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Development and Validation of the Standards Self-Efficacy Scale (SSES) for US Pre-service Teachers

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Abstract: *The Standards Self-Efficacy Scale (SSES) was developed to assess 204 pre-service teachers' self-efficacy beliefs to utilize as part of the InTASC professional standards for teachers. Principal component analysis revealed the nuanced factor structure of the SSES to measure standards-based self-efficacy. The SSES was compared to the well-established General Teacher-Efficacy (GTSE) Scale to determine its comparative validity that showed significant correlations with all four factors of GTSE with providing evidence that the SSES effectively measures self-efficacy. Implications for SSES as a valid measure aligned with the InTASC standards allowing for a standards-integrated approach are discussed.*

Keywords: InTASC Standards, Validation, Social cognitive Theory, Teacher-efficacy, Pre-service teachers

Configuring and employing successful programs to prepare pre-service teachers (PSTs) who are capable and assertive to teach is the main responsibility of the initial teacher education program (Abraham, 2021).Initial Teacher education Programs (ITEPs) are developed to achieve initial development of highly effective teachers (Floren et al., 2020; Immekus, 2016), that is, TEPs that produce classroom-ready teachers who can make a difference to all students' learning, thus increasing every student's education attainment level. Teaching is a multifaceted profession that requires understanding of the subject matter and knowledge of effective pedagogy to prepare PSTs according to classroom needs (Darling-Hammond et al., 2002). One component of teacher readiness to teach is theoretically connected to the development of their teaching self-efficacy (Abraham, 2021). (Darling-Hammond, et al., 2002), since self-efficacy is conceptualized as "cognition that mediates knowledge and action" (Raudenbush et al., 1992, p. 150). Crucially, PSTs' sense of self efficacy forms within the early years of teaching and once developed it is resistant to change (Tschannen-Moran et al., 1998). Hence, it is important to develop teacher self-efficacy and its antecedents early on, that is, from their first exposure to the teaching profession

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itself. TEPs provide students a "structure" of professional practice experiences to induct them into the required knowledge, skills and understandings necessary for successful entry into a school and professional community (Shaukat & Raqib, 2021, p. 56).

One means of ascertaining the readiness of PSTs through the adoption of professional standards which provide a focused means of deliberating upon teacher preparedness (Swabey et al., 2010). This study seeks to examine to what extent PSTs initially gain knowledge and understanding of the set standards. Second, it explores the relationship between the efficacy levels of PSTs and their ability to address these teaching standards. The present study is conceptualized on Bandura's Social Cognitive Learning Theory (1997) that explores the best constellation of factors that can be used to validate a measure-based Standards Self-Efficacy Scale to create a new survey of PSTs' self-efficacy in using standards to teach. Development of Standards Self-Efficacy Scale (SSES) measures PSTs' knowledge of their professional competencies that are required to become proficient teachers. This scale is built on the conceptualisation of social cognitive theory that explains personal experiences, environment and behaviours effect on human functioning that is parallel in the training of teacher education programs where PSTs interact with their peers, construct their knowledge, and develop their professional competencies. Hence, SSES is the specific instrument that determines the PSTs' efficacy beliefs to utilize InTASC standards for teach students in the US context.

LITERATURE REVIEW

SIGNIFICANCE OF A STANDARDS-INTEGRATED APPROACH IN TEPS

The need for professional standards has increased in importance because of the call from governments to improve the quality of classroom practice, thus precipitating an increased emphasis on professional competencies for teachers as part of TEPs and courses (Choy et al., 2013; Kriewaldt, 2015; Zionts et al., 2006). Several researchers, notably Sachs (2003), that standards recommend the foundation for the benchmarking of minimum benchmarks of attainment in several characteristics of teaching outlining the requirements as "what teachers should be able to do and what they should know" (p. 177). Likewise, Ingvarson (1998) stressed that standards tend to improve the teaching quality and enhance the status of the teaching profession; further, Tuinamuana (2011) that professional standards provide a direction to shape the professional identity of teachers. Through the implementation of PSTs' standards in the process of professional development, this process may influence their level of professional commitment, classroom enactment and teacher determination to promote change in students' learning.

