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Construction and validation of the scale measuring the self-efficacy of higher secondary students

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Abstract

This study focuses on the construction and validation of a Self-Efficacy Scale for Higher Secondary Students (SESHSS), designed to assess students' confidence in their ability to manage academic tasks, cope with challenges, and achieve educational goals. Self-efficacy, a critical factor influencing academic performance and personal development, necessitates the creation of a reliable and contextually relevant tool for measurement. The research employed a random sampling technique. Initially, a thorough literature review and group discussions with students, Psychologists, teachers and experts in the field of education were held in order to frame the relevant statements. Initially 40 statements were made. The scale was administered to a sample of 100 higher secondary students across different educational institutions of district Anantnag. The investigator has used normative survey method for the study. Item analysis was adopted for the final selection of items. The total scores were calculated separately and they were arranged in the descending order. The top 25% and the bottom 25% of scores alone were taken into account. The difference in means of the high and low groups for each item was tested for significance by computing the t- ratios. Items with 't' value of 1.96 and above were selected for the final tool. Thus 30 statements were selected and 10 have been eliminated. This scale provides educators, counsellors, and researchers with a psychometrically sound tool for assessing and enhancing self-efficacy among higher secondary students.

Keywords: Self-efficacy, higher secondary students, validity, reliability

Introduction

Self-efficacy, a concept introduced by Bandura (1997) [1], refers to a student's belief in their capability to organize and execute the actions required to manage prospective academic tasks. It plays a crucial role in determining how students approach goals, tasks, and challenges in their educational journey. Self-efficacy impacts cognitive, emotional, and motivational processes, influencing students' ability to persist through difficulties and adapt to new learning situations (Zimmerman, 2000) [6]. Students with high self-efficacy are more likely to set ambitious yet attainable goals, engage in deep learning strategies, and exhibit higher levels of effort and perseverance. This belief in their competence often leads to improved academic performance and greater satisfaction with their learning experience (Usher & Pajares, 2008) [5]. Moreover, self-efficacy is not only shaped by personal accomplishments but also by vicarious experiences, verbal encouragement, and physiological feedback, making it a dynamic construct that educators can foster intentionally (Bandura, 1997; Margolis & McCabe, 2006) [1, 4].

Importance of Self-efficacy

The Importance of self-efficacy for students lies in its profound influence on academic outcomes, motivation, and overall psychological well-being. Students with strong self-efficacy beliefs tend to exhibit lower levels of academic stress and anxiety, as they perceive challenges as opportunities for growth rather than as threats (Schunk & DiBenedetto, 2020) [7]. They are also more likely to seek assistance and employ adaptive strategies when faced with difficulties, enhancing their resilience and capacity for lifelong learning (Usher & Pajares, 2008; Klassen & Tze, 2014) [5, 2]. On the other hand, low self-efficacy can lead to a fixed mindset, avoidance behaviors, and a self-fulfilling cycle of underachievement

(Bandura, 1997) [1]. Educators and parents play a critical role in cultivating self-efficacy by creating supportive environments, providing constructive feedback, and encouraging students to reflect on their progress (Margolis & McCabe, 2006) [4]. This emphasis on fostering self-efficacy is essential for developing confident, motivated, and resilient learners prepared to succeed academically and beyond.

Objective

To develop a research tool to measure the Self- efficacy of Higher Secondary Students.

Self-efficacy Scale (SES) – Developed and Standardized by the Investigators

Self-efficacy Scale for higher secondary school students has been constructed by the investigators. The Self-efficacy Scale was constructed after having discussions with, psychologists, teachers and experts in the field of education. The scale has been prepared on five-point rating scale based on Likert's type. Initially 40 statements were prepared in English medium. The scoring procedure for the tool with the option strongly disagree as 1, Disagree as 2, Undecided as 3, agree as 4, and Strongly Agree as 5 for statements. The minimum score for the tool is '40' and maximum score of the tool is 200.

Pilot study

To validate this Self-Efficacy Scale, a Pilot Study has been conducted with a sample of 100 Higher Secondary Students studying in Anantnag District selected through Random sampling technique.

Materials and Methods

A lot of literature on Self-Efficacy and construction of tools have been consulted by the Investigators to construct the Self-Efficacy Scale for Higher Secondary Students. Consultations have been made with Psychologists, school teachers and experts in the field of education before finalizing the draft tool on Self-Efficacy.

The tool has been prepared on a five-point rating scale based on Likert's type. Initially, 40 statements were prepared in English Language. The scoring procedure for the tool with the options has the following points for each. For positive items, Strongly Agree is given 5, Agree is given 4, Undecided is given 3, Disagree is given 2 and Strongly Disagree is given 1. For negative items, scoring is reversed. The minimum score for the tool is '40' and maximum score of the tool is 200

Item analysis

The model/draft tool prepared by the Investigators was administered on a sample of 100 Higher Secondary Students. The students were asked to mark their opinion among the given alternatives. Each statement has five alternative responses; namely Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. Scoring was done for all the statements.

