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DEVELOPMENT AND STANDAREDISATION OF CRITICAL THINKING TEST IN SOCIAL STUDIES AT SECONDARY LEVEL

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ABSTRACT:

Critical thinking is self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way. the concern for teaching critical thinking skills is getting momentum in the education system everywhere in the world. critical thinking skills are crucial for one to remain up to date and proficient in the fast-paced and competitive world. in the era of massive information and technology explosion, there is an urgent need for students to learn to think critically. This paper deals with the development and standardization of critical thinking test in socialstudies at secondary level.

KEYWORDS: *Critical Thinking, Social Studies, cognitive skills.*

INTRODUCTION

Critical thinking skills are essential for individuals to live, work and function effectively in a society. Almost all professions, including education, engineering, management, medical, finance, politics and legal, demand critical thinking abilities in individuals. Employees working in industry, business and information technology need to think clearly and rationally in order to solve problems systematically. To come up with a proper solution to a problem, existing practices may have to be evaluated and modified to improve their performance and to find alternative ways and means to do things.

The literature related to critical thinking was reviewed in order to identify the instruments that can measure critical thinking ability. From the review it was found that Ennis- Weir Critical Thinking Essay Test and the California Critical Thinking Disposition Inventory were widely used by many researchers for this purpose. Many researchers have placed heavy reliance on multiple choice tests to measure critical thinking (Norris, 1988). The Watson- Glaser Critical Thinking Appraisal (Watson and Glaser, 1980) is one of the oldest and most widely used critical thinking tests. It is reported to have served as a benchmark for judging the validity of other critical thinking tests and for evaluating the effectiveness of teaching for critical thinking development. But these tests were intended to measure general Critical thinking ability. The Watson- Glaser Critical Thinking Appraisal consist of the dimensions like Inference, Recognition of Assumptions, Deduction, Interpretation and Evaluation of arguments.

However, it was felt that there was a need to construct a Critical thinking test in social studies suitable for students of IX standard and therefore it was decided to construct a new critical thinking test on social studies as a

part of this study, with due consideration to the age of students, nature and purpose of the study.The Cognitive skills given in the Delphi Report (1990) were adopted for the construction of the Critical Thinking Test on social studies which is used in this study, since the Delphi report was found to be an authentic document created through a consensus reached by eminent scholars in the field of Psychology, Philosophy, social Science and Education. Delphi report contains detailed description of the cognitive skills and sub skills of Critical thinking. The Cognitive skills and sub skills adopted from the Delphi Report that are taken as dimensions to develop Critical Thinking Test in social studies:

Cognitive skills and sub-skills of critical thinking in the Delphi Report (1990)

1. Interpretation To comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures, or criteria.
1.1 Categorisation: to apprehend or appropriately formulate categories, distinctions, or frameworks for understanding, describing or characterizing information; to describe experiences, situations, beliefs, events, etc., so that they take on comprehensible meanings in terms of appropriate categorizations, distinctions, or frameworks.
1.2 Decoding significance: to detect, attend to, and describe the informational content, affective purport, directive functions, intentions, motives, purposes, social significance, values, views, rules, procedures, criteria, or inferential relationships expressed in convention – based communication systems, such as in language, social behaviors, drawings, numbers, graphs, tables, charts, signs and symbols.
1.3 Clarifying Meaning: to paraphrase or make explicit, through stipulation, description, analogy or figurative expression, the contextual, conventional or intended meanings of words, ideas, concepts, statements, behaviors, drawings, numbers, signs, charts, graphs, symbols, rules, events or ceremonies; to use stipulation, description, analogy or figurative expression to remove confusing, unintended vagueness or ambiguity, or to design a reasonable procedure for so doing.
2. Analysis To identify the intended and actual inferential relationships among statements, questions, concepts, descriptions or other forms of representation intended to express beliefs, judgments, experiences, reasons, information, or opinions.
2.1 Examining Ideas: to determine the role various expressions play or are intended to play in the context of argument, reasoning or persuasion; to define terms; to compare or contrast ideas, concepts, or statements; to identify issues or problems and determine their component parts, and also to identify the conceptual relationships of those parts to each other and to the whole.
2.2 Detecting Arguments: given a set of statements, descriptions, questions or graphic representations, to determine whether or not the set expresses, or is intended to express, a reason or reasons in support of or contesting some claim, opinion or point of view.
2.3 Analysing Arguments: given the expression of a reason or reasons intended to support or contest some claim, opinion or point of view, to identify and differentiate: (a) the intended main conclusion, (b) the premises and reasons advanced in support of the main conclusion, (c) further premises and reasons advanced as backup or support for those premises and reasons intended as supporting the main conclusion, (d) additional unexpressed elements of that reasoning such as intermediary conclusions, unstated assumptions or presuppositions, (e) the overall structure of the argument or intended chain of reasoning, and (f) any items contained in the body of expressions being examined which are not intended to be taken as part of the reasoning being expressed or its intended background.
3. Evaluation To assess the credibility of statements or other representations which are accounts or descriptions of a person's perception, experience, situation, judgment, belief, or opinion; and to assess the logical strength of the actual or intend inferential relationships among statements, descriptions, questions or other forms of representation.

