SELF-EFFICACY SCALE FOR SCHOOL STUDENTS.

Abstract:

Self-efficacy refers to an individual's belief in his or her capability to organise and execute actions required to accomplish specific goals. In educational settings, self-efficacy plays an important role in students' academic motivation, engagement, persistence, confidence, and responses to challenging learning situations. The present study aimed to develop and psychometrically standardise the Roy Self-Efficacy Scale for School Students. A comprehensive review of theoretical and empirical literature was undertaken to conceptualise the construct and identify its relevant dimensions. Four dimensions were identified: Mastery Experiences, Vicarious Experiences, Verbal Persuasion, and Emotional and Physiological States. An initial pool of items comprising both positively and negatively worded statements was generated, followed by expert evaluation by four university-level experts for content relevance, clarity, and appropriateness. Pilot testing was subsequently conducted with Grade XI students. Test-retest reliability was assessed over a 17-day interval using Pearson's Product-Moment correlation, yielding a coefficient of r = .791. Internal consistency was examined using Cronbach's alpha, which produced a coefficient of α = .861. Item analysis using the *t*-test resulted in the retention of 28 items and rejection of four items on the basis of discriminatory power. The final scale employs a five-point Likert-type response format, with total scores ranging from 28 to 140. Established norms classify students into low, moderate, and high levels of self-efficacy. The findings provide satisfactory preliminary evidence regarding the reliability and psychometric usefulness of the Roy and Sarkar Self-Efficacy Scale for School Students.

Keywords: Self-Efficacy, Scale Development, Scale Standardisation, School Students, Reliability, Psychometric Properties

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Introduction

Self-efficacy is a central psychological construct within social cognitive theory and refers to individuals' beliefs regarding their capability to organise and execute the courses of action required to attain designated goals. Bandura (1977) conceptualised self-efficacy as a belief system that influences individuals' choices, effort, persistence, emotional reactions, and patterns of behaviour. Unlike objective measures of knowledge or ability, self-efficacy

concerns individuals' perceptions of what they believe they can accomplish under particular circumstances. These beliefs consequently play an important role in determining whether individuals initiate a task, how much effort they invest, and how persistently they continue when confronted with obstacles or setbacks (Bandura, 1977; Bandura, 1997; Pajares, 1996).In educational settings, self-efficacy has considerable significance because students' beliefs about their academic capabilities are closely associated with their motivation, learning behaviour, effort, persistence, and academic performance. Students who possess stronger academic self-efficacy are generally more willing to select challenging tasks, invest greater effort, employ effective learning strategies, and persist when difficulties arise. Conversely, students with weaker efficacy beliefs may avoid challenging activities, reduce their effort, or experience greater uncertainty regarding their ability to succeed. Research in academic settings has demonstrated that self-efficacy is meaningfully associated with students' motivation and academic outcomes, while systematic evidence also indicates a positive relationship between academic self-efficacy and academic performance (Pajares, 1996; Zimmerman, 2000; Honicke& Broadbent, 2016).Bandura's social cognitive theory identifies four principal sources of self-efficacy information: mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Mastery experiences develop from individuals' own experiences of success and failure and are generally regarded as a particularly influential source of efficacy beliefs. Vicarious experiences arise through observing the performance of others, particularly individuals perceived as similar to oneself. Verbal persuasion involves encouragement, feedback, and evaluative information received from teachers, parents, peers, and other significant individuals, whereas physiological and affective states involve the interpretation of emotional and bodily conditions such as anxiety, stress, excitement, and fatigue. Research in school contexts confirms the relevance of these four sources while also indicating that their relative influence may vary according to academic domain and contextual characteristics (Bandura, 1977; Bandura, 1997; Usher & Pajares, 2008).

The multidimensional nature of self-efficacy has important implications for its measurement. Self-efficacy beliefs are not necessarily generalised across all situations; rather, they are often task- and domain-specific. Consequently, an appropriate self-efficacy instrument should correspond closely to the activities and capabilities that are relevant to the target population. In the case of school students, scale items should be developmentally appropriate, linguistically clear, contextually meaningful, and representative of students' actual academic

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experiences. Previous research has emphasised the importance of specificity and correspondence in the measurement of academic self-efficacy, suggesting that measures closely aligned with particular academic tasks may provide stronger explanatory and predictive value than overly general measures (Pajares, 1996; Pajares & Johnson, 1996; Usher & Pajares, 2008).

