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Development and Validation of a Scale to Measure Teachers' Perception of Competency-Based Education

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ABSTRACT

The growing emphasis on Competency-Based Education (CBE) in curriculum reforms necessitates a deeper understanding of how teachers perceive and implement its principles in classroom settings. This study aimed to develop and validate a standardized tool to measure secondary school teachers' perceptions of CBE. The tool construction followed a multi-phased procedure, beginning with an extensive literature review and expert consultation to identify key dimensions of CBE, including Understanding and Awareness, Attitudes and Beliefs, Implementation and Practice, Support and Resources, Student Engagement and Outcomes, Technological Integration, and Feedback and Continuous Improvement.

An initial pool of 88 items was developed and refined through expert review and pilot testing. After the first and second try-outs, item analysis was conducted using the t-test method based on upper and lower 27% criterion groups. Out of the 61 items retained for analysis, 48 items were found to be statistically significant and included in the final version of the scale. The reliability of the tool was established through Split-Half ($r = 0.88$) and Test-Retest ($r = 0.982$) methods, indicating strong internal consistency and temporal stability. Content and face validity were ensured through expert judgment.

The finalized tool, titled Teachers' Perception of Competency-Based Education Scale for Secondary School Teachers, provides a reliable and valid instrument for educational researchers, administrators, and policymakers to assess teacher readiness and attitudes toward CBE. This scale offers meaningful insights that can guide professional development programs and inform policy implementation at the school level.

Keywords: Competency-Based Education, Teachers' Perception, Tool Development, Scale Validation, Reliability, Content Validity

Introduction

In recent years, Competency-Based Education (CBE) has emerged as a transformative approach in global educational reform, aiming to equip learners with clearly defined competencies rather than solely focusing on traditional content delivery. CBE emphasizes mastery of skills, personalized learning, and flexible progression, allowing students to learn at their own pace until they demonstrate proficiency. Recognized for its learner-centric orientation, CBE aligns closely with 21st-century skill development, including critical thinking, collaboration, and lifelong learning readiness.

In the Indian context, the National Education Policy (NEP) 2020 strongly advocates for a shift from rote learning to competency-based, holistic, and experiential education. As schools and institutions begin to implement competency-based curricula and assessment methods, teachers play a pivotal role in this transition. Their understanding, attitudes, and classroom practices directly influence the success of CBE implementation. However, there is limited empirical evidence on how teachers perceive this paradigm shift, especially at the secondary school level in India.

Given this gap, there arises a need for a standardized, valid, and reliable tool to measure teachers' perception of Competency-Based Education. Understanding their perceptions can help identify readiness, training needs, and systemic challenges in adopting CBE. It also provides a foundation for designing targeted interventions, continuous professional development programs, and policy support.

The present study was undertaken to develop and validate a scale that systematically captures various aspects of teachers' perceptions of CBE. The tool was designed to assess multiple dimensions such as teachers' understanding of CBE principles, their beliefs and attitudes, classroom implementation strategies, available institutional support, and use of technology and feedback for continuous improvement.

This article details the step-by-step process of constructing and standardizing the Teachers' Perception of Competency-Based Education Scale, ensuring its psychometric soundness through rigorous item analysis, expert validation, and statistical reliability testing.

Rationale for the Construction of the Tool

The implementation of Competency-Based Education (CBE) represents a significant shift in pedagogical philosophy and practice. Moving away from traditional content-heavy instruction, CBE focuses on learners achieving clearly defined competencies at their own pace, using flexible pathways and assessment methods. While policy frameworks such as the National Education Policy (NEP) 2020 in India have strongly advocated for CBE, the success of this reform largely depends on how well it is understood and embraced by teachers—the key agents of change in educational settings.

Despite growing interest in CBE, there is a lack of standardized tools in the Indian context that can effectively measure teachers' perception of CBE. Understanding how teachers interpret, accept, and implement the principles of CBE is crucial for its successful integration into classroom practices. A teacher's perception influences not only their instructional methods but also the way students experience and benefit from the learning process.