3.1 Assessing Claims: to recognize the factors relevant to assessing the degree of credibility to ascribe to a source of information or opinion; to assess the acceptability, the level of confidence to place in the probability or truth of any given representation of an experience, situation, judgment, belief or opinion. For example: to recognize the factors which make a person a credible witness regarding a given event or credible authority on a given topic; to determine if a given principle of conduct is applicable to deciding what to do in a given situation; to determine if a given claim is likely to be true or false based on what one knows or can reasonably find out.
3.2 Assessing Arguments: to judge whether the assumed acceptability of the premises of a given argument justify one's accepting as true (deductively certain), or very probably true (inductively justified), the expressed conclusion of that argument; to anticipate or to raise questions or objections, and to assess whether these point to significant weakness in the argument being evaluated; to determine whether an argument relies on false doubtful assumptions or presuppositions and then to determine how crucially these affect its strength; to judge between reasonable and fallacious inferences; to judge the probative strength of an argument's premises and assumptions with a view toward determining the acceptability of the argument; to determine and judge the probative strength of an argument's intended or unintended consequences with view toward judging the acceptability of the argument; to determine the extent to which possible additional information might strengthen or weaken an argument.
4. Inference To identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses; to consider relevant information and to educate the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation.
4.1 Querying Evidence: In particular, to recognize premises which require support and to formulate a strategy for seeking and gather information which Might supply that support; In general, to judge hat information relevant to deciding the acceptability, plausibility or relative merits of a given alternative, question, issue, theory, hypothesis, or statement is required, and to determine plausible investigatory strategies for acquiring that information.
4.2 Conjecturing Alternatives: to formulate multiple alternatives for resolving a problem, to postulate a series of suppositions regarding a question, to project alternative hypotheses regarding an event, to develop a variety of different plans to achieve some goal; to dram out presuppositions and project the range of possible Consequences of decisions, positions, policies, theories, or beliefs.
4.3 Drawing Conclusions: to apply appropriate modes of inference in determining what position, opinion or point of view one should take on a given matter or issue; given a set of statements, with the proper level of logical strength, their inferential relationships and the consequences or the presuppositions which they support, warrant, imply or entail; to employ successfully various sub-species of reasoning, as for example to reason analogically, scientifically, etc.; to determine which of several possible conclusions is most strongly warranted or supported by the evidence at hand, or, which should be Rejected or regarded as less plausible by the information given.
5. Explanation To state the results of one's reasoning; to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological and contextual considerations upon which one's results were based; and to present one' reasoning in the form of cogent arguments.
5.1 Stating Results: to produce accurate statements, descriptions or representations of the result of one' s reasoning activities so as to analyze, infer from, or monitor those results.
5.2 Justifying Procedures: to present the evidential, conceptual, methodological, logical and contextual considerations which one used in forming one's interpretations, analyses, evaluation or inferences, so that one might accurately record, evaluate, describe or justify those processes to one's self or to others, or so as to remedy perceived deficiencies in the general way one executes those processes.