The present study was undertaken to develop and psychometrically standardise the **Self**-Efficacy Scale for School Students. The development process was grounded in the theoretical conceptualisation of self-efficacy and involved identification of relevant dimensions, generation of an initial item pool, expert evaluation, preliminary pilot testing, test-retest reliability assessment, item analysis, and examination of internal consistency. The scale was designed to assess self-efficacy through four theoretically relevant dimensions: Mastery Experiences, Vicarious Experiences, Verbal Persuasion, and Emotional and Physiological States. The source study reports that the development process included expert evaluation by four university-level experts and subsequent empirical examination of the items with school students. The emphasis on a population-specific instrument is consistent with recommendations that self-efficacy measures should be appropriately matched to the characteristics and experiences of the intended population (Bandura, 2006; Pajares, 1996; Usher & Pajares, 2008).

Development and Standardisation of the Self-Efficacy Scale

The development of the Self-Efficacy Scale followed a systematic, theory-informed, and empirically oriented procedure designed to ensure adequate representation of the construct and appropriate measurement among school students. Scale development involved conceptualisation of self-efficacy, identification of theoretically relevant dimensions, generation of an initial item pool, expert evaluation, pilot testing, empirical item analysis, reliability assessment, and establishment of norms. The theoretical foundation of the scale was derived primarily from Bandura's conceptualisation of self-efficacy, which emphasises individuals' beliefs regarding their capabilities to organise and execute actions required to attain desired outcomes (Bandura, 1977). Subsequent educational research has demonstrated the importance of considering both theoretical and contextual factors when assessing the sources of students' self-efficacy beliefs (Britner & Pajares, 2006; Usher & Pajares, 2008).

1. Identification of the Dimensions of Self-Efficacy: A comprehensive review of theoretical and empirical literature was undertaken to identify dimensions relevant to the assessment of

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self-efficacy among school students. The conceptualisation of the present scale was particularly informed by Bandura's social cognitive perspective, according to which efficacy beliefs develop through the cognitive interpretation of different sources of efficacy-relevant information. Research conducted in educational contexts has subsequently provided considerable support for examining these sources when attempting to understand how students form beliefs about their academic capabilities (Bandura, 1977; Britner & Pajares, 2006; Usher & Pajares, 2008).Based on the theoretical framework and the requirements of the target population, four dimensions were identified for the present scale: **Mastery Experiences, Vicarious Experiences, Verbal Persuasion, and Emotional and Physiological States**. These dimensions correspond to the four major sources through which efficacy beliefs are theorised to develop and change. Educational research indicates that all four sources can contribute to students' self-efficacy beliefs, although their relative influence may vary according to academic domain, ability, gender, and other contextual characteristics (Bandura, 1977; Britner & Pajares, 2006; Usher & Pajares, 2008).

i) Mastery Experiences: Mastery experience is generally regarded as a particularly influential source of self-efficacy because it is grounded in individuals' direct experiences of performing and completing tasks (Bandura, 1977; Britner & Pajares, 2006; Usher & Pajares, 2008).Empirical research in educational settings provides support for the importance of mastery experiences. Britner and Pajares (2006), in their investigation of middle-school students' science self-efficacy, found significant relationships between the theoretically proposed sources and self-efficacy, with mastery experiences emerging as the significant predictor in their model. Similarly, Usher and Pajares (2008), in their critical review of research on sources of school self-efficacy, concluded that mastery experience is typically the most influential source, although its strength may vary across populations and academic contexts.

ii) Vicarious Experiences: Vicarious experiences refer to efficacy information acquired through observing other people perform particular tasks. Students frequently evaluate their own capabilities partly by comparing themselves with peers, classmates, older students, or other individuals whom they regard as relevant models. (Bandura, 1977; Britner & Pajares, 2006; Usher & Pajares, 2008).Vicarious experiences are particularly relevant in educational environments because students regularly observe the academic behaviour and performance of classmates and other learners. Such observations can provide information about effective strategies, appropriate levels of effort, and the possibility of successfully completing