Given the diversity of educational backgrounds, school environments, and resource availability across India, it is essential to develop a contextually relevant and psychometrically sound tool. Such a tool should provide insights into multiple dimensions of teacher perception, including their awareness, attitudes, classroom implementation practices, access to support systems, technological integration, and use of feedback for continuous improvement.

The rationale for constructing this tool lies in the need to:

- ✓ Systematically assess how teachers perceive various components of CBE;
- ✓ Identify areas of strength and gaps in understanding and implementation;
- ✓ Support teacher training and professional development programs based on empirical data;
- ✓ Provide a research-based instrument for policymakers, administrators, and educators to guide CBE adoption;
- ✓ Contribute to the existing body of knowledge on CBE through a reliable and validated measurement tool.

Thus, the Teachers' Perception of Competency-Based Education Scale was developed with the aim of offering a structured, reliable, and valid means of assessing how secondary school teachers engage with CBE in practice and belief. This tool will not only facilitate academic research but also support data-driven decision-making in the educational landscape.

Objectives of the Study

The main objective of the present study was to construct and validate a standardized tool to assess secondary school teachers' perceptions of Competency-Based Education (CBE). This tool aims to provide a reliable measure of teachers' understanding, attitudes, and classroom practices related to the principles and implementation of CBE.

The specific objectives of the study were as follows:

1. To identify and define the core dimensions that represent teachers' perceptions of Competency-Based Education.
2. To construct an initial pool of items based on literature review, expert input, and theoretical framework relevant to CBE.
3. To validate the content and face validity of the tool through expert judgment and consensus.
4. To administer the preliminary form of the scale to a sample of secondary school teachers and carry out item analysis.
5. To refine and finalize the tool by selecting items that show strong discriminatory power based on statistical analysis.
6. To establish the reliability of the scale using the Split-Half method and the Test-Retest method.
7. To establish the construct and content validity of the final scale.
8. To develop a dimension-wise distribution of items and name the final tool: Teachers' Perception of Competency-Based Education Scale for Secondary School Teachers.

These objectives guided the systematic development, refinement, and validation of the scale, ensuring that it would serve as a psychometrically robust instrument for educational research and policy implementation related to Competency-Based Education.

Methodology

The present study followed a systematic, multi-phased approach to develop and validate a standardized tool for measuring secondary school teachers' perceptions of Competency-Based Education (CBE). The methodology comprised planning, item construction, expert validation, pilot testing, item analysis, and reliability and validity assessment.

Research Design

The study adopted a descriptive survey design, focusing on tool development and standardization. A structured, Likert-type scale was created and administered to a representative sample of teachers. Quantitative analysis was employed to ensure the psychometric soundness of the tool.

PHASES OF TOOL CONSTRUCTION

Phase l Planning of the Stage

The construction of the Perception of Teachers about Competency-Based Education Scale was initiated with a clear understanding of the goals and framework of Competency-Based Education (CBE). The primary objective was to develop a valid and reliable instrument to assess how teachers perceive and engage with the core principles of CBE in their professional practice. The scale was conceptualized to capture multiple dimensions of CBE, reflecting a comprehensive view of its implementation in schools. This process began with an extensive review of relevant literature, educational policy documents, curriculum frameworks, and expert inputs to identify the most critical dimensions of CBE to be included in the tool.

Once the dimensions were finalized, a 5-point Likert-type response format was selected to measure the degree of agreement with each statement, ranging from "Strongly Disagree" to "Strongly Agree." Care was taken to ensure that the statements were clearly worded, contextually appropriate, and unbiased. To enhance accessibility and ease of understanding, all items were prepared in English.