5.3 Presenting Arguments: to give reasons for accepting some claim; to meet objection to the method, conceptualizations, evidence, criteria or contextual appropriateness of inferential, analytical or evaluative judgments.

6. Regulation Self-consciously to monitor one's cognitive activities, the elements used in those activities, and the results educed, particularly by applying skill in analysis and evaluation to one's own inferential judgments with a view toward questioning, confirming, validating, or correcting either one's reasoning or one's results.
6.1 Self-Examination: to reflect on one's own reasoning and verify both the results produced and the correct application and execution of the cognitive skills involved; to make an objective and thoughtful meta-cognitive self-assessment of one's opinions and reasons for holding them; to judge the extent to which one's thinking is influenced by deficiencies in one's knowledge, or by stereotypes, prejudices, emotions or any other factors which constrain one's objectivity or rationality; to reflect on one's motivation, values, attitudes and interests with a view toward determining that one has endeavored to be unbiased, fair-minded, thorough, objective, respectful of the truth, reasonable, and rational in coming to one's analyses, interpretation, evaluations, inferences, or expressions.
6.2 Self-Correction: where self-examination reveals errors or deficiencies, to design reasonable procedures to remedy or correct, if possible, those mistakes and their causes.

Procedure Followed for the Construction of the Critical Thinking Ability Test

The procedure followed for the construction of the Critical Thinking Ability Test is described in the following sections.

1. Item pooling

Initially there were 54 multiple choice items based on the cognitive skills and sub skills. These items were discussed with subject experts and based on their scrutiny and criticisms, few items were modified and some were removed accordingly. Hence the final tool also had forty-five multiple choice items which were chosen for the pilot testing. The duration of the test was one hour and thirty minutes. Sample questions used in the tools are:

Q1. Read the passage carefully, Human beings live in houses built with wood, stones, bricks and other such materials and those who lives in extreme cold climates save themselves from cold by making clothes with the skin and fur of the sheep and other animals and they use weapon and tools to hunt their food and gather vegetables and fruits for their consumption. Put a tick mark against the statement that clears the meaning of the above passage. a) The way they live in house. b) Characteristics features of human being. c) Difference of human being with animals. d) The hunting habit of human being.

Q2. Investigations made at different locations by Kerala state pollution control board ascertain the fact that many harmful gases and dust particles that pose threat to the health have crept to the atmosphere. From that in Trivandrum a report published regarding on ambient quality of air at over bridge shows that Nitrigen Oxide, Fine Particles etc are above the original permissible level. This is harmful to the atmosphere and danger to the life of the people. What do you think the threatening statement conveys? a) The danger that persist in atmosphere. b) The gases and particles level in atmosphere. c) A study on atmosphere. d) To reduce the pollution level.

Q3. You have seen the Ganesha festival being celebrated in your locality. There was an argument between your parents regarding the Ganesha idol that they are going to purchase. Your father says that he is going to buy a Ganesha idol which is painted colourfully. But your mother wants to buy Ganesha idol which is not painted by chemicals as she feels that the water should not be polluted by chemicals when they immerse Ganesha. What will you suggest to resolve the argument? a) I will support mother because the Ganesha idol which is not painted by chemicals not pollute the water. b) I will support my

father as it is easy to purchase a Ganesha idol made of chemicals. c) I will not raise my opinion d) None of the above.

2. Initial try out:

The critical thinking test was administered to a small group of 10 pupils who were about to complete their IX standard following the state syllabus. This was done to know the time duration, clarity of the items and to understand some words that are difficult to follow. The items were again modified based on the results obtained from these students who participated in the initial try out.