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academic tasks. Nevertheless, research suggests that the influence of vicarious experiences is context dependent and may not be as consistently strong as that of mastery experiences (Britner & Pajares, 2006; Usher & Pajares, 2008).

iii) Verbal Persuasion: Verbal persuasion refers to efficacy-related information communicated through encouragement, feedback, advice, praise, evaluation, and other forms of interpersonal communication. Students receive such information from parents, teachers, classmates, peers, and other significant individuals. Positive persuasion may encourage students to believe that they possess the capability required to perform a task, particularly when the encouragement is realistic and supported by opportunities for successful performance. Conversely, discouraging messages or repeated negative evaluations may contribute to doubts regarding personal capability (Bandura, 1977; Britner & Pajares, 2006; Usher & Pajares, 2008).Verbal persuasion generally operates alongside other sources of efficacy information rather than independently, and its influence can vary according to the credibility of the source, the nature of the message, and the student's previous experiences (Britner & Pajares, 2006; Usher & Pajares, 2008).

iv) Emotional and Physiological States: Emotional and physiological states constitute another important source of information from which individuals judge their capabilities. Students may interpret anxiety, nervousness, stress, mental pressure, fatigue, excitement, or other affective and physiological reactions as indicators of their ability or inability to manage a particular academic situation. Strong negative emotional arousal can sometimes contribute to lower perceptions of capability, whereas positive emotional states may facilitate confidence and concentration. Importantly, it is not merely the existence of an emotional or physiological reaction but the individual's interpretation of that reaction that contributes to efficacy judgements (Bandura, 1977; Britner & Pajares, 2006; Usher & Pajares, 2008).Research on school-based self-efficacy consequently recognises physiological and affective states as an important component of the broader process through which students construct beliefs regarding their capabilities (Britner & Pajares, 2006; Usher & Pajares, 2008).This multidimensional conceptualisation is consistent with Bandura's theoretical framework and subsequent educational research examining the sources of students' efficacy beliefs (Bandura, 1977; Britner & Pajares, 2006; Usher & Pajares, 2008).

2. Generation of the Initial Item Pool

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For the present Self-Efficacy Scale, **56 items** were initially formulated, with **14 items assigned to each of the four dimensions**: Mastery Experiences, Vicarious Experiences, Verbal Persuasion, and Emotional and Physiological States. The inclusion of an equal number of items under each dimension was intended to provide balanced initial coverage of the proposed construct and to allow subsequent empirical procedures to determine which items demonstrated satisfactory psychometric characteristics. The source document explicitly reports the development of 56 items, comprising both positively and negatively worded statements, with 14 items under each dimension.

3. Expert Evaluation of the Items

The initial item pool was submitted to **four experts from universities in West Bengal** for systematic evaluation. The experts were requested to examine the relevance, clarity, appropriateness, and representativeness of the items in relation to the proposed dimensions of self-efficacy. Expert judgement constitutes an important source of evidence during the early stages of scale development because specialists can assess whether individual items adequately correspond to the conceptual definition of the construct and whether the content is appropriate for the intended population (DeVellis & Thorpe, 2021; Boateng et al., 2018; Haynes et al., 1995).The experts considered the construct validity of the proposed tool to be satisfactory. On the basis of their recommendations, several items were eliminated and other items were revised to improve their conceptual and linguistic appropriateness. The source document reports that **12 items were revised and 12 items were removed**, resulting in **32 items** being retained for subsequent empirical examination. This process helped ensure that the retained items were more closely aligned with the intended dimensions before the scale was administered to a larger sample.

