

## Effect of Critical Thinking on Decision Making Efficacy of Students at Senior Secondary Level

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### ABSTRACT

In the era of information explosion, people are mostly being characters in the global arena of multiple affairs. The students as the future citizens should be prepared to face the arena of multifaceted affairs in different aspects of life. The trend of information generation is mostly caused by rising probability of incessant problems that everyone treads footsteps either to overcome it or be a victim to it. The most important survival strategy is to develop the ability of making decision effectively. This ability is found to be catalyzed by critical thinking skill of an individual. Decision making is an important algorithm in solution of divergent problems that adolescent students are constantly encountering. This paper is meant for exploring correlation between Critical Thinking and Decision-making ability and the effect of critical thinking ability on decision making for resolving problems. This study was conducted on a sample size of 50 male and 50 female Students of two Senior-Secondary schools situated in urban and rural areas in the District of Hooghly in West Bengal, India. Quantitative analysis of data was done by finding coefficient of correlation and regression between critical thinking ability and decision-making ability and also by finding difference in decision making ability in respect of Gender and Critical Thinking ability. The result showed a significant positive correlation and regression between Critical Thinking and Decision-making ability of Senior Secondary Students. A significant difference was also observed in Decision-making ability in respect of Critical Thinking ability and Gender.

**Keywords:** *Psychology, Education, Adolescence, Critical Thinking, Decision-making ability*

Students in modern era set different purposes in course of their academic and social life. They have a concern for academic and professional success and at the same time, they see avenues to enjoy social status, family stability and a secure life in future. It is a global nature of their prospective outlook. A marked difference is observed in respect of traditional means to secure future life and 21<sup>st</sup> century Gen-Z, 5G category of Senior Secondary student. According to Wikipedia, 'Generation Z are the children of Generation X or older Millennials'; therefore, Gen Z belongs to the 21<sup>st</sup> century. Later than Gen Z, 5G breed comes into being who is fond of a fast life with highest level of precocity or early maturity. This generation of students being achievers of early maturity, synchronize their thoughts and choices at an ultrafast algorithmic processing speed. Each step of their

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decision-making process takes a vital role to mark the algorithm of achievement in life. Academic success has a utilitarian purpose that does not simply based on being gluttonously fed with knowledge or information but also on development of skills through knowledge and information-construction. Constant upgradation of Cognitive-grid of Schema as stated by Piaget in his theory of Cognitive development impels adolescent individuals to make a judicious use of Critical Thinking ability to make decisions in all walks of life. Today's decision goes a long way to build or destroy career, still more, developing a budding life itself. It depends on how multifariously one can use one's knowledge, information and experience together acquired from diverse spheres of studies and activities and associate those convergently to make an impactful decision for further action. An ever-modifying and remodeling cognitive kaleidoscope keeps on adjusting and readjusting itself in temporal, locational and causal perspectives for the purpose of coping with time, place and context for a purposeful survival. This is the way of life for the new breed of learners to establish themselves with a social, professional and utilitarian bent of mind. A challenging disposition of attaining a prospective life compels students to think critically about imminent, prominent or probable issues and delve deep into those for finding solutions. This is a universal socio-cultural and developmental dynamics that needs close observation regarding the process of critical thinking and making decisions on that basis.

### ***Critical Thinking:***

Critical thinking is an intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing and evaluating information gathered from belief or action. This process has a universal value and it transcends all divisions and narrow compartmentalization of disciplines. Critical thinking is also characterized by its precision, accuracy, clarity, consistency and relevance.

### ***Importance of Critical Thinking:***

Critical Thinking is an important executive trait of thinking. According to Wallis (2020), A comprehensive understanding of the potential benefits of Critical Thinking are:

- Giving an Insight into how the inherent tendencies of human reasoning can result in resolving problems.
- Genuine and enduring commitment to improve the way one gathers, organizes, and utilizes information.

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- Adequacy of knowledge and experience: Thinking ability can be developed by constant exposure to different objects and phenomena and interaction with human word. Increasing knowledge and experience generate thoughts in an individual. It helps either to solve problems or to develop ideas and concepts and sparks off innovative ideas in an individual.
- Adequate motivation: Motivation is an important precondition of positive and constructive thinking. If thinking is considered a positive activity of mind and not a passive concern, the guiding principle of need works as an important motivation for purposeful thinking. Productive thoughts need be energized by motivation and this

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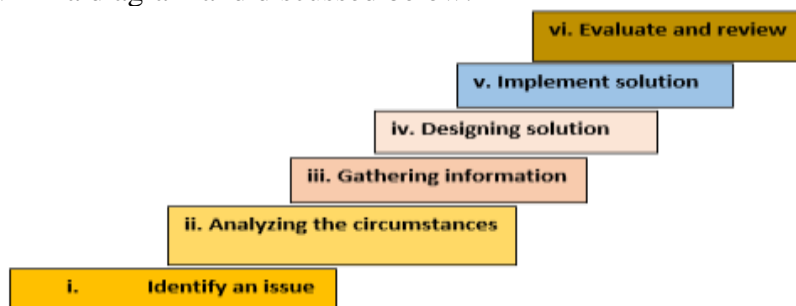
will mobilize relevant knowledge and experience for a constructive edifice of thought.

- Adequate freedom and flexibility: Individual thinking should not get obstructed by social and superstitious restrictions. Flexibility of thought and its expression can make thinking structured and productive. This can result in coming out with a satisfying decision and solution to a problem.
- Incubation: Incubation is state of thinking deep into a problem either to identify its nature of a problem or to find out a solution to it. Incubation is dynamic process of permutation and combination of knowledge and experience for understanding the nature of a problem or phenomenon before selection of solutions and choosing the best possible solution for managing a problem.
- Adequate reasoning process: Thinking is dynamic in nature and it is not a static pondering on what happened in past. It is by nature an analysis of its cause and effect and finding out the way of its avoidance and solution. So, thinking has a logical basis and reasoning is its backbone.
- Concept formation and structured expression: Each problem or phenomenon is characterized by its unique essence. Proper identification of it and clarity of the concept of it facilitates thinking critically on it and establishing a causal connection between its occurrence and related consequence. The medium of concept formation, analysis and assigning the effects of it is language and the same instrumental function is performed by language for verbal transformation of perceptions and thoughts and consequent expression of this.
- Intelligence and wisdom: Strong cognitive ability is a precondition for a productive thought. Intelligence is the mental ability to analyze an event and to assign cause and effect to it. In the same way, wisdom is an extraction of an individual's knowledge and experience. This helps in predicting an outcome and being alert to unfavorable consequence.

### Decision Making:

Decision-making is defined in psychology as the cognitive process that culminates in the choice of a belief or a course of action from a variety of feasible alternative possibilities. It could be irrational or logical. This is the process of selecting a course of action by defining a decision, acquiring data, and evaluating potential options.

A decision-making process is a series of steps one or more individuals take to determine the best option or course of action to address a specific problem or situation. (Sheldon et al. (2024) The first step of making decision is to identify an issue and analyzing the circumstances. Sheldon et al. (2024) also shows steps in making decisions i.e. gathering information, designing solution, implement solution, evaluate and review. These steps are shown in a diagram and discussed below:



*Figure 1 Diagram on Steps in Decision-Making*

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- Identify an issue: The first step is to identify an issue or the probable issues needs a solution and the matter that needs a decision. This is the primary cause that triggers off a decision in consequence.
- Analyzing the circumstances: The second step is to use circumspection for conditioning a probable solution. It is important to take into consideration the factors that are responsible for creating an issue and weigh their relative effect on the issue.
- Gathering information: Information needs to be collected to apprehend the causes of the issues and why an turns out a major problem.
- Designing solution: Once circumspection and information regarding an issue is complete, probable solutions are devised so that the these can alternatively be used for resulting in the best efficacy.
- Implement solution: Thereafter, the solution is applied to resolve an issue and the decision on applying the solution is verified.
- Evaluate and review: Finally, the decision regarding applying the solution is evaluated and further review is done. Any negative outcome leads to making an alternative decision to apply another devised solution to test its efficacy.

Making decisions can be seen of as a problem-solving process that results in a solution that is thought to be ideal, or at least acceptable. As such, it's a process that can be based on explicit or implicit information and beliefs, and it might be more or less reasonable or irrational.

### REVIEW OF LITERATURE

Researches and studies have been made on critical thinking ability and its effect of decision making and there were different observations on it. Yaldiz and Bailey (2019) highlighted the importance of Critical Thinking ability for right decision making. Turan et al. found a significant effect of Critical Thinking on Decision making ability of professionals. Helsdingen et al. (2010) conducted a study on the effect of Critical Thinking ability on Decision making strategy and they found a significant effect of Critical Thinking ability. Swiger (2005) conducted a correlational study of Critical Thinking and Decision Making and the researcher found a positive correlation. While studying the level of Decision-Making ability of male and female students, Saryanto et al. (2021) found that male students are better at decision making ability than the female students.

#### *Objectives of the study*

- To find correlation between Critical Thinking and Decision-making ability of Senior Secondary students
- To predict variability of Decision-Making ability with variation in Critical Thinking ability of Senior Secondary students
- To find the effect of Critical Thinking on Decision-making ability of Senior Secondary students
- To find difference in Decision-making ability between male and female students at Senior-Secondary level

#### *Hypotheses*

- There is no Significant correlation between Critical Thinking and Decision-making ability of Senior Secondary students.
- No significant difference is observed in Decision-making ability with variation in Critical Thinking ability of Senior Secondary Students.

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- There is no significant effect of Critical Thinking on Decision-making ability of Senior Secondary students.
- No significant difference in Decision-making ability exists between Male and Female students of Senior Secondary schools.

### ***Population and sample***

Senior secondary students from West Bengal Council of Higher Secondary Education (WBCHSE)-affiliated schools in the Kolkata, West Bengal, were chosen for the population of this study. In order to select 100 Senior-Secondary Male and Female students collectively from two schools—one urban and one rural—in the North 24 Parganas district of West Bengal, India, the Random Sampling method was used. Two schools have been chosen by using stratified random sampling method: first to find schools affiliated to WBCHSE, then Senior Secondary level and then in Rural and Urban locations.

## **METHODOLOGY**

Descriptive statistic is calculated to recognize the nature of data collected by applying Critical Thinking Scale (CTS) constructed by Prof. Hemant Lata Sharma and Priyamvada in the year 2022 and Decision-making ability test developed at University of Arizona by calculating Means, Standard Deviation, standard errors, Skewness and Kurtosis. The tools were standardized by using test-retest method. Inferential statistics with t-tests, correlation statistic and regression analysis were adopted to test hypotheses. Overall, quantitative research design has been used for this study.

### ***Variables:***

Dependent variable for this study was Decision-Making (DM) ability and Independent variable was Critical Thinking and Gender.

### ***Research Design:***

Correlation and regression analysis were conducted to show how the variables were related and how Decision-making ability differed with Critical Thinking ability; two levels: high and low levels of Critical Thinking scores have been categorized and test of Decision-Making ability has been conducted for both the groups separately. T-tests have been conducted to analyze significant difference in Mean scores to test hypothesis.

***Tools for the study:*** For this study, two research tools were administered:

1. Critical Thinking Scale (CTS) constructed by Prof. Hemant Lata Sharma and Priyamvada in the year 2022
2. Test of Decision Making developed at University of Arizona (U.S.A.) in 2022

Dr. Prof. Hemant Lata Sharma and Priyamvada's standardization of CTS: There are 85 statements in this test, with a 5-point Likert scale used for response. For piloting, the test was run on 250 samples. At the 0.01 level of significance, the reliability coefficient of the test is 0.98. The tool was earlier produced by National Psychological Corporation (Agra, U.P., India) and was standardized.

The University of Arizona in the United States established the standardization of the Test of Decision Making. This test, which consists of 21 questions, was standardized by using the test-retest procedure on a pilot sample of 25 students spaced one week apart to assess reliability. Reliability coefficient of the questionnaire was calculated 