3. Validity of the test:

To establish the face validity, the items of the critical thinking test were subjected to experts' evaluation. The experts confirmed that the items included in the critical thinking test are valid and relevant for measuring critical thinking of ninth standard pupils. The items that were asked to reject, modify or accept were done based on the opinion, criticism and suggestions obtained from the experts.

4. Reliability of the test:

A representative sample of one hundred students in three divisions of IX standard were chosen for establishing reliability of the critical thinking test using test- retest method. Since it was the beginning of the academic year and the students of X standard had just entered after their completion of IX standard, it was found that they are the right sample for conducting the final try out. It was conducted in two divisions of X standard from Govt School in Thiruvananthapuram located in Kerala. Before the administration of the test, the purpose of the test was made clear to the students. The draft test material and response sheets in sufficient numbers were provided. All the necessary guidelines about the test and additional information needed were given. The retest was again conducted for the same sample with the same tool after a gap of fifteen days. The performance of both the test and retest were analysed for its reliability.

The reliability of the critical thinking test was established using Test- retest method. The correlation coefficient of the two sets of scores was calculated by using the Pearson's Product Moment correlation. The coefficient of correlation was found to be 0.72. The obtained values of reliability suggest that the test has acceptable psychometric qualities to measure the critical thinking of IX standard pupils.

The category wise reliability was also found out wherein the test retest scores of each dimension were considered for their reliability coefficient. The category wise reliability coefficients are given in table 2.1.

Table .1. Category wise reliabilities of CT in social studies

Sl No.	Category of critical thinking skill	No. of items	Reliability coefficient
1	Interpretation	9	0.49
2	Analysis	8	0.47
3	Evaluation	6	0.39
4	Inference	8	0.63
5	Explanation	8	0.58
6	Self-regulation	6	0.41

The category wise reliability values were found to be relatively low. But, because of the less number of items in these categories, these values were treated as satisfactory. The Cronbach's α (alpha)which is a coefficient of reliability was also used to measure the internal consistency and the reliability coefficient was found to be 0.79. Cronbach's alpha is a coefficient of reliability, which is commonly used as a measure of internal consistency or reliability of a psychometric test. The inter-correlations among test items are maximized when all items measure the

same construct, Cronbach's alpha is widely believed to indirectly indicate the degree to which a set of items measures a single Uni-dimensional latent construct. . In this Quasi experimental study, this Critical Thinking Test on social studies was administered as pre tests and post test to measure Critical Thinking on social studies in the Experimental and Control group.

Table 2: Details of critical thinking test

	Skill	No. ofQuestions		QuestionNumbers	Total
		Initial	Final		
1.	Interpretation	10	9	1,2,3,4,5,6,7,8,34	9
2.	Analysis	9	8	9,10,11,13,14,21,18,35	8
3.	Evaluation	9	6	19,22,32,33,44,45	6
4.	Inference	9	8	15,23,31,27,28,29,30,36	8
5.	Explanation	10	8	12,16,20,2437,38,39,41	8
6.	Self-Regulation	7	6	17,25,2640,42,43	6
	Total	54	45		45

CONCLUSION

Critical thinking dialogues can be used to provide students ample opportunity to verbally interact with the teacher and one another. In the social studies classroom, students could discuss current events and debate various aspects of social issues and students should be involved in real and relevant activities. Students could hold a mock election and follow the process from voter registration, through party conventions, to voting. Students could interview a resident about a local issue and present the information in a public forum. To aid the critical thinking development process, the curriculum could be written in such a way that a student could move from manipulation of the concrete to the symbolic. Once students have mastered the basic concepts, they could identify a problem, its research components, take a position for solving the problem and defend that position. Critical thinking provides teachers with an understanding of how students' progress in their logical thoughts. Students could be provided with activities and challenges appropriate to different levels. An example in the social studies classroom could include assisting students to clarify the meaning of what they say and write when they are asked to take a position on an issue or hold a specific point of view.

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