Teaching PSTs to understand and successfully undertake a reflective process usher in a complexity that needs to be embraced. The intricacy of efficient teaching is defined through the Agenda for Teaching (2013) and InTASC Model Core Teaching Standards and Learning Progressions for Teachers (2013). InTASC was commissioned by the Council of Chief State School Officers (CCSSO) to present model standards for beginning teachers that address the fundamentals of professional knowledge, dispositions, and proficiencies as a resource for discussion. Pre-service teachers first encounter teacher professional standards in their initial Teacher Education Programs. InTASC addresses ten principles that are required to improve the coaching, licensing, assessment, and ongoing capacity building of novice teachers. The ten principles of InTASC standards consist of four categories that reflect the areas of standards in each domain. The first category is 'The Learner & learning category' which particularly emphasizes the learner area (standard (1) learner development, standards (2), learning differences, standard (3),

learning environments). The second category, 'Content' covers (standard (4) content knowledge, standard (5) application of content) while the third category 'Instructional practice' addresses (standard (6) assessment, standard (7), planning for instruction, and standard (8), instructional strategies). The last category 'professional responsibility' presents (standard (9), professional learning and ethical practice and standard (10), leadership and collaboration CCSSO (2013). Each standard category defines diverse performance stages that make it achievable for teachers of varying experience (PSTs to experienced teacher) to refine their successful-teaching practice (Gordon & Kappan 1996).

The InTASC's framwork to producing standards is grounded on an all-inclusive growth of career expansion for teaching professionals. Therefore, it drives not only to define rigorous standards for novice teachers but also lays out the fundamentals of experienced entry-level practice in a way that certifies constancy to align with evolving concepts of proficient teaching. Thus, authorized standards define the goals toward which teachers could work during their careers to attain distinction in their profession. InTASC's performance-based certifying standards specify the underpinning for professional development throughout a teacher's career. InTASC craft essential standards that define crucial features of teaching, irrespective of the topic, grade level, or students being taught. These underlying standards are considered to have two significant features. Primarily, they are performance-based - that is, they define what teachers should know and be able to do from the moment they commence their profession. Subsequently, they are associated directly to existing views of what students should know and be able to do to meet new K-12 standards for learning thought-provoking subject matter (Gordon & Kappan, 1996).

The National Council for Accreditation of Teachers (NCATE) (2008) recommends the anticipated level of attainment of a beginner teacher in the first year of teaching and its transaction is the remit of the teacher education program by which the individual receives certification. Teacher education programs are anticipated to produce highly proficient teachers who reveal effective-teaching competencies in planning and preparation, creating supportive classroom settings, teaching, and understanding their professional responsibilities (Danielson, 2007). Regrettably, new teachers continue to struggle as they are confronted with the steep learning curve characteristic of the early years of teaching (New Teacher Project, 2013). Consequently, many K-12 schools and school districts have mentoring support systems in place to support stressed first-year teachers to amend and adopt the requirements of the classroom (Darling-Hammond, 2020).

As novice teachers struggle in their first years after graduating from a teacher training program, this problem suggests a closer look is required at standards and prospects of teacher education programs and the preparation of competent teachers. In regard to this predicament, many scholars have observed that standards and rigorous programs of study in teacher education programs are lacking across the states (Bleicher, 2007; Hill, 2003). Hill (2003) suggests PSTs' understanding of content is often inadequate to demonstrate the confidence required to teach effectively and in a way that transacts concrete learning outcomes in their students. A program of study needs to provide the essential experiences and opportunities required for PSTs to gain confidence in their capabilities to contribute to the level of student motivation and performance activities as the platform for effective teaching (Bleicher, 2007).According to Brown et al., (2022) proposed PSTs' understanding of content is often inadequate to instill in them the confidence required to teach effectively and in a way that attains constructive and concrete learning outcomes in their students. In considering teacher ability to self-regulate their teaching performance underpinned by a level of confidence to so, Oakes et al. (2013) affirm that, "Teachers' judgments about their capability to plan and perform actions [are] essential to attain an anticipated outcome

that impact their goals, effort, and determination with teaching tasks, which in turn effects their teaching performance" (p. 99).

PRE-SERVICE TEACHERS' SENSE OF TEACHING EFFICACY

One element of teacher development is the beliefs novice teachers hold about their own abilities as teachers. These perceptions and beliefs are sometimes signified to as teacher efficacy. "Teacher efficacy" is precisely a form of self-efficacy and is described as "one's abilities to consolidate and execute the courses of action mandatory to produce given attainments" (Bandura, 1997, p. 3). Teacher efficacy plays a crucial role in shaping the teaching practices and student outcomes, making it a significant focus in the professional growth of novice teachers.