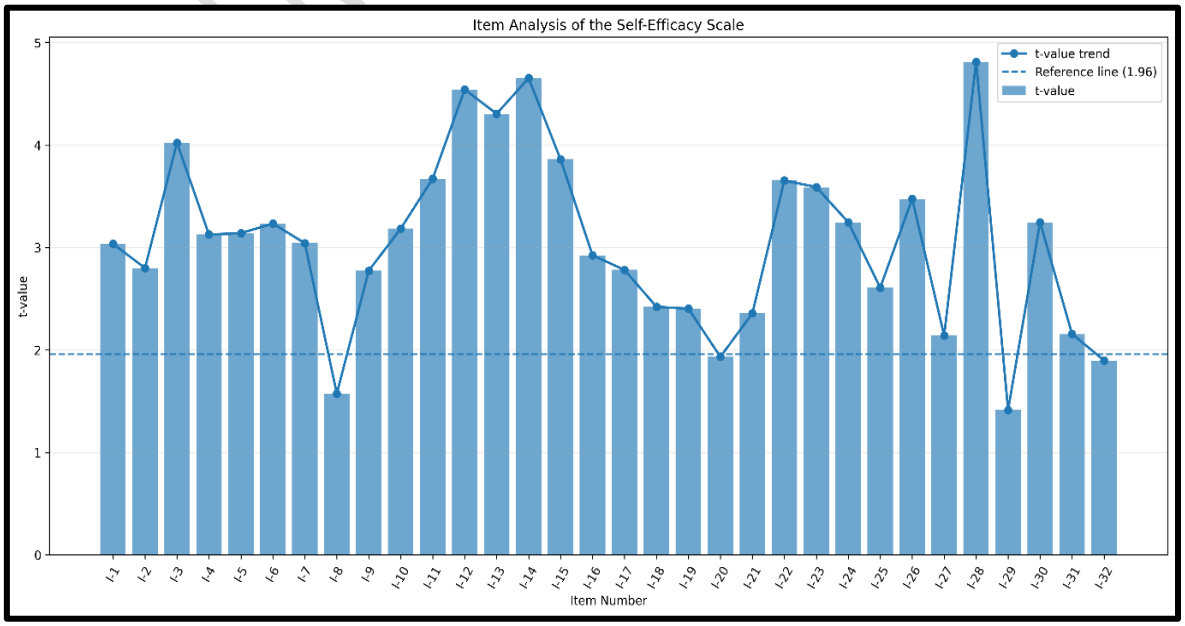
4. Pilot Test I: Assessment of Item Clarity: Following expert evaluation, a preliminary pilot test was conducted with **four Grade XI students**. The principal purpose of this initial pilot test was to examine whether the items were understandable, linguistically appropriate, and suitable for the developmental level of the intended respondents. At this stage, the emphasis was placed on identifying possible difficulties in wording, interpretation, terminology, and comprehension rather than on conducting formal statistical validation.During the preliminary administration, it was observed that some students experienced difficulty understanding the wording of particular items. On the basis of the students' feedback, the language of **three items was revised** to improve clarity and comprehension while preserving their intended

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conceptual meaning. This process helped to ensure that the items would be interpreted in a manner consistent with the construct intended by the researcher.

5. Pilot Test II: Test-Retest Reliability: Following the refinement of the items, the revised Self-Efficacy Scale was administered to **120 Grade XI students**. The same scale was subsequently re-administered to the same group after an interval of **17 days**. The purpose of this procedure was to examine the temporal stability of the instrument by determining whether respondents obtained reasonably consistent scores across two administrations separated by a defined time interval. The source document confirms the use of 120 Grade XI students and a 17-day interval for the test-retest procedure.The relationship between scores obtained during the first and second administrations was examined using the **Pearson Product-Moment correlation coefficient**. The obtained test-retest reliability coefficient was:**Test-Retest Reliability:** The coefficient of ***r* = 0.791**provides evidence of satisfactory temporal stability for the scale within the conditions of the present study.

6. Item Selection and Item Analysis: Items producing statistically significant *t* values were considered capable of differentiating between students with relatively higher and lower levels of self-efficacy and were therefore retained. Items yielding nonsignificant *t* values were considered insufficiently discriminatory and were rejected. The source document reports that the item-analysis procedure was applied after the revised items had been administered to students and that the final selection was based on the discriminatory characteristics of the items.The item-analysis results indicated that **four items were rejected** because their *t* values were nonsignificant:



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The remaining **28 items were retained** because they demonstrated significant discriminatory power. The source document specifically identifies Items 8, 20, 29, and 32 as nonsignificant and reports their respective *t* values.

