the factors we identified. Items related to knowledge of instructional practices and knowledge of children were associated with each other on the same factor. Specifically, eight items intended to address beliefs about children (i.e., students in general and a teacher’s specific students) were associated with items related to instructional practices and motivation. This association is meaningful because these items all described teachers’ need to understand their students and the processes of learning and teaching which are, we believe, inherent to knowledge of teaching practices and methods.

Similarly, two of the assessment items (i.e., items 8 and 24) were associated with the classroom management and organization factor. Upon reflection, it seems reasonable that the knowledge of how to create (i.e., item 24) and use classroom assessments to inform instruction (i.e., item 8) may fit into participants’ understanding of the administrative or organizational aspects of the teaching profession. Additionally, the participants in this study were preservice teachers who may not fully appreciate the relation between instruction and assessment.

Two of the five theoretical factors associated with the TABS instrument collapsed together (i.e., Teaching Ability is Innate, and Teaching is a Calling) and the remaining three factors mapped directly onto the organizing framework that emerged from our findings in Study I. That items related to teaching ability as innate and as a calling, or gift from God, combined is not surprising. Both of these themes are associated with a lack of control on the part of the person learning to teach.

These findings are based on data from preservice teachers, therefore, we need to conduct similar analyses for groups of practicing teachers to confirm or disconfirm the factor structure and relations among the variables. Despite this limitation, our findings suggest that the items we developed may serve as a tool for exploring beliefs about teaching knowledge and teaching ability. Specifically, for the ITKS, items were developed to assess how important individuals viewed the knowledge needed for teaching. The moderate to strong positive correlations among the factors from the ITKS measure indicate that preservice teachers’ views of the importance of different aspects of teaching knowledge are related to one another. Some may view this as problematic. However, this is to be expected as all of the factors address different areas of knowledge used in the same practice (i.e., teaching). Consequently, depending on the purposes of a given study, investigators may choose to use a composite of several of the factors or to use only those factors that are most relevant to their research questions.

Further, the TABS items were developed to address beliefs about the nature of the ability to teach. Distinct factors emerged relative to whether teaching is an innate ability, a learned skill, or a combination of the two. This measure may prove useful in exploring individuals’ beliefs about teaching in relation to other constructs. As seen in this investigation, teaching ability beliefs were differentially related to the valuing of different aspects of teaching knowledge. This finding has important implications for teacher education and practice. If individuals value different types of knowledge based on their teaching ability beliefs, they may be more or less receptive to knowledge and experiences within their teacher education programs. More specifically, an individual with more innate views of
teaching ability may focus more on learning specific teaching strategies rather than understanding the theoretical basis of those strategies. Such relations and implications need to be explored in future investigations.

6. Limitations of study I and study II

There are additional limitations that are important to acknowledge regarding the work presented. For instance, the samples in both studies draw from the preservice and practicing teacher populations from two regions of the United States and the samples were predominantly Caucasian and female. Thus, we cannot claim that the framework we identified is fully reflective of all preservice and practicing teachers. However, we view the use of populations from two regions, as opposed to one, as a strength of our work and recommend additional research with more diverse samples.

There are also specific limitations associated with the two studies. For Study I, the use of questionnaires to gather the qualitative data prevented us from asking follow-up and clarifying questions. Consequently, some of our interpretations of the data may be limited due to the lack of clarity. However, this data did allow some insight into teachers’ beliefs and provided us access to the language practicing and preservice teachers use to describe their beliefs.

It is also important to recognize that the framework used to create these measures was based on data gathered from both preservice and practicing teachers (i.e., Study I). However, in Study II we tested viability of our new scales on preservice teachers only. Preservice teachers may have naıve beliefs about the teaching profession and the knowledge needed to be successful in the classroom. Preservice teachers are likely to have had few opportunities to assess teaching ability and to contemplate beliefs about the origins of those abilities. Practicing teachers may respond differently based on their more seasoned perceptions of teaching and personal experiences. Given the preliminary and exploratory nature of this work, we explicitly chose to focus on one population at a time. In the future, we intend to collect additional data from practicing teachers to determine the factor structure that will emerge from their data.

Additionally, our sample of preservice teachers was relatively small and prevented us from conducting more sophisticated analyses (e.g., confirmatory factor analysis). Finally, participants’ interpretations of the items through follow-up think-aloud protocols would further strengthen findings regarding the measures developed. We intend to address these issues in future investigations.

7. Conclusions and implications

The findings from Studies I and II have implications for both practice and research. Practically, our current findings provide insight into the beliefs and cognition of preservice and practicing teachers. Teacher educators can use this information to address the specific misconceptions and naıve beliefs that may hinder the development of effective teaching practice.

From a research perspective, the measures developed can be used to explore teacher knowledge beliefs and teaching ability beliefs in relation to preservice and practicing teachers’ practice, motivation, and development in greater depth. Understanding these relations may offer ways to further improve teacher education and professional development. For
example, a deeper understanding of the relations among teachers’ beliefs may facilitate the development of experiences and programming to foster beliefs that support teachers’ practice, motivation, and development and to target those beliefs that are less adaptive.

We hypothesize that preservice teachers possess varied beliefs about the knowledge they will need to teach as well as the nature of the ability to teach. Understanding future teachers’ beliefs as well as how their beliefs are related to teaching practices and motivation may allow teacher educators to plan instruction that will best support the development of teachers. These beliefs may also play a role in what the preservice and practicing teachers learn in their course work and professional development experiences. Individuals may, or may not, use specific study strategies depending on how they conceptualize teaching knowledge. Further, they may value different aspects of teaching knowledge depending on how connected they view that knowledge to teaching practice. For example, if preservice teachers do not recognize the value or even the existence of pedagogical content knowledge they may devalue their methods courses and discard potentially valuable course material.

If teacher educators can identify areas of teaching knowledge teachers and preservice do not particularly value, they can more explicitly address issues related to the importance of that knowledge in class. Further, if preservice teachers’ beliefs about teaching ability are related to the areas of knowledge they value, as suggested by our results, one means of addressing value may be to address ability beliefs. And to do so, one must also understand the nature and implications of individuals’ teaching ability beliefs.

The attribution literature suggests that fixed views of teaching ability may be problematic for future motivation. That is, when teachers with innate beliefs experience difficulties in the classroom they may question their teaching ability and their sense of teaching efficacy may decrease. They may determine that they are not “cut out” to teach and leave the profession or resign themselves to being “bad” teachers. Teacher educators, mentors, and administrators who are aware of these beliefs as well as their potential negative consequences, can foster beliefs that are more adaptive by encouraging teachers to see teaching more as a skill to be developed and that even if aspects are innate, polishing and training is still needed.

Our findings suggest areas for future research. For instance, participants’ need to emotionalize the profession of teaching is one avenue for future investigation that we did not anticipate. It may also prove fruitful to examine teachers’ beliefs about teaching knowledge and ability with longitudinal and cross-sectional methodologies. Such studies would indicate whether these beliefs are developmental in nature and change as one experiences the profession. Studies examining the relation of these beliefs among student and cooperating teachers may also help to explicate the ways these relationships can be fostered. For example, preservice teachers with entity perspectives on teaching ability and high value of strategies over theory may find the student teaching experience more meaningful when paired with a cooperating teacher who holds an incremental theory of teaching ability and values multiple aspects of teaching knowledge. Future investigations may address other beliefs about teaching knowledge. For example, using responses to other questions on our open-ended measure we have begun to explore preservice and practicing teachers’ beliefs about the source of teaching knowledge (e.g., Buehl & Fives, 2008).

These proposed relations are complex and draw from research on teacher beliefs, teacher knowledge, implicit theories, personal epistemology, and motivation. Empirical research is needed to more fully test and examine the connections among these constructs.
The work presented here provides an initial step by demonstrating how preservice and practicing teachers articulate their beliefs and by offering measures to study these beliefs.

**Appendix. Teaching knowledge beliefs questionnaire**

*Directions:* Respond to the following questions based on your beliefs. There are no right or wrong answers. If you need additional space, please use the back of the page.

Please respond to the questions in the order that they are presented. DO NOT examine or respond to the questions out of order (i.e., do not look forward or backward as you respond).

1. What is teaching?
2. Is teaching a talent people are born with? Please explain.
3. What do you believe is the purpose of schools?
4. What knowledge is necessary for effective teaching? Please be specific.
5. Describe your philosophy of teaching.
6. In the next 20 years...
   a. How much do you think the knowledge needed for effective teaching will change?
   b. In what way(s) do you think the knowledge needed for teaching will change?
      Please provide specific examples.
7. Where does knowledge of how to teach come from?
8. What knowledge do teachers hold that is unique to the teaching profession?
9. Can someone learn how to be an effective teacher? Please explain.
10. If you could design your own teacher education program what elements would you include? Please explain.
11. Choose one or more of the following that best represents your beliefs about teaching? Please explain your selection(s).
   a. Teaching is an art.
   b. Teaching is a science.
   c. Teaching is persuasion.
   d. Teaching is transmission.
   e. Teaching is transformation.
   f. Teaching is modeling.
   g. Teaching is scaffolding
   h. Teaching is —— (add your own).
12. The following Teacher Goals have been identified in a variety of research studies. Please rank these goals in order of importance based on your own belief system from 1 (*most important*) to 13 (*least important*).

---

Teachers should emphasize...

- Equality among students
- The products of learning
- Instruction based on student interests
- Student independence
- Learning standards
- Content specific knowledge
- Academic excellence
- Critical thinking in students
– Life-long learning
– Generalized skills and abilities
– Instruction based on subject matter
– The process of learning
– Student creativity

References