Phase ll Selection of Items

A thorough review of literature revealed that various researchers have proposed different dimensions to understand Competency-Based Education (CBE). To ensure the tool developed would be relevant and culturally appropriate for the Indian educational context, the investigator consulted senior educationists and psychologists. Through these expert discussions, a preliminary list of seven dimensions reflecting key components of CBE was identified. This list was then shared with a panel of 15 experts from the fields of education, psychology, and sociology. The experts were asked to evaluate the appropriateness and relevance of each dimension. Only those dimensions that received at least 80%

consensus among the experts were selected for inclusion in the final scale. As a result, the finalized Perception of Teachers about Competency-Based Education Scale included the following seven dimensions:

1.Understanding and Awareness,
2. Attitudes and Beliefs,
3. Implementation and Practice,
4. Support and Resources,
5. Student Engagement and Outcomes,
6. Technological Integration, and
7. Feedback and Continuous Improvement.

Once the dimensions were confirmed, a draft of 88 items was prepared, with 10 to 12 items under each dimension. These items were then reviewed by 15 expert judges in the fields of education, psychology, and sociology. Each judge was requested to assess whether the items were relevant to teachers' perceptions of CBE and whether they were consistent with the identified dimensions. Based on the feedback and suggestions provided, items that achieved 80% or more agreement were retained. In total, 61 items were shortlisted, while others were either modified or eliminated to enhance clarity and relevance. This expert validation process played a critical role in ensuring the content validity and contextual fit of the scale for measuring teachers' perceptions of Competency-Based Education in Indian schools.

Phase lll: First Try-Out

The first draft of the Perception of Teachers about Competency-Based Education Scale was presented to a panel of 15 experts drawn from the fields of Education, Psychology, Sociology, and Language. These experts were asked to critically evaluate each item based on four key criteria: clarity of wording, relevance to the specific dimension, appropriateness for secondary school teachers, and the overall quality and balance of the scale. Their feedback was carefully reviewed, and items that were found to be vague, repetitive, or misaligned with the intended dimension were either revised or eliminated. As a result of this rigorous review process and expert consensus, the total number of items was reduced from 88 to 61, ensuring a more refined and focused tool. The revised distribution of items across the seven dimensions reflected a well-balanced structure suitable for effectively assessing teachers' perceptions of Competency-Based Education.

Dimensions	Number of Items in First Draft	Number of Items in Second Draft
Understanding and Awareness	12	9
Attitudes and Beliefs	14	9
Implementation and Practice	13	8
Support and Resources	12	9
Student Engagement and Outcomes	13	10
Technological Integration	12	9
Feedback and Continuous Improvement	12	7
Total Items	88	61

Phase IV: Description of Teachers' Perception of Competency-Based Education Scale

The Teachers' Perception of Competency-Based Education Scale is a standardized tool developed to assess how secondary school teachers perceive various aspects of Competency-Based Education (CBE). The scale is designed to capture teachers' understanding, attitudes, and experiences related to the implementation and effectiveness of CBE

within classroom settings. It aims to provide meaningful insights into how well teachers align with the principles of CBE and the challenges they may encounter in its execution.

The final version of the scale consists of 61 items distributed across seven dimensions that collectively reflect the key components of CBE. These dimensions are:

1. Understanding and Awareness: This dimension measures teachers' knowledge about the principles, objectives, and philosophy behind CBE. It includes items that assess how well teachers understand the shift from traditional education to a competency-based framework.
2. Attitudes and Beliefs: This section focuses on teachers' personal and professional beliefs regarding the importance, benefits, and practicality of CBE. It reflects their readiness and openness to adopt this educational approach.
3. Implementation and Practice: This dimension evaluates the extent to which teachers incorporate CBE in their daily classroom practices. It includes items on lesson planning, assessment alignment, and the use of student-centred instructional strategies.
4. Support and Resources: This aspect assesses the availability and adequacy of institutional support, infrastructure, training, and teaching materials required to implement CBE effectively.
5. Student Engagement and Outcomes: This section captures teachers' perceptions of how CBE impacts student motivation, participation, learning outcomes, and overall development.
6. Technological Integration: This dimension examines how technology is integrated into the teaching-learning process to support competency-based learning, including the use of digital tools for instruction and assessment.
7. Feedback and Continuous Improvement: This dimension focuses on the use of feedback systems and reflective practices to enhance teaching effectiveness and student progress in a CBE environment.