7. Scoring Procedure: The Roy and Sarkar Self-Efficacy Scale for School Students employs a **five-point Likert-type response format**. The response categories are designed to indicate the degree to which students agree or disagree with each statement. Likert-type scaling is widely used in psychological and educational measurement because it permits the assessment of respondents' attitudes, perceptions, beliefs, and psychological characteristics through ordered response categories (Likert, 1932; DeVellis & Thorpe, 2021).For **positively worded items**, the scoring procedure is as follows:Strongly Agree=5, Agree =4, Neutral=3, Disagree =2, Strongly Disagree = 1

For **negatively worded items**, reverse scoring is applied so that a higher numerical score consistently represents a higher level of self-efficacy:Strongly Agree=1, Agree =2, Neutral=3, Disagree =4, Strongly Disagree = 5

Dimension-Wise Final Items of the Self-Efficacy Scale

Following expert evaluation, preliminary pilot testing, test-retest assessment, and empirical item analysis, the Self-Efficacy Scale was reduced to a final set of 28 items, distributed equally across four theoretically identified dimensions: Mastery Experiences, Vicarious Experiences, Verbal Persuasion, and Emotional and Physiological States. The four-dimensional structure corresponds to Bandura's theoretical formulation of the principal sources through which individuals develop and modify their self-efficacy beliefs.

Dimension 1: Mastery Experiences or Performance Outcomes: The present dimension focuses specifically on students' perceived capability to perform academic tasks, prepare for examinations, understand and retain information, and manage their study time. The seven final items retained under this dimension are:

1. I can write responses to essay questions effectively.
2. I can score well on short-answer questions.
3. I can quickly extract key points from what I read.
4. I can be well-prepared during exam times.
5. I am confident that I will perform well in exams.

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6. I can remember everything even with a short reading.
7. I can find time to study amidst various tasks.

Dimension 2: Vicarious Experiences or Watching Other People Perform: The present dimension therefore incorporates students' experiences of observing academically successful individuals, seeking assistance from others, learning through social comparison, and attempting to improve their own performance based on what they observe. The seven final items are:

1. I set my educational goals by observing others.
2. When faced with difficult questions, I seek assistance from others such as teachers, friends, or parents.
3. When faced with difficult questions, I seek assistance from others such as teachers, friends, or parents.
4. I seek help from friends to find the necessary information for my studies.
5. I can complete homework without relying on guidebooks.
6. I strive to perform better after seeing good results from older individuals.
7. I try to improve my academic performance by observing others who excel in their studies.

The source document presents these seven statements under the dimension of Vicarious Experiences or Watching Other People Perform.

Dimension 3: Verbal Persuasion or Encouragement and Discouragement: The present dimension assesses students' perceptions of encouragement, academic recognition, social support, and their perceived ability to organise and solve academic problems. The seven final items are:

1. I derive enthusiasm for studying from my parents.
2. I have received praise from many for my study.
3. My classmates want to collaborate with me because they think I excel in academic work.
4. Due to family issues, I am unable to study effectively.
5. I can prepare class notes in a well-organized manner.

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6. I can find various solutions to any problem.
7. I can create specific plans to achieve my goals.

These items are intended to capture social and interpersonal influences on students' academic confidence, together with perceptions of support, recognition, planning, and problem-solving capability. The final seven items are reported in the source document under Verbal Persuasion or Encouragement and Discouragement.

Dimension 4: Emotional and Physiological States or Psychological Responses: The present dimension addresses students' emotional responses during examinations and learning, their experiences of nervousness and mental pressure, their responses to new learning situations, retention of newly acquired information, and their ability to maintain psychological strength following academic failure. The seven final items are:

1. I can recall what I have learned during exams.
2. Teachers make me nervous in class.
3. As soon as I start studying, I begin to feel mental pressure.
4. I get anxious when I think about learning something new.
5. When I discover something new about a topic, I can relate it to other subjects.
6. I can remember new things for a long time after learning them.
7. Even if I fail in exams, I can keep my mental strength intact.