Item analysis was adopted for the final selection of statements. The total scores were calculated separately and they were arranged in the descending order of scores. The 25% of the subjects (upper group) with the highest total scores and the 25% of the subjects (lower group) with the lowest total scores were taken into account for analysis. The difference in Means of the high and low groups for each item was tested for significance by computing the t-ratios. Items with 't' value of 1.96 and above were selected for the final tool. The 't' value of 10 items were below1.96 and hence not selected for the final study. Thus, the final tool contains 30 items; the list of items with the-'t' value is presented in Table-1.The Split–half method was used to find out the consistency of the test. It has been given in Table-2.

Table 1: List of items selected for the final draft of the Self-Efficacy Scale based on their 't' value

Item No.	't' value	Remarks	Item No. in the final Draft of S.E.S
1	2.285	Selected	1
2	4.385	Selected	2
3	0.128	Not Selected	-
4	2.595	Selected	3
5	3.126	Selected	4
6	5.352	Selected	5
7	1.595	Not Selected	-
8	2.364	Selected	6
9	4.847	Selected	7
10	5.845	Selected	8
11	4.975	Selected	9
12	6.734	Selected	10
13	0.1835	Not Selected	-
14	4.059	Selected	11
15	2.175	Selected	12
16	0.524	Not Selected	-
17	3.492	Selected	13
18	4.159	Selected	14
19	4.354	Selected	15
20	5.067	Selected	16
21	1.560	Not Selected	-
22	2.532	Selected	17
23	3.374	Selected	18
24	4.418	Selected	19
25	5.880	Selected	20
26	1.474	Not Selected	-
27	0.029	Not Selected	-
28	3.019	Selected	21
29	2.245	Selected	22
30	1.359	Not Selected	-
31	6.544	Selected	23
32	4.931	Selected	24
33	2.465	Selected	25
34	0.458	Not Selected	-
35	4.138	Selected	26
36	5.529	Selected	27
37	1.178	Not Selected	-
38	3.698	Selected	28
39	2.335	Selected	29
40	3.124	Selected	30

Reliability

The reliability of test can be defined as the correlation between two or more sets of scores on equivalent tests from the same group of individuals. A test score is called reliable when we have reasons for believing the score to be stable and trust worthy. Stability and trustworthiness depend upon the degree to which the score is an index of "true-ability" free from chance error.

Test-retest (repetition) method was used to arrive at the

reliability of the tool. Repetition of a test is the simplest method of determining the agreement between the two set of scores; the test is given and repeated on the same group; and correlation was computed between the first and second set of scores. Given sufficient time between the two tests the administration results show the stability of the test scores. The value of correlation co-efficient shows that there is high positive degree of correlation between the two tests and are given in Table 2.

Table 2: Shows reliability co-efficient of self-efficacy

S. No.	Method of Reliability	Values
1	Test-retest (Repetition)	0.83
2	Split-Half	0.91

Validity

The appropriateness, meaningfulness and usefulness of these specific inferences are made from test scores. In research, if the findings are to be appropriate, meaningful and useful, they need to be valid. The first essential quality of a valid test is that it should be highly reliable. Besides, the content or face validity, the investigators intended to arrive at intrinsic validity. Guilford (1950) defined the intrinsic validity as "the degree to which a test measures what it measures". The square root of reliability gives the intrinsic validity. Therefore, the intrinsic validity of Self-Efficacy scales is 0.83.

Table 3: Interpretation of scores for self-efficacy scale for the students

S. No.	Percentiles	Value	Level of Self-Efficacy
1	P_{25}	74 & Below	Low
2	P_{25-75}	75-105	Average
3	P_{75}	106 & Above	High

Description of the final tool

The final tool with 30 statements was prepared in English. The tool has been prepared on a five-point rating scale based on Likert's type. The scoring procedure for the tool for positive items with the option Strongly Agree is given 5, Agree is given 4, Undecided is given 3, Disagree is given 2 and Strongly Disagree is given 1. The scoring is reverse for the negative items. The minimum score for the tool is '30' and the maximum score of the tool is 150.

Conclusion

This research tool focuses on gathering information about the self-efficacy of the students. Self-efficacy is essential for understanding and enhancing students' belief in their ability to succeed in academic and non- academic tasks. This scale provides educators, counsellors, and researchers with valuable insights into students perceived strengths and areas where they may need support. By assessing self-efficacy, stakeholders can identify barriers to learning, tailor interventions, and create environments that foster resilience, autonomy, and a growth mindset. High self-efficacy is strongly associated with greater engagement, improved problem solving skills, and the willingness to tackle challenges, while low self-efficacy often leads to avoidance behaviours, diminished effort, and academic struggles. Thus utilizing this scale not only facilitates targeted support but also empowers students to take ownership of their learning, enabling them to develop the confidence and skills needed to thrive in various contexts.

Conflict of interest: The authors declared no conflict of interest.

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