



Constructing Reliable and Valid Assessment Tool for Measuring Competencies in Educational Psychology

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ARTICLE INFO	ABSTRACT
Article History Article Submission 20November2022 Revised Submission 12January2023 Article Accepted 27January2023	This study focused to develop and validate a criterion tool for assessing deep knowledge on Educational Psychology among student teachers. The tool was designed based on key topics in Educational Psychology, including Maslow's Theory of Motivation, Piaget's Cognitive Theory, Pavlov's Classical Conditioning, Skinner's Operant Conditioning, and Social Learning Theories etc. Content validity was ensured through expert reviews, and reliability was assessed using Cronbach's alpha, which improved from 0.720 before item analysis to 0.91 after refinement. The final tool consisted of 60 multiple-choice questions (MCQs) selected after item analysis based on discriminative and difficulty indices. The results demonstrated high reliability and validity, suggesting the tool effectively measures knowledge, understanding, application, and skills. This research provides an innovative and robust approach to assessing Educational Psychology in teacher education programs.
	Keywords: Educational Psychology, Teacher Education, Criterion Tool, Student Teachers, Assessment.

INTRODUCTION

Teacher education is an indispensable part of the educational organization, it is linked with humanity and is accustomed by the ethos, culture, and character of a country. Educational Psychology plays a crucial role in helping pre-service teachers understand learning theories, cognitive development, and motivational strategies. Educational Psychology forms the backbone of teacher education programs, equipping prospective teachers with the theoretical knowledge and practical skills. It integrates principles from various psychological theories, including cognitive, behavioral, and social learning paradigms, to foster effective teaching practices. However, the assessment of Educational Psychology knowledge often lacks standardized tools that comprehensively evaluate both theoretical understanding and practical application.

This study addresses the need for a reliable and valid assessment instrument by designing a criterion tool tailored to student teachers. The tool's development was guided by theoretical frameworks such as Maslow's Hierarchy of Needs, Piaget's stages of cognitive development, and key behavioral theories. Its validation involved expert reviews for content accuracy and statistical methods for reliability. By focusing on multiple-choice questions with varying levels of complexity, the tool aims to assess core competencies in knowledge, understanding, application, and skills.

OBJECTIVES OF THE STUDY

1. To construct a criterion tool for assessing the knowledge of Educational Psychology among B.Ed. students.
2. To validate this criterion tool for measuring the knowledge of Educational Psychology among B.Ed. students.

Literature Review

Educational Psychology underpins the pedagogical strategies employed by teachers to foster learning. Studies have shown that effective teacher education programs incorporate both theoretical knowledge and practical skills derived from psychological principles (Eggen & Kauchak, 2021). Maslow's Hierarchy of Needs

emphasizes the importance of addressing students' physiological and psychological needs to enhance learning outcomes (Maslow, 1943). Piaget's stages of cognitive development provide insights into how students acquire knowledge and solve problems at different ages (Piaget, 1971). Pavlov's Classical Conditioning and Skinner's Operant Conditioning theories have been instrumental in understanding how learning occurs through reinforcement and stimulus-response mechanisms (Pavlov, 1927; Skinner, 1953). Assessments should evaluate how well students can apply these principles in classroom management. The reliability and validity of assessment instruments are critical for ensuring accurate measurement of learning outcomes. Cronbach's alpha is a widely accepted measure of internal consistency (Tavakol & Dennick, 2011). Item analysis, including discriminative and difficulty indices, is essential for refining test items to ensure they effectively differentiate between high- and low-performing students (Ebel & Frisbie, 1991).

METHODOLOGY

1. Tool Construction

The criterion tool was constructed in learning theories of Educational Psychology, namely, Maslow's Theory of Motivation and its educational implications, Cognitive Theory (Jean Piaget), Behaviourist Theory (Pavlov's Classical Conditioning, Skinner's Operant Conditioning), and Social Learning Theories. Each content area includes specific performance indicators to assess both theoretical understanding and application skills.

Knowledge Assessment: Multiple-choice questions (70) that evaluate factual and conceptual knowledge.

2. Validation Process

The validation of the criterion tool involved two key stages:

Content Validity: A panel of experts in the field of Educational Psychology from various Universities were reviewed the tool to ensure it covered relevant content areas and aligned with the core course of Educational Psychology for Tamilnadu Teachers Education University B.Ed. curriculum.

Weightage of Objectives in the Achievement Test for Educational Psychology Trial

Table 1.1

S. No	Objectives	Marks	Percentage
1	Knowledge	20	28.6
2	Understanding	20	28.6
3	Application	20	28.6
4	Skills	10	14.2

Table 1.2: Item-analysis Table (Discriminative and Difficulty Index)

Item	Discriminative Index	Difficulty Index	Remarks	Item	Discriminative Index	Difficulty Index	Remarks
1	63.33	0.33	S	36	60.00	0.67	S
2	56.67	0.50	S	37	68.67	0.33	S
3	80.00	0.73	NS	38	66.67	0.33	S
4	76.67	0.33	S	39	76.67	0.13	NS
5	73.33	0.67	S	40	56.67	0.37	S
6	73.33	0.50	S	41	76.67	0.33	S
7	80.00	0.50	NS	42	76.67	0.50	S
8	76.67	0.33	S	43	73.33	0.17	NS
9	73.33	0.67	S	44	70.00	0.33	S
10	73.33	0.50	S	45	76.67	0.50	S
11	66.67	0.33	S	46	70.00	0.37	S
12	63.33	0.67	S	47	70.00	0.33	S
13	80.00	0.83	NS	48	66.67	0.33	S
14	76.67	0.50	S	49	60.00	0.17	NS
15	73.33	0.50	S	50	73.33	0.50	S
16	80.00	0.83	NS	51	66.67	0.33	S
17	76.67	0.67	S	52	73.33	0.50	S
18	70.00	0.50	S	53	66.67	0.78	S
19	68.67	0.33	S	54	63.33	0.50	S
20	76.67	0.67	S	55	63.33	0.50	S
21	73.33	0.50	S	56	63.33	0.33	S
22	83.33	0.50	NS	57	73.33	0.33	S
23	60.00	0.50	S	58	63.33	0.33	S
24	76.67	0.50	S	59	73.33	0.50	S
25	73.33	0.33	S	60	66.67	0.67	S

26	73.33	0.33	S	61	66.67	0.33	S
27	80.00	0.67	NS	62	76.67	0.50	S
28	70.00	0.50	S	63	76.67	0.67	S
29	76.67	0.67	S	64	73.33	0.37	S
30	76.67	0.50	S	65	70.00	0.33	S
31	76.67	0.50	S	66	66.67	0.33	S
32	68.67	0.67	S	67	76.67	0.67	S
33	73.33	0.50	S	68	73.33	0.50	S
34	73.33	0.53	S	69	73.33	0.50	S
35	83.33	0.33	NS	70	60.00	0.50	S

NS – Removed Item

The above Table presents the value of Discriminative and Difficulty Index. Based on this value ten items were eliminated such as 3,7,13,16,22,27,35,39,43,49. Finally, the tool consists of 60 items after the item analysis. After finalizing the item analyses strategies, the investigator prepared the final draft of the tool.

Table 1.3: Reliability Statistics

Cronbach's Alpha	Number of Items
0.91	60

The above table shows that the Cronbach's alpha value is 0.91, indicating a high level of internal consistency for the tool after item analysis. This represents a strong reliability in the internal consistency aspects of the tool.

3 – Reliability and Validity

a) Reliability Analysis

In this study, the investigator used Cronbach's Alpha to establish the reliability of the tool. The Cronbach's alpha value of 0.91 was found to be significant, indicating that the tool is highly reliable.

b) Validity Technique

Validity refers to the extent to which a test measures what it is intended to measure. The content validity of the achievement tests was assessed by experts in the field of language and two specialists in education. The first draft of the achievement test was given to subject experts and teacher educators to evaluate its validity. The experts were asked to assess the following:

Weightage of Objectives in the Final Version of the Achievement Test

Table 1.4

S. No	Objectives	Marks	Percentage
1	Knowledge	18	30.00
2	Understanding	16	26.7
3	Application	18	30.00
4	Skills	8	13.3

RESULTS AND DISCUSSION

This study found that the importance of a well-constructed and validated assessment tool for Educational Psychology. The criterion tool was high reliability (Cronbach's alpha = 0.91), and indicating a strong internal consistency. The item analysis ensured that each question was discriminative in nature and appropriately challenging. This process not only improved the tool's reliability but also enhanced its validity by aligning the questions with core learning objectives.

The results highlight the suitability of the tool to measure the knowledge, understanding, application, and skills effectively in the learning theories of educational psychology. This is consistent with previous studies emphasizing the need for comprehensive assessment instruments in teacher education (Eggen & Kauchak, 2021). By addressing theoretical and practical aspects, the tool bridges the gap between academic knowledge and classroom application, aligning with the goals of teacher training programs.

CONCLUSION

In this study the investigators constructed and validated a criterion tool for assessing Educational Psychology knowledge among student teachers. The final tool, comprising of 60 well-constructed MCQs, demonstrated high reliability and validity. This tool is highly reliable to measures core competencies across knowledge, understanding, application, and skills, providing a robust framework for educational assessments.

This study contributes to the field of educational psychology by offering a standardized instrument that aligns with theoretical and practical objectives in teacher education. Future studies can expand on this work by exploring its applicability across diverse educational contexts and integrating technology to further enhance assessment practices.

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