Teacher preparation programs need to provide the essential experiences and opportunities required for PSTs to gain confidence in their capabilities to create the level of motivation and performance activities needed for effective teaching (Bleicher, 2007). This is a challenging process considering the nature of effective teaching. When exploring the nature of effective teaching, it is vital to recognize what makes a teacher effective in the classroom (Thomas & Mucherah, 2016). Teachers who set higher goals than others, are less afraid of failure, persist longer than others when things get difficult are more likely to be effective in the classroom (Swanson et al., 2013; Tschannen-Moran & Woolfolk-Hoy, 2001). Oakes et al., (2013) state, "Teachers' judgments about their capability to plan and perform actions [are]essential to attain an anticipated outcome that impact their goals, effort, and determination with teaching tasks, which in turn effects their teaching performance" (p. 99).

Developing teacher self-efficacy influences a teacher's career-long determination to achieve quality teaching and efficacy. PSTs believe to acquire how to be successful teachers (Temiz & Topcu, 2013). Hence, understanding the level of self-efficacy in effective-teaching knowledge and skills of PSTs is critical to confirming that new teachers will prosper in their practice (Bleicher, 2007). Advanced standards for teachers create an increased, but necessary burden on teacher education programs to train teachers who are capable to positively encounter the prospects of 21st century classrooms. These increased expectations impact how universities prepare PSTs to become active, career-oriented teachers. Research indicates that for PSTs to transition productively to the K-12 system, they must have faith in their ability to influence the lives of their students (Cho et al., 2020). This belief is based upon and encompasses the development of effective teaching knowledge and skills, a realization how knowledge and skills work together, and an appreciation of the influence proficient teaching can have on learners' attainment.

DIVERSE APPROACH OF USING STANDARDS IN DIFFERENT STATES

Akiba et al. (2010) inspected the utilization of areas of professional standards in the 50 states and Washington, DC for the accreditation and certification of TEPs. They found that all US states had their own state-owned body of standards for teacher accreditation. Standards vary from state to state according to their TEPs' demands and program certification, as of 2006, respective states used countrywide standards authorization in addition to their own state-run standards to approve TEPs. Twenty-three states (45% of all states) owned both state standards and National Council for Accreditation of Teacher Education (NCATE) standards (NCATE, 2008). Seventeen states (33%) expended just their state-owned standards for the program endorsement. Michigan, New York, and Virginia employed state-owned standards for instance, NCATE standards, and the Teacher Education Accreditation Council standards (NCATE, 2008). Arkansas and Indiana

retained state standards and national standards established by InTASC (InTASC, 1992). Merely Tennessee used state standards, NCATE standards, and InTASC standards. Five states did not have state standards for program accreditation and employed only national standards. Four states (Nevada, New Mexico, DC, and West Virginia) utilized NCATE standards only, and Utah used both NCATE and TEAC standards.

InTASC, a consortium of state-run education organizations and national educational establishments, is dedicated to the training, licensing, and ongoing professional development of teachers. As it is not a certifying agency, InTASC does not distinguish education preparation programs but does influence states' education preparation program certification policies and teacher certification through its certified standards, Model Standards for Beginning Teacher Licensing, Assessment and Development (InTASC, 1992).The National Council on Teacher Quality (NCTQ) released a report in 2013, Teacher Prep Review, stating 90% of the 1,130 teacher education programs in the research study were preparing teachers who were incapable of meeting the requirements of the classroom in their first year. The findings from this appraisal adjudicated the knowledge and abilities of first year teachers to be insufficient to meet the demands of what was expected of students to achieve at the K-12 levels. NCTQ (2013) recognized three main reasons why teacher education programs were failing: (a) teacher education programs had few defined academic requirements if any, on student admittance, (b) content teaching at the teacher training program level is not undertaken consistently, that is, in accord with the Mutual Essential Standards, and (c) evidence-based reading instructional approaches required to enhance the ratio of talented students are not imparted in teacher training programs.

CURRENT STUDY

The rationale for establishing a scale on pre-service teachers' self-efficacy lies in its potential to inform teacher education practices, improve teacher preparation programs, and contribute to a deeper understanding of the factors that influence teaching effectiveness and retention in the profession. By measuring self-efficacy, it becomes possible to identify areas where PSTs may lack confidence or feel less prepared. This information can then be used to tailor training programs and support mechanisms to address these specific needs. The connection between InTASC standards and PSTs' self-efficacy emphasizes the importance of supporting pre-service teachers in developing confidence in their abilities to meet the expectations prescribed in the standards. This support can enhance their readiness for the classroom and contribute to their effectiveness as future educators. PSTs' self-efficacy beliefs may influence their perceptions of their ability to meet the specific criteria mentioned in the InTASC standards. For instance, a PST with high self-efficacy in classroom management may feel confident in their ability to meet standards related to creating a positive learning environment. InTASC professional standards areas and a general teacher efficacy scale are relevant to assessing and supporting effective teaching, they differ in their focus, specificity, purpose, and application within the field of education.