These statements collectively attempt to represent students' emotional and psychological responses to academic situations and their perceived capacity to maintain effective functioning despite academic pressure or setbacks. The seven items are reported in the final-item section of the uploaded instrument.

Reliability of the Self-Efficacy Scale: The reliability of the Roy and Sarkar Self-Efficacy Scale for School Students was examined through two complementary procedures: **test-retest reliability** and **internal consistency reliability**. Employing more than one form of reliability evidence provides a broader assessment of the consistency of scores produced by an instrument. Test-retest reliability addresses the stability of scores over time, whereas internal consistency examines the extent to which items within the scale function consistently in measuring the intended construct (DeVellis & Thorpe, 2021; Koo & Li, 2016).

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Test-Retest Reliability: Test-retest reliability was examined by administering the Self-Efficacy Scale to **120 Grade XI students** and subsequently re-administering the same instrument to the same group after an interval of **17 days**. Pearson's Product-Moment correlation was used to determine the relationship between the scores obtained during the two administrations.The resulting coefficient was:**Test-Retest Reliability: *r* = 0.791**, **Cronbach's Alpha: α = 0.861**

Norms of the Self-Efficacy Scale

Norms were established to facilitate the interpretation of individual scores obtained from the Roy and Sarkar Self-Efficacy Scale. Norm-referenced interpretation provides a practical framework for classifying respondents according to their relative level of the measured construct. The final instrument contains **28 items**, with each item scored on a five-point scale. Consequently, the theoretical minimum score is **28** and the theoretical maximum score is **140**.

The reported norms classify students into three levels of self-efficacy: **Low, Moderate, and High**.

Score Range	**Level**	**Interpretation**
28-65	Low Self-Efficacy	Students have low confidence in their abilities, depend more on others, and show less persistence in challenging situations.
66-103	Moderate Self-Efficacy	Students possess an average level of confidence and can perform tasks with some effort and guidance.
104-140	High Self-Efficacy	Students demonstrate strong confidence, persistence, and the ability to overcome academic challenges effectively.

These score ranges and interpretations are **reported directly in the uploaded Self-Efficacy Scale document** and are therefore retained without modification.The classification system provides a straightforward method for interpreting students' overall self-efficacy scores. Students obtaining scores between 28 and 65 are classified as having low self-efficacy, those scoring between 66 and 103 are classified as having moderate self-efficacy, and those obtaining scores between 104 and 140 are classified as having high self-efficacy. Higher scores therefore represent stronger perceived capability, confidence, persistence, and

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capacity to deal with academic challenges within the conceptual framework of the present instrument.

Conclusion

The Roy and Sarkar Self-Efficacy Scale for School Students was developed through a systematic and sequential process of theoretical conceptualisation, identification of dimensions, item generation, expert evaluation, preliminary pilot testing, empirical item analysis, reliability assessment, and establishment of norms. The development process was designed to produce a population-specific instrument capable of assessing self-efficacy among school students in a manner that reflects their academic and psychological experiences.

The final instrument consists of 28 items, equally distributed across four dimensions: Mastery Experiences, Vicarious Experiences, Verbal Persuasion, and Emotional and Physiological States. These dimensions provide a multidimensional representation of students' efficacy beliefs by incorporating personal performance experiences, observational experiences, social influences, and emotional or physiological responses. The final four-dimensional structure is consistent with the conceptual framework adopted during the development of the scale.

The item-analysis procedure provided evidence of satisfactory discriminatory characteristics among the retained items. Of the 32 items subjected to empirical analysis, 28 items were retained and four items were rejected because their *t* values did not demonstrate statistically significant discriminatory power. This empirical refinement contributed to the development of a more concise final instrument while preserving representation of the four identified dimensions.

The scale also demonstrated satisfactory reliability characteristics. The test-retest reliability coefficient of $r = .791$, obtained over a 17-day interval with 120 Grade XI students, indicates satisfactory temporal stability. Furthermore, the Cronbach's alpha coefficient of $\alpha = .861$ indicates good internal consistency among the items. Taken together, these findings provide preliminary evidence that the scale can produce reasonably stable and internally consistent measurements of self-efficacy among school students.

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