Slovak Pre-Service Teacher Self-Efficacy: Theoretical and Research Considerations

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Abstract
The concept of self-efficacy was originally developed by Albert Bandura, and has been defined as the personal belief that one is capable of performing in an appropriate and effective manner to attain certain goals. As such, self-efficacy is a self-system that controls most personal activity, including appropriate use of professional knowledge and skills. Teacher self-efficacy is the belief that teachers have about their abilities and skills as educators. Teacher self-efficacy has been shown to be an important characteristic of the teacher and one strongly related to success in teaching. Unfortunately, however, effective measurement of teacher self-efficacy has been limited in part by geography. Therefore, described herein is a validation study for the Teacher Efficacy Scale in Slovakia. A shortened version of the original Gibson and Dembo questionnaire was translated into Slovak and administered to a sample of pre-service teachers in Bratislava. The obtained score data were factor-analyzed. Two relatively independent factors emerged: personal teaching efficacy and general teaching efficacy. The two factors accounted for 43.4% of the explained variance and the coefficient alpha for each factor was .73. Pre-service students’ scores on both teaching self-efficacy and general teaching efficacy exceeded the midpoint of the scales, indicating they had positive self-efficacy. Comparisons to other studies with similar samples in three countries showed surprisingly similar results.

Key words: pre-service teachers, self-efficacy, social cognitive theory, efficacy expectations, outcome expectations, Teacher Efficacy Scale, personal teaching efficacy, general teaching efficacy
Background

Educational research has long been focused on attempting to identify factors that affect, and specifically improve, teacher effectiveness. Questions addressed have included what personal qualities do teachers actually possess, what are the ideal qualities of an effective teacher, and what is the nature and extent of the differences between the ideal and real qualities of teachers? A large portion of this research stream has been devoted to determining what educational and subject matter knowledge and skills the teacher has, or should have, to be effective and successful (e.g., Kolektív autorov, 2006; Lukášová-Kantorková, 2003; Spilková, 1997). However, there are other teacher characteristics besides professional knowledge and skills that are important in teaching. In this paper we concentrate on teacher self-efficacy, a self-regulatory, relatively broad, psychological belief system that influences most teacher behaviour, including teaching performance.

The Nature of Teacher Self-Efficacy

Self-efficacy is the personal belief that one is capable of performing in an appropriate and effective manner to attain certain goals (Ormrod, 2006). It exists in many domains of human functioning, including both professional and private behaviour. Specifically in an educational context, teacher self-efficacy is the teacher’s personal (i.e., self-perceived) belief in ability to plan instruction and accomplish instructional objectives. It is in effect the conviction the teacher has about his/her ability to teach pupils efficiently and effectively.

Teacher self-efficacy should be distinguished from teacher “competence,” which is usually interpreted and/or applied to refer to (only) the teacher’s professional knowledge and skills. Teacher self-efficacy is a broader concept, and in fact high self-efficacy underlies and enables successful use of professional knowledge and skills, or conversely, low self-efficacy inhibits effective use of professional knowledge and skills. Thus, teacher self-efficacy is a strong self-regulatory characteristic that enables teachers to use their potentials to enhance pupils’ learning. It should be acknowledged that teacher self-efficacy is related to “perseverance;” the stronger the self-efficacy, the greater the perseverance -- and the greater the perseverance, the greater the likelihood that the teaching behaviours will be successful.

Teacher self-efficacy is a construct that was developed within the context of Bandura’s social-cognitive theory. Bandura defined self-efficacy as the belief about one’s own capabilities to organize and execute a certain task (Bandura, 1997). Self-efficacy beliefs influence thought patterns and emotions, which in turn enable or inhibit actions. According to Bandura’s theory, self-efficacy has two components: efficacy expectation and outcome expectancy. The former is the conviction that one has the ability, knowledge, and skills to successfully execute the behaviour or actions required to produce the desired outcome(s). The latter represents a person’s estimate of the likely consequences (impact) of performing a task at the self-expected level of performance. That is, outcome expectancy is the belief that a given behaviour or action will indeed lead to expected outcome(s). To be successful, the teacher must have both high efficacy expectations and high outcome expectancy. If the teacher has the former and not the latter, it is unlikely that the teacher will be successful teacher even if the teacher is professionally well-qualified.

According to Bandura’s theory, four sources” enhance development of high teacher self-efficacy: (a) mastery learning experiences, (b) vicarious experiences, (c) social persuasion, and (d) physiological and emotional states.

Mastery teaching experiences are situations in which teachers demonstrate their own teaching success, thus proving that they are competent teachers. “Enacted mastery (teaching) experiences are the most influential source of [self-] efficacy information because
they provide the most authentic evidence of whether one can muster whatever it takes to succeed. Success builds a robust belief in one’s personal efficacy” (Bandura, 1997, p. 80). Basically, as the adage indicates, nothing succeeds like success.

Whenever teachers engage in teaching activities, they interpret their results and use these interpretations to develop beliefs about their ability to engage in similar activities. If these activities are consistently successful, they tend to raise self-efficacy or, conversely, if these activities typically produce failure, self-efficacy is likely to be lowered. Therefore, if a teacher initially has a low sense of efficacy, it will bring doubt about his/her abilities. Such doubt likely will result in failure in teaching, and also reinforce low self-efficacy. Further information about discordance between self-efficacy and action can be found in Bandura (1997). Also, Zelina (1995) discussed the relationship between self-concept and self-efficacy, and the importance of self-reflection in building self-efficacy.

**Vicarious experience** is learning from observation of the successes of other teachers. Observing and modelling successful teachers may generate expectations that teachers can learn from successes of colleagues, which in turn, can result in their own positive self-efficacy. In brief, teachers can learn to be effective by watching the behaviours of others being effective.

**Social persuasion** by colleagues and superiors that a teacher can teach successfully will enhance the teacher’s self-efficacy. For example, coaching and giving encouraging feedback are commonly used actions that likely influence teacher self-efficacy positively. Essentially, emotional support builds a teacher’s belief in teaching self-efficacy.

**Physiological and emotional states** of the teacher influence self-efficacy judgments. For example, a teacher’s excitement and enthusiasm can provide cues about anticipated teaching success. On the other hand, stress, anxiety and other negative states can lead to negative judgments of teacher abilities and skills. This is in part what differentiates teacher self-efficacy, as a broader concept, from teacher confidence. A teacher who is professionally well-qualified may not be a successful teacher if personal negative or inhibiting emotional factors come into play. In general, the more narrowly defined concept of (teacher) confidence is less influenced by emotional factors outside the realm of teaching than is teacher self-efficacy.

**Teacher Self-Efficacy and Classroom Behaviour**

The growing body of research on teacher self-efficacy suggests that it may account for individual differences in teacher effectiveness. For example, teacher self-efficacy has been found to be consistently related to positive teaching behaviour and strong pupil achievement, pupils learn more from teachers who have high self-efficacy, and highly self-efficacious teachers are more likely to use open-ended questions, inquiry methods, or small group learning activities for students. They are also more persistent at a task, take more “risks” (e.g., are more willing to try not-yet-tested teaching activities), and are more likely to use innovative elements in their teaching. Teachers with high self-efficacy also are more open to new ideas, more willing to adopt innovations, are less likely to experience burn-out, support pupils’ autonomy to a greater extent, and are more attentive to low ability students (Brouwers & Tomic, 2003; Henson, 2001; Ross & Bruce, 2007). Finally, teachers with high self-efficacy exhibit greater enthusiasm for teaching, have greater commitment for teaching, and are more likely to remain in the teaching profession (Tschannen-Moran & Hoy, 2001).

**Measuring Teacher Self-Efficacy**

Teacher self-efficacy has at least a 25 year history of research. Presumably, the first attempt to measure teacher efficacy was by the RAND Foundation. RAND researchers inserted two
“sense of self-efficacy” items in their questionnaire first in a study in which success in reading programmes was examined and then in a second study in which effects of funding of educational programmes was investigated. Teachers’ sense of self-efficacy proved to be an unexpected, but important, factor that had strong, positive relationships to students’ performance, achievement of programme goals, and other positive (educational) outcomes (Armor et al., 1976).

Independent of the RAND research, Guskey (1981) investigated how teacher locus of control was related to teacher self-perceived responsibility for student achievement (RSA). Teacher self-efficacy is conceptually similar to but not exactly the same as RSA. To conduct the research, Guskey developed a measure to indicate how much teachers assume personal responsibility for student success or failure. Based on his findings, he concluded that there were two distinct qualities underlying RSA, meaning that RSA was not a unitary dynamic. Guskey’s work on RSA inspired Gibson and Dembo to develop a measure of teacher self-efficacy.

Gibson and Dembo (1984) were first to develop an instrument specifically to measure teacher self-efficacy. Their instrument, the Teacher Efficacy Scale (TES), has been used in many studies and is considered to be a “standard” tool for measuring the teacher self-efficacy construct. The original TES had 30 items. Later, they developed a short form having only 16 items but better psychometric qualities. Still later, other researchers developed a 10-item version found to have psychometric qualities roughly equivalent to those of the 16-item version. In its various forms, the TES has been used in a variety of school environments and at diverse types of schools, administered to in-service teachers who taught across a variety of school subjects, and used with pre-service teachers. It also inspired researchers to develop and use similar instruments, especially subject-specific measures such as ones for teaching mathematics (Charalambos, Philippou, & Kyriakides, 2007), science (Cakiroglu, Cakiroglu, & Boone, 2005), chemistry (Enochs, Smith, & Huinker, 2000), or character formation (Milson, 2003).

The structure of the TES includes two dimensions labelled (a) personal teaching efficacy and (b) general teaching efficacy. The latter was originally named simply teaching efficacy but because it was frequently confused with the first component, it was later renamed general teaching efficacy. TES respondents use a six-point, Likert-type response scale ranging from “strongly agree” to “strongly disagree.” Higher (i.e., more positive) scores represent higher self-efficacy.

**Personal Teaching Efficacy (PTE)** represents a teacher’s belief that he/she possesses the skills and abilities to facilitate student learning, that is, it is the teacher’s overall sense of his/her own teaching effectiveness. Items 1 and 6 in Table 2 are examples of PTE measurement.

**General Teaching Efficacy (GTE)** represents the belief that teaching (as an organizational form of education) can affect pupils positively, even in light of external factors or conditions such as low motivation or poor home environment. Items 5 and 7 are examples of GTE measurement.

According to Gibson and Dembo, GTE is a teacher’s personal beliefs about the relationship between his/her teaching and pupils’ learning; essentially, it corresponds to what Bandura called outcome expectancy.

Gibson and Dembo (1984) found that teachers who scored high on both dimensions were less likely to criticize a student following an incorrect answer and more likely to persist if a student failed a learning task initially. High-efficacy teachers also were more likely to divide a
class for small group instruction as opposed to whole-class instruction. Other researchers have found similar results.

Research
The primary goal of this research was to validate the Slovak version of the TES. The following criteria were set to achieve this goal:

1. Two factors determined to represent the PTE and GTE dimensions.
2. Two factors relatively independent of each other.
3. Factors extracted account for at least 28.8% of the total (explained) variance [which is the percentage achieved by Gibson and Dembo (1984) in their original research].
4. Reliabilities of at least .79 for each factor scale (which is what was found by Gibson and Dembo (1984) in their original research).

A second major goal was to collect data on Slovak pre-service teachers’ self-efficacy.

The original, 30-item TES was translated into Slovak by an experienced translator who rendered a substantive but not entirely literal version of the items; the items were adapted to reflect the Slovak educational environment. The translated version (TES-SK) was then reviewed by several university-based educational professionals. Subsequently, some item wordings were modified to improve comprehensibility.

Sample
The translated and refined TES-SK was administered to 135 students enrolled in five year teacher education programmes at the Faculty of Education, Comenius University in Bratislava. Prior to completing the TES-SK, all university student respondents had completed at least 20 hours of school-based classroom observation, and the majority had at least 40 hours of classroom observation. None of the participants had actual teaching experience. The original sample included 16% year one students (n = 21), 40.5% year two students (n = 55), 16% year three students (n = 21), 14.5% year four students (n = 20), and 13% year five students (n = 18).

Upon post-administration review, it was found that there was considerable, likely spurious, variations in the responses of the year one students, most probably because these students were in the initial semester of their programmes and were inexperienced about effective teaching practices. Therefore, their data were excluded from further analysis, and the final sample consisted of 114 respondents. There were eight males in the final sample. Although relatively small, the sample size is sufficient because it exceeds the typically and often recommended minimum of 100 respondents for factor analysis (e.g., see Garson, 2008).

Data Analyses
A principal component factor analysis with varimax normalized rotation was performed. Determination of the number of factors to retain included applications of the Kaiser criterion (i.e., eigenvalues greater than one) and the scree test. Items that loaded .30 or higher on a factor were retained.

Two component factors emerged and they accounted for 34% of the total (explained) factor variance. The first factor was deemed to represent PTE and the second was deemed to represent GTE. Ten items had factor loadings greater than .30 on the first factor, seven items had factor loadings greater than .30 on the second factor, and one item loaded greater than .30 on the two factors. Because of the dual loading, this latter item was dropped from the further analysis and interpretation. In general, the results were similar to those found for the 16 item
version of the instrument. The respective coefficient alphas for the items retained on these factors were .76 and .45.

The initial analysis yielded data that were encouraging because of their similarity to results from other similar studies. Also, the explained total variance was not optimal, but it was higher than that found in the original Gibson and Dembo (1984) research. However, the low reliability for the second (GTE) factor was problematic. Therefore, a second phase of analysis was undertaken to attempt to improve the psychometric qualities of the TES-SK.

In the second analysis, items that loaded .50 (a relatively rigorous criterion) or more on any of the factors in the original factor analysis were identified and retained as the data set. The data from these items were then factor analyzed using the same procedures and criteria as applied in the first analysis.

Again, two factors emerged. Applying the greater-than-.30 factor loading criterion, ten items were retained. Importantly, each item retained loaded highly on only one factor. These two factors account for 43.4% of the total (explained) factor variance, which is greater than in the previous analysis and 15% more than that in the Gibson and Dembo (1984) research. The first factor, again identified as PTE, explained 27.2% and the second factor, again identified as GTE, explained 16.2%. As expected, it also was determined that the inter-factor correlation was low at .15. The TES-SK factor structure resulting from this analysis is shown in Figure 1.

The respective coefficient alphas for the items retained on these factors were .73 and .54. In this version, the reliability of the first factor items is satisfactory, but the reliability of the second factor items was relatively low.

The final form of the TES-SK contains ten items, similar to the briefest version of the original TES that has been used. The first factor contains six items and the second contains four items.

Results and Discussion

The final version of the TES-SK containing 10 items met three of the four a priori criteria set for this validation study: (a) a two-factor solution was found and the factors appeared to represent PTE and GTE, (b) independence between the factors was shown, and (c) and the total factor (explained) variance was greater than 29%. The fourth criterion was not achieved in that the reliabilities found did not reach the criterion. However, the reliability of the first factor items was relatively high. Overall, the Slovak version of the Teacher Efficacy Scale (i.e., TES-SK) has good and substantive, though not ideal, psychometric properties, and therefore may be used cautiously in future research.

The PTE and GTE factors were shown to be relatively independent, which suggests that a teacher may have high personal teaching efficacy but may believe that influences external to his/her efficacy affect pupils’ learning, or vice versa. Thus, a teacher may be convinced of his/her own ability to teach (PTE) but doubtful about his/her pupils’ ability to learn successfully (GTE), or may believe that his/her pupils’ ability to learn is irrespective of his/her own inability to teach.

Several reasons may underlie why the data for the second factor (GTE) of the TES-SK are not as clear or as strong as those for the first factor. Woolfolk and Hoy (1990) and Deemer and Minke (1999) offered an interpretation that the two dimensions of TES represent two very different constructs. The first (PTE) refers to individual (i.e., personal) teacher efficacy; note the use of “I” or “my” pronouns in PTE items. The second (GTE) includes items that refer to a rather generalized concept of a teacher or situations external to the teacher’s classroom; in other words, a much less personalized context. It may be that generalized conceptualizations of teaching have more varied components than do personal conceptualizations of teaching.
Although the TES-SK psychometric properties could have been better, they are sufficient for initial investigation of the resultant item data. As for other forms of the TES, higher scores reflect higher the teacher self-efficacy. Each TES-SK item theoretically had a midpoint score of 3.5. As shown in Table 1, found in this study was that individual item overall means exceeded the midpoint for both dimensions. This suggests that the student participants believed that they can teach efficiently and effectively, and that teaching is not much affected by factors outside their control as teachers.

The PTE item means were higher than those for GTE and review of the standard deviations shows greater spread for the GTE items. This finding is in accord with similar studies of in-service or pre-service teacher self-efficacy. It suggests that the respondents were more varied in regard to their perceptions of teaching efficacy in general than they were in regard to their own teaching efficacy.

Individual item means are shown in Table 2. Among the four highest PTE item means, three are related to belief in efficacy in managing pupils’ learning and the other is related to belief in efficacy in managing pupil discipline. Managing pupil discipline is one of the more difficult tasks with which a teacher is confronted. Perhaps these student respondents’ high perceived self-efficacy to manage pupil discipline has not yet been tested in the reality of actual classrooms?

The lowest PTE item means (6 and 8) are related to concerns about pupil progress expressed as grades. It is laudable that the student respondents believe in their own self-efficacy in regard to helping pupils achieve better grades. Hopefully, such belief would prompt them as teachers to teach better and not to simply raise pupils’ grades because they believe they are teaching better.

A broader context of understanding the results here can be achieved by comparing them to those found in other countries. Thus, studies which had comparable samples and used similar self-efficacy instruments with six-point item scales were examined. Woolfolk (2000) administered a 10-item teacher efficacy scale to students at a teachers’ college in the USA. Similarly, Charalambos, Philippou, and Kyriakides (2007) investigated student teacher self-efficacy in the USA and in Turkey. Wertheim and Leyser (2002) measured self-efficacy in pre-service teachers in Israel. Table 3 shows and allows comparison of the resultant respective data sets. In all the studies, PTE item mean scores exceed four points, and are surprisingly similar. The greatest difference is between the highest score for USA 2 and the lowest score for USA 1 at .53. This suggests that even across varied educational and cultural environments, pre-service teachers have similar levels of self-efficacy beliefs. In addition, the PTE scores are all rather high and are a good precondition to enable these students to be efficacious teachers after entering the profession.

A similar trend is evident in the GTE item mean scores. Differences among GTE item mean scores across the studies also are small. The greatest difference is between the highest scoring Turkish students and the lowest scoring Slovak students, but is only .68. It also may be observed that the GTE item mean scores in all the countries except Turkey are lower than PTE item mean scores. However, the difference between PTE and GTE scores in pre-service students in Turkey is only .12. This finding is similar to those of other studies that found that pre-service as well as in-service teachers have higher PTE than GTE (e.g., Milson, 2003; Wertheim & Leyser, 2002).

Implications
Although the TES-SK psychometric properties determined from this study were not as strong as might be desired, they are substantive enough to allow initial research use of the instrument. A first step in such research might be further refinement of the TES-SK to address some of its limitations. For example, it should be used to investigate teacher self-efficacy among more tightly controlled and selected samples of pre-service teachers and among practicing teachers. In particular, problems with measurement of GTE remain, a not unusual result in the professional literature. Further, more specific refinement or revision of existing measures of GTE are necessary, as is GTE research with more varied samples and of factors related to GTE.

Data from Slovak pre-service students were similar to comparable samples in other countries. Relatively high level self-efficacy in pre-service teachers is a good in that it should underlie successful teaching after they actually enter the teaching profession. However, further research is needed to determine the educational, personal, social, and/or other factors that contribute to level of teacher self-efficacy. As noted, Bandura postulated four sources of efficacy expectations: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states (Bandura, 1997). These sources in particular should be examined to investigate how they function in and impact pre-service teachers’ self-efficacy. And of special concern is how to design teacher education so that it can successfully impact pre-service teachers’ self-efficacy.

Note: An earlier version of this paper was published in Gavora (2010).
References


Figure 1. The factor structure of TES-SK: item loadings and inter-factor correlation

Table 1. TES-SK overall item descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>mean</th>
<th>minimum</th>
<th>maximum</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTE</td>
<td>4.22</td>
<td>2.33</td>
<td>5.83</td>
<td>0.73</td>
</tr>
<tr>
<td>GTE</td>
<td>3.69</td>
<td>1.50</td>
<td>5.75</td>
<td>0.87</td>
</tr>
</tbody>
</table>
Table 2. TES-SK item means in descending order.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Item Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 When a pupil has difficulty with an assignment, I am usually able to adjust it to his/her level.</td>
<td>PTE 4.86</td>
</tr>
<tr>
<td>2 If a pupil is not disciplined, I am sure I can find ways to manage him/her.</td>
<td>PTE 4.26</td>
</tr>
<tr>
<td>3 If a pupil cannot do a homework assignment, I would be able to assess whether it was at a correct level of difficulty.</td>
<td>PTE 4.15</td>
</tr>
<tr>
<td>4 If a pupil masters a new concept quickly, it might be because I knew the necessary steps in teaching that concept.</td>
<td>PTE 4.10</td>
</tr>
<tr>
<td>5 Hours in class have little influence on pupils compared to the influence of their home environment.</td>
<td>GTE 4.08</td>
</tr>
<tr>
<td>6 If pupils get better grades than they usually get, it is because I found more efficient ways of teaching.</td>
<td>PTE 4.05</td>
</tr>
<tr>
<td>7 A teacher is very limited in what he/she can achieve because it is the home environment that shapes a pupil’s motivation.</td>
<td>GTE 4.04</td>
</tr>
<tr>
<td>8 When the grades of a pupil improve, it is because I found a way how to adjust teaching him/her.</td>
<td>PTE 4.02</td>
</tr>
<tr>
<td>9 Even if the teacher has excellent knowledge and skills, it has little influence on pupils’ learning.</td>
<td>GTE 3.35</td>
</tr>
<tr>
<td>10 The amount a pupil can learn is primarily related to family background.</td>
<td>GTE 3.33</td>
</tr>
</tbody>
</table>

Notes:
For this table, the Slovak version of the items was translated back into English. Negatively worded items (3, 5, 7 and 9) were reverse scored.
PTE - Personal Teaching Efficacy
GTE - General Teaching Efficacy

Table 3. Mean scores on PTE and GTE in five studies of pre-service teachers

<table>
<thead>
<tr>
<th></th>
<th>Slovakia</th>
<th>USA 1</th>
<th>USA 2</th>
<th>Turkey</th>
<th>Israel</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTE</td>
<td>4.22</td>
<td>4.12</td>
<td>4.65</td>
<td>4.25</td>
<td>4.31</td>
</tr>
<tr>
<td>GTE</td>
<td>3.69</td>
<td>3.85</td>
<td>4.19</td>
<td>4.37</td>
<td>3.89</td>
</tr>
</tbody>
</table>

Note:
PTE - Personal Teaching Efficacy
GTE - General Teaching Efficacy
USA 1 – Woolfolk (2000)
USA 2 – Cakiroglu, Cakiroglu, Boone (2005)
Turkey – Cakiroglu, Cakiroglu, Boone (2005)