Hence, SSES was designed to measure PSTs' self-efficacy beliefs in their ability to utilize the InTASC professional standards; these differed markedly from the previous research that has recommended the CAEP and InTASC standards as the basis for evaluating program assessment (Heafner et al., 2014; Wentworth et al., 2008). This departure with its emphasis on program alignment recommends the close inspection of applicants regardless of applicants' insights of their own understandings (Wentworth et al., 2009). The recently updated version of InTASC standards well allied with state and national accreditation standards, so that instruments constructed upon the back of these standards are likely to be more effective in revealing the parameters of

competence as well as providing shared benchmarks for competence (CCSSO, 2013; Darling Hammond, 2002). Another study conducted by Floren et al., 2020 was created to validate the InTASC Candidate Self-Perception Instrument (ICSPI), that was proposed in particular to attain feedback from candidates in regard to how well their educator preparation program (EPP) equipped them to encounter a range of components specified in the InTASC standards. ICSPI mainly addresses the candidates' insights of coaching according to the InTASC standards after the end of a final methods/strategies course and the final practicum (i.e., student teaching) has been completed. Ingersoll and Kinman (2002) created an instrument to measure candidate's insights of competency on the InTASC dimensions. The instrument yields responses to 24 individual capabilities that address teaching skills, classroom management skills, knowledge of children, and technology skills. Analysis of the instrument has produced adequate psychometric properties (Barni, et al., 2019). This instrument reveals, however, a limitation; that is, self-perceived competence is not essentially equal to actual ability. However, researchers suggest the figures from this tool provide useful formative data for ITEPs. Thus, this study examines the effectiveness of the standards-based teacher education program to prepare PSTs for teaching students according to their needs. In particular, this study seeks to act upon new knowledge presented in the literature pertaining to the measure of self-efficacy scale standards by answering the following research questions:

1. To what extent can the underlying standards-based factor structure measure PSTs' self-efficacy as part of a standards approach to teaching?
2. To what extent is there validity for measuring PST's self-efficacy in using standards to teach?
3. What are the self-efficacy levels of PSTs in using standards to teach?

METHODS

A quantitative study with cross-sectional survey methodology was employed at a public university in Nevada to assess the feasibility of using the Standards Self-Efficacy Scale (SSES) as a tool for measuring standards-based instruction. The study involved 204 participants in the teacher preparation program, predominantly female and racially diverse. The SSES, allied with the InTASC Model Core Teaching Standards, consisted of 29 questions across 9 InTASC Standards. Additionally, the General Teacher Self-Efficacy Scale (GTSE) was utilised to measure concurrent validity. The analysis included confirmatory factor analysis, Pearson correlations, and regression analysis using the JASP interface of the R software suite.

PARTICIPANTS

The SSES was administered to PSTs at a diverse public university located in Nevada, Southwestern United States. The survey responses were collected online from participants at various points in their teacher education program enrolled in the Fall semester, 2022 and Spring semester, 2022. The total number of participants was N = 204. As shown in Table 1, participants were largely female (74%), but racially diverse. The institution had both undergraduate and post baccalaureate degree programs in secondary and elementary teacher preparation.

Table 1
Participants' Demographic Characteristics of the study

Demographics	Percent of Participants
Gender	
Male	22.5
Female	74.0
Non-binary/Transgender	7.0
Race/Ethnicity	
African American	5.6
Asian American	18.3
Hispanic American	28.4
Native American	6.6
Caucasian American	40.1
First generation college student	58.1
Preparation Program	
Elementary Education	52.5
Secondary Education	47.5
Undergraduate	89.6
Post Baccalaureate	10.4

MEASURES

STANDARDS SELF-EFFICACY SCALE (SSES)

The SSES was designed to align with the InTASC Model Core Teaching Standards and was designed to measure the PSTs self-efficacy beliefs to utilize in conjunction with the InTASC professional standards. Participants responded to statements that began, "I can…" or "I understand" on a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. As shown in Table 2, the SSES consisted of 29 questions distributed across 9 InTASC Standards. In this study researchers considered 9 areas of InTASC standards from the original 10 standards.