Each item is rated on a 5-point Likert-type scale, ranging from Strongly Disagree (1) to Strongly Agree (5). Both positively and negatively worded items are included to reduce response bias. The total score indicates the overall perception of the teacher toward Competency-Based Education, while sub-scores provide specific insights into each individual dimension.

This tool serves as a valuable instrument for educational researchers, school administrators, and policymakers in understanding the readiness and effectiveness of teachers in implementing CBE. The scale also offers a basis for designing targeted professional development programs and improving CBE practices in schools.

Phase V: Second Try-Out

The second try-out of the Teachers' Perception of Competency-Based Education Scale was conducted to perform item analysis and refine the scale based on statistical evaluation. The purpose of this phase was to identify the most effective items that accurately measured the intended dimensions and to eliminate those that were ambiguous, inconsistent, or statistically weak.

For this purpose, the revised scale comprising 61 items was administered to a randomly selected sample of 100 school teachers working in various secondary schools. Each teacher was asked to respond to all items individually under standardized conditions. The items were presented using a 5-point Likert-type scale, with the response options being: Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly Disagree (1) for positively worded statements. For negatively worded statements, the scoring was reversed to maintain consistency in the direction of scores and to reduce response bias.

This try-out was crucial for determining the discriminatory power of each item and ensuring that only those items that meaningfully distinguished between high and low scorers on the scale would be retained. The responses gathered during this phase served as the basis for the statistical item analysis carried out in the subsequent phase.

Phase VI: Item Analysis

The prepared draft was administered to a randomly selected sample of 100 teachers from the secondary and senior secondary schools. Subjects were requested to respond to each item and the responses of the items were expressed in terms of the following five options: Strongly Agree, Agree, andNeutral, Disagree and Strongly Disagree. These items were scored as 5, 4, 3, 2 and 1 respectively. On the contrary, the negative items were scored in completely reverse order. Firstly, all the 100 response sheets were arranged in descending order. On the basis of the total scores of the subjects, the two groups were selected-27% high score group (top 27 teachers) and 27% low score group (bottom 27 teachers) and subjected to t-test computation. Only those items were retained which were found significant either at 0.05 level or 0.01 level of significance. Thus, out of 58 items 17 items (not significant items) were rejected and 48 items (significant items) were retained for the final form of the scale. The obtained t-values are given below

Phase VII: The Final Form of the Scale

Item Analysis based on Mean Differences between Upper (27%) and Bottom (27%). Criterion Groups of Perception of Teachers about Competency-Based Education Scale

Items	Lower Mean M1	Upper MeanM2	t- values	
1	2.97	4.1	2.8**	Accept
2	3.57	4.17	1.8	Reject
3	3.27	4.0	3.04**	Accept
4	3.4	4.57	5.3**	Accept
5	3.43	4.67	4.4**	Accept
6	3.23	4.63	5.4**	Accept
7	3.67	4.5	4.9**	Accept
8	3.53	4.6	3.6**	Accept
9	3.63	4.27	3.2**	Accept
10	3.53	4.73	4.8**	Accept
11	2.47	4.23	6.8**	Accept
12	3.17	3.43	0.81	Reject
13	3.17	4.47	4.6**	Accept
14	3.03	4.0	3.2**	Accept
15	3.0	4.3	4.6**	Accept
16	3.13	4.43	5.4**	Accept
17	2.77	4.57	6.0**	Accept
18	4.07	4.27	0.91	Reject
19	3.57	4.47	3.8**	Accept
20	3.43	4.73	4.6**	Accept
21	2.93	4.63	5.7**	Accept

22	3.27	4.5	4.7**	Accept
23	3.37	4.5	4.03**	Accept
24	3.3	4.27	3.7**	Accept
25	3.37	4.77	5.4**	Accept
26	3.3	4.4	3.9**	Accept
27	3.9	4.53	3.2**	Accept
28	2.97	3.03	0.17	Reject
29	2.5	3.13	2.4*	Accept
30	3.3	4.53	4.1**	Accept
31	3.67	4.5	3.5**	Accept
32	2.7	2.9	0.56	Reject
33	3.13	4.53	5.0**	Accept
34	3.37	4.5	4.3**	Accept
35	3.13	4.67	6.42**	Accept
36	3.93	3.73	0.83	Reject
37	3.47	4.57	4.6**	Accept
38	4.3	4.57	1.4	Reject
39	3.77	4.6	2.8**	Accept
40	3.13	3.53	1.1	Reject
41	3.3	4.1	2.5*	Accept
42	3.07	4.63	5.9**	Accept
43	4.2	4.37	0.53	Reject
44	3.13	4.27	3.8**	Accept
45	3.3	4.57	5.3**	Accept
46	3.97	4.3	1.03	Reject
47	3.7	4.1	1.21	Reject
48	2.97	4.47	4.3**	Accept
49	2.33	4.73	12.0	Accept
50	3.8	4.07	1.04	Reject
51	3.47	4.7	4.7**	Accept
52	3.63	4.8	4.9**	Accept
53	3.5	4.57	3.2**	Accept

54	2.77	4.37	4.38**	Accept
55	3.8	4.07	1.04	Reject
56	3.47	4.7	4.7**	Accept
57	3.63	4.8	4.9**	Accept
58	3.5	4.57	3.2**	Accept
59	2.77	4.37	4.38**	Accept
60	3.33	4.8	4.9**	Accept
61	3.43	4.53	4.23**	Accept

In the final form of the Perception of Teachers about Competency-Based Education Scale after item analysis of 61 items: 13 items were rejected and 48 items (41 positive and 7 negative) were selected for the scale. The serial number wise distribution of the items in seven dimension is being presented below:

No.	**Dimension**	**Nature of Item**	**No. of Items**	**Total No of Items**	**Total**
1	Understanding and Awareness	Positive	1,8,25,26,35,38,40	07	08
		Negative	9	01	
2	Attitudes and Beliefs	Positive	2,10,27,30,39,41	06	07
		Negative	29	01	
3	Implementation and Practice	Positive	3,12,24,28,31,34,42	07	08
		Negative	11	01	
4	Support and Resources	Positive	4,13,23,32,33,43	06	07
		Negative	14	01	
5	Student Engagement and Outcomes	Positive	5,15,16,22,44	05	06
		Negative	45	01	
6	Technological Integration	Positive	6,17,20,46,48	05	06
		Negative	47	01	
7	Feedback and Continuous Improvement	Positive	7,18,21,36,37	05	06
		Negative	19	01	
	Full Scale (Positive Items = 41 + Negative Items = 07) Total Items 48				

Phase VIII: Establishing Reliability and Validity of the Tool

Reliability

The reliability of the scale was established with the help of Split-Half method, and Test-Retest method

Split-Half Reliability-The reliability of the Perception of Teachers about Competency-Based Education scale was ascertained by 'Split-Half Method'. For this, items of Perception of Teachers about Competency-Based Education scale

were distributed to two parts: one containing even items and other containing odd items. Each part of the scale thus comprised of 24 items (both positive as well as negative items) belonging to all seven aspects of Competency-Based Education. After applying Spearman- Brown Prophecy, formulae the reliability coefficient (r) for whole Perception of Teachers about Competency-Based Education scale came out to be 0.88 which is significant at .01 level of significance.

Test-Retest Reliability-For Test-Retest Reliability, a separate sample of 25 teachers was randomly selected and was administered the Perception of Teachers about Competency-Based Education Scale. The same sample was again administered the scale after an interval of 15 days. The coefficient of correlation got was 0.982, which is significant at .01 level of significance.

Validity

The unanimity of 10 experts about the items was taken as an indicator of face validity of the scale. For content validity, the dimensions were selected and again given to the experts to assess the relevancy of the items to the content being measured by the scale. The scale can be considered to be valid enough in terms of item validity because only those items were retained in the final form of the scale which were found significant either at 0.05 level or 0.01 level

Phase XI: Naming of the Tool

Teachers' Perception of Competency-Based Education Scale for Secondary School Teachers.

Educational Implications

The development of the Teachers' Perception of Competency-Based Education Scale holds significant educational value, particularly in the context of ongoing reforms aimed at promoting Competency-Based Education (CBE). As teachers are central to the successful implementation of CBE in classrooms, this tool provides a reliable means to assess their readiness, beliefs, and practices related to this educational model.

One of the key implications of the scale is its ability to inform teacher training and professional development initiatives. By identifying specific dimensions where teachers may lack understanding or confidence—such as implementation strategies, technological integration, or assessment methods—school leaders and educational planners can design targeted in-service programs to bridge those gaps. This ensures that professional development is need-based and practical rather than generic or theoretical.

Additionally, the scale serves as a valuable resource for policymakers and curriculum developers. The data generated through its use can offer insights into how well the principles of CBE are being adopted at the school level. This evidence-based understanding can guide decisions related to the pace of reform, resource allocation, and the design of support systems for teachers.

For teacher education institutions, the scale can also be employed within pre-service and induction training programs. It allows for early identification of trainees' attitudes and perceptions toward CBE, helping institutions plan instructional strategies that promote alignment with competency-based approaches. Furthermore, it can be used as a reflective tool to assess progress over time and ensure that new teachers are adequately prepared for modern classroom demands.

At the school level, administrators can use the findings to evaluate the institutional climate surrounding CBE. The tool highlights how supported teachers feel in terms of resources, training, and feedback mechanisms, thus enabling more strategic school-level planning. It can also be a catalyst for fostering a culture of self-reflection among teachers, encouraging them to think critically about their practices and make informed changes that align with CBE principles.

Finally, the tool contributes to academic research by offering a standardized, validated instrument for future studies. Researchers can use it to explore correlations between teachers' perceptions of CBE and variables such as student outcomes, teacher effectiveness, or institutional performance. In this way, the scale not only supports implementation but also helps build a broader evidence base for competency-based education in India and beyond.

Conclusion

The shift toward Competency-Based Education (CBE) represents a significant transformation in the educational landscape, emphasizing mastery of skills, learner autonomy, and personalized progress. In this evolving context, understanding how teachers perceive and engage with CBE is essential for successful policy implementation and classroom practice. The present study addressed this need by developing and validating a standardized tool—the

Teachers' Perception of Competency-Based Education Scale—to measure secondary school teachers' perceptions across key dimensions of CBE.

The tool was constructed through a systematic, multi-phase process that included planning, item selection, expert validation, two rounds of try-outs, item analysis, and statistical testing for reliability and validity. The final version of the scale consists of 48 carefully selected items representing seven core dimensions: Understanding and Awareness, Attitudes and Beliefs, Implementation and Practice, Support and Resources, Student Engagement and Outcomes, Technological Integration, and Feedback and Continuous Improvement. The tool demonstrated high reliability and strong content validity, supported by expert input and rigorous item analysis.

This scale serves as a practical and research-based instrument for educators, researchers, and policymakers to assess the readiness and alignment of teachers with competency-based practices. It not only offers insights into areas of strength and challenge but also supports targeted professional development, reflective practice, and informed decision-making in the adoption of CBE. The findings and methodology of this study contribute meaningfully to the growing body of educational research in India and provide a foundation for further exploration and refinement of competency-based teaching and learning practices.

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