Table 2
Distribution of Questions by InTASC Standard and PCA

InTASC Standard	Number of Survey Questions- α	PCA Rearrangement of Questions (%explained) - α
1. Learner Development	3 - .47	3 (3.16) - .62
2. Learning Differences	3 - .76	4 (3.68) - .79
3. Learning Environments	3 - .68	4 (4.36) - .76
4. Content Knowledge	4 - .71	3 (2.98) - .69
5. Application of Content	4 - .70	3 (2.92) - .70
6. Assessment	3 - .73	3 (36.15) - .72
7. Instructional Strategies	3 - .67	3 (3.47) - .74
8. Professional Learning and Ethical Practice	3 - .71	3 (6.46) - .71
9. Leadership and Collaboration	3 - .74	3 (5.05) - .72

General Teachers' Self-Efficacy

The General Teacher Self-Efficacy Scale (GTSE: Tschannen-Moran & Hoy, 2001) was used to provide additional information about participants and to provide a measure of concurrent validity. The original GTSE has been used by a large number of researchers. It consists of three factors that are self-efficacy in instruction, classroom management, and student engagement, each consisting of four questions. In the 2018 administration of the Teaching and Learning International Survey (Ainley & Carstens, 2018), an additional five questions were added addressing self-efficacy in diverse classrooms. Participants responded to all 17 questions on a four-point scale where 1 = "Not at all", 2 = "To some extent", 3 = "Quite a bit", 4 = "A lot".

Table 4

SSES Question and Survey Descriptive Statistics

SSES Question	Min	Max	Mean	*SD*
1. I understand each learner's developmental patterns (cognitive, linguistic, social, emotional, and physical) and use that knowledge to make a difference in students' learning.	1.00	5.00	4.11	.80
2. I can modify instruction according to students' diverse backgrounds by keeping in mind their language and culture to make it equally successful for all.	3.00	5.00	4.38	.57
3. I can initiate meetings with parents, peers, and other professionals to understand each learner's learning difficulties.	2.00	5.00	4.21	.78
4. I can identify all learners' potential and can design instruction according to their strengths.	2.00	5.00	4.31	.66
5. I understand students' exceptional needs (disabilities, giftedness) and can employ teaching strategies and resources to address their needs.	2.00	5.00	4.29	.69
6. I can utilize resources to meet particular learners' needs.	3.00	5.00	4.34	.61
7. I can devise motivational strategies to redirect the attention of learners who show low motivation in studies	2.00	5.00	4.19	.74
8. I can help learners to work productively and cooperatively with each other to achieve learning goals.	2.00	5.00	4.28	.66
9. I can create a safe and productive learning environment for all the learners' active participation in the class.	2.00	5.00	4.46	.61
10. I can integrate probing questions to challenge students' thinking.	2.00	5.00	4.33	.68
11. I can avoid using misconceptions in my subject matter and can help students to develop their accurate conceptual understanding of the content.	2.00	5.00	4.32	.65
12. I can assimilate culturally relevant content into my instruction.	2.00	5.00	4.31	.67
13. I can keep myself up to date with the new information and content standards in my field.	2.00	5.00	4.27	.65
14. I can present content by integrating critical thinking and problem-solving tasks to promote students' higher order thinking skills.	2.00	5.00	4.31	.61
15. I can use digital and interactive technologies for successfully achieving the learning outcomes.	1.00	5.00	4.42	.63

16. I can employ teaching strategies that help students to become independent learners.	2.00	5.00	4.29	.66
17. I can guide my students to understand local and global issues.	2.00	5.00	4.24	.72
18. I can use a variety of assessment techniques to understand students' learning performance.	2.00	5.00	4.39	.61
19. I can provide feedback to students to help them identify their learning gaps.	2.00	5.00	4.31	.64
20. I can use different strategies to communicate meaningful feedback to students.	2.00	5.00	4.37	.62
21. I can teach students about multiple forms of communication (oral, written, nonverbal, digital, visual) to convey ideas	1.00	5.00	4.44	.63
22. I can utilize a wide variety of resources, to engage students in learning.	2.00	5.00	4.41	.64
23. I can lead discussions that serve different purposes (e.g., probing for learner understanding, helping learners articulate their ideas and thinking processes and stimulating curiosity.	2.00	5.00	4.25	.71
24. I can build strong professional relationships with my colleagues from diverse backgrounds.	2.00	5.00	4.39	.66
25. I can use self-assessment strategies to reflect on my teaching and to plan to adjust my instruction according to learners' needs.	2.00	5.00	4.42	.58
26. I can plan for my professional growth through my professional network.	1.00	5.00	4.18	.75
27. I can take initiative to grow and develop with colleagues through interactions that enhance practice and support student learning.	2.00	5.00	4.29	.67
28. I can take responsibility for contributing to and advancing the teaching profession.	1.00	5.00	4.35	.72
29. I can seek appropriate opportunities to model effective practice for colleagues, to lead professional learning activities, and to serve in other leadership roles	2.00	5.00	4.24	.76
SSES Combined	3.21	5.00	4.31	.40

ANALYSIS

We began the analysis by examining the underlying factor structure of the SSES through both confirmatory factor analysis (CFA) and component principal analysis. Next, we examined the concurrent validity of the SSES by conducting Pearson correlations between the SSES and all four factors of the GTSE. We also conducted a regression analysis (Pedhazur, 1997) with participant demographic variables (see Table 1). Finally, we conducted descriptive statistics to understand PSTs' self-efficacy in using the standard s for teaching. All analysis was conducted using the JASP interface of the R software suite (JASP Team, 2022).

RESULTS

Analysis started with a principal component analysis (PCA) investigating the underlying factor structure of the InTASC standards (see Table 2) constrained to nine components and through oblique rotation. However, the data did not fit perfectly as described by the InTASC standards-

based factor structure in addressing research question 1. The results still maintained the standards-based factor structure (i.e., the nine defined standards) but rearranged a few items toward standards 2 and 3 rather than on standard 4 and 5 as described in Table 2. The factorability of the nine-standard factor model was within acceptable limits such as KMO = .918 (< .60) and χ^2 with $p <$ .001 (Bartlett's test of sphericity). The total explained variance for the standards-based model was 68.23% with six factors having an eigenvalue greater than 1. The lowest factor or component (Application of Content) explained 2.92% of the variance, which is observed in Table 2. Cronbach's alpha for internal consistency was also sufficiently high (α = .94) across question items. Additional reliability estimates at each standard-level are presented in Table 2 to illustrate item rearrangement improvements for internal consistency. Although items were rearranged the assigned items were still aligned to their standards-based factor measure.

Correlation analysis was used to provide some evidence of concurrent validity with a measure of general teacher self-efficacy. The scores of the analysis can be seen in Table 3. The SSES had positive, significant correlations with all four factors of general self-efficacy with values ranging from $r = .629$ to $r = 522$. These moderate correlations provide evidence that the SSES is effectively measuring self-efficacy while providing data that differs from general self-efficacy as measure by the GTSE, which contributes to addressing research question 2.

We next conducted a regression analysis to understand if participant demographic characteristics (see Table 1) were predictive of SSES. The regression analysis showed no statistically significant associations among the demographic variables and the SSES. Likewise, the model was not significant.

Table 3

Pearson Correlations between SSES and GTSE

	SSES	GTSE Instruction	GTSE Engagement	GTSE Management	GTSE Diverse
SSES	—				
GTSE Instruction	0.537*	—			
GTSE Engagement	0.553*	0.557*	—		
GTSE Management	0.522*	0.502*	0.647*	—	
GTSE Diverse	0.629*	0.504*	0.511*	0.356*	—

Note. *$p < .001$.

In addressing research question 3, descriptive statistics were used to calculate PSTs' self-efficacy to use standards in teaching and can be seen in Table 4. The overall mean score for the SSES was $M = 4.31$ with a standard deviation = .40. The highest self-efficacy was in creating a safe and productive learning environment ($M = 4.46$, $SD = .61$) while the lowest area understanding learners' developmental patterns ($M = 4.11$, $SD = .80$).

DISCUSSION

The study aimed to investigate the feasibility of the Standards Self-Efficacy Scale (SSES) as a tool to measure pre-service teachers' (PSTs) efficacy in utilizing the InTASC professional

standards. The psychometric properties of the SSES were evaluated to determine its validity and reliability. The findings describe the 29-item SSES as demonstrating sound validity and reliability, although further item-level improvement was suggested to enhance internal consistency among the questions (e.g., see Learner Development in Table 2). The scale demonstrated high internal consistency at the unidimensional level attesting to a broad standards-based measure for self-efficacy. However, the self-efficacy literature and the 9 areas of InTASC standards support a multidimensional structure for assessing a standards-based measure for self-efficacy.

If the nine constructs measured by the SSES aligned well with the four factors of the GTSE, one could expect moderate to strong positive correlations between corresponding factors that assess similar aspects of teaching self-efficacy. For instance, if an SSES factor on instructional practice aligns closely with the GTSE factor on instruction, a strong positive correlation might be anticipated. However, if the SSES factors are more specific or distinct from the broader GTSE factors, the correlations may be weaker or less interpretable. The SSES, with its alignment to the InTASC standards, may delve into more nuanced aspects of teaching that are not captured by the GTSE's broader factors, resulting in weaker correlations.

In this context, a correlation matrix (See Table 3) between the SSES factors and the GTSE factors could potentially provide valuable insights. Through the correlation matrix the relationships between the two scales illustrate moderate to strong correlations (.3 to .5 = moderate, .5 to .7 = strong correlation). Specifically, relationships between SSES and GTSE for instruction = .54, engagement = .55, and management = .52, while Diverse = .63. The strength of the relationships (*r*) between SSES and GTSE is positively closely aligned to factors and still illustrated more nuanced aspects of teaching not covered by GTSE since correlations were not strongly positive.

PSYCHOMETRIC PROPERTIES OF THE STANDARDS SELF-EFFICACY SCALE

This study intended to construct and validate the SSES to measure PSTs' efficacy to utilize InTASC professional standards for strengthening their professional practice in the process of becoming an effective teacher. The psychometric features of the SSES were determined through content and construct validity evidenced by the extensive literature review, conceptual supports such as the procedures for developing self-efficacy instruments (Bandura, 2001), and the best practices in scale development research (Worthington & Whittaker, 2006). The results of this study suggested the 29 items can be used to inform the nine standards-based factors of the Standards Self-efficacy Scale with some item rearrangement. The 29-item SSES had sound legitimacy and consistency evidence but could use further item-level improvement to increase internal consistency among questions. As Akkus (2020) reports, a good scale should exhibit unidimensionality through factor analysis, which the SSES demonstrated by considering a single factor construction with high internal consistency ($\alpha = .94$), validating its use for a single standard-based measure of self-efficacy. However, we go further in justifying the potential use of the SSES as a nine-standards based factor structure.

Assessing self-efficacy beliefs of pre-service teachers (PSTs) is a crucial aspect of teacher education programs. While the General Teacher Self-Efficacy (GTSE) scale has been widely utilized for this purpose, the recently developed Standards Self-Efficacy Scale (SSES) offers potential advantages. The SSES was designed to align with the InTASC (Interstate Teacher Assessment and Support Consortium) Model Core Teaching Standards, ensuring a direct measurement of PSTs' self-efficacy beliefs in relation to the professional standards they are expected to meet. This alignment allows for a more targeted and relevant assessment of PSTs' preparedness for the teaching profession.

Furthermore, the SSES comprehensively covers 9 out of the 10 InTASC standards, spanning various teaching domains such as instructional practice, student assessment, classroom management, and professional responsibilities. This comprehensive coverage enables a holistic evaluation of PSTs' self-efficacy across multiple facets of teaching, providing a well-rounded understanding of their strengths and areas for growth. Moreover, by assessing self-efficacy across multiple teaching standards, the SSES can potentially identify specific areas where PSTs may need additional support or intervention. This targeted approach could be more effective than relying on a general self-efficacy measure like the GTSE, as it allows for tailored feedback and targeted interventions to address individual needs.

Notably, the SSES items are contextualized to the teaching profession, with statements beginning with phrases like "I can..." or "I understand..." This contextualization resonates better with PSTs, as it directly relates to their future roles as educators, potentially providing a more accurate assessment of their self-efficacy beliefs specific to the teaching context. By framing the items in this contextualized manner, the SSES has the potential to provide a more accurate assessment of PSTs' self-efficacy beliefs specific to the real-world teaching context they will soon encounter.

While the GTSE is a well-established and widely used scale, it may not capture the nuances and specific domains of teaching as comprehensively as the SSES. The SSES's alignment with professional teaching standards and its contextualized items could provide a more accurate and actionable assessment of PSTs' self-efficacy beliefs related to their future teaching practice. This, in turn, would ultimately contribute to their professional development and preparedness for the classroom (Willis et al., 2021).

IMPLICATIONS FOR PRACTITIONERS

This study encompassed augmented consistency in teaching and professional standards to better prepare K-12 students and career-readiness. This study provides implications for considering the standards integrated approach into teacher education programs to prepare PSTs' according to classroom needs. Since this study aimed to develop a standards self-efficacy scale in tandem with the utilizing of InTASC standards that are commonly recognized and often viewed as the source for building/structuring educator preparation program in the USA (Henson, 2009). The integration of standards including the self-efficacy scale with the curriculum scheme of studies in ITEPs can contribute a substantial role in determining that the application of the standards progresses the reform agenda beyond "window dressing" to an agenda where genuine reform of classroom practice is promulgated. The study results reinforce the need for integrating the professional standards for teachers into teacher content in Nevada and further, ensuring that the implementation process in classrooms occurs.

Development of a survey to measure PSTs' self-efficacy to utilize InTASC standards was indispensable in determining the means by which this tool could be employed in conjunction with other measures such as those pertaining to professional dispositions and competencies to monitor students' professional knowledge and practice that are required in order to meet the classroom learning needs. The current study's findings offer direct suggestions for TEPs to employ the SSES instrument to gather data in support of accreditation and program assessment by determining PSTs' efficacy beliefs to use InTASC standards. The SSES is a scale that can be used by university teachers to determine the self-efficacy of PSTs from diverse backgrounds, male versus female students, and in the critique of different teacher education programs that purport to prepare students with promising teaching interventions. Expanding diverse populations' understanding of standards

self-efficacy will permit educators to tailor educational practices in an effort to enhance students' professional knowledge, dispositions and skills (Rowbotham & Schmitz, 2013).

This study provides a framework about SSES in the form of a nine-standards based factor instrument measuring InTASC standards self-efficacy beliefs of PSTs that can be generalized through the study of large samples of teaching students in other states of the America. To revamp teacher education programs on a national level in the US is a complex task, where education policy is not set by a particular central authority. Instead, this authority is comprised of 50 distinct state schemes and additional state jurisdictions and by local school regions. In many cases, the bodies that provide the legal basis for teacher education are separate from the organizations accountable for teacher certification. With authority for teacher education so regionalized, comprehensive, systematic transformation can be accomplished only by means of a merging concept, allowing for diverse pathways to achieve that common dream. A shared vision is essential to certify the compatibility of methods taken by diverse state establishments to increase student success and to offer stable a route at each point in the career development of a teacher. A broadly renowned set of standards for the enactment of teaching experts can reify desirable reliability and compatibility. The InTASC includes government departments of education and self-governing standards boards accountable for teacher training and licensing. Considering the significance of the above-mentioned standards, SSES provides a comprehensive picture of the different dimensions of the standards that measure PSTs' self-efficacy to use the standards for becoming an effective teacher.

LIMITATIONS OF THE STUDY

The theoretical contribution of the research is acknowledged to be context-specific, which may limit its generalizability, particularly for international readers. This implies the findings and implications of the study may be highly dependent on the specific context in which the research was conducted and may not be directly applicable to settings with different standards or conditions. Thus, the concern about limited external validity is valid, given the context-specific nature of the theoretical contribution.

However, the SSES scale could be used by teacher education specialists to explore the efficacy of their programs in promoting their students' sense of preparedness across various magnitudes of teaching. In America, ITEPs have specialized experiences at several points through their programs. The purpose of the SSES measure is perhaps best fulfilled when it is employed during the finishing professional placement before graduation. Although variations of this instrument were available under InTASC teaching standard for American teachers, they include extensive components of quality initial teacher education, hence the instrument can be used in international contexts as well. Caution should be pertained in rendering the results as this tool does not measure the attribute of the programs neither specifies an precise measure of the potential for teacher candidates to become excellent teachers in the future. Rather, it reveals the perceived preparation of beginning teachers, which has been found to be significantly associated with their sense of teaching efficacy (Darling-Hammond et al., 2002). The SSES provides data which can be employed to review TEPs practices, advance and review program entry characteristics and requirements, align courses with standards-integrated approaches, and support TEPs coordinators and supervisors in recognizing the strengths and limitations of their licensure programs.

CONCLUSION

This study can make a significant contribution to the teacher education literature. Such an examination can identify any change in PSTs' opinions on the comparative implication of

Standards on their classroom willingness beforehand and afterward their professional practice. This judgement can also determine whether the professed levels of preparation, involvements and teaching efficacy fall or rise when PSTs meet the challenges of reality and, if so, the details pertaining to such differences. This information may contribute significantly to future guidelines for the construction of highly effective teacher education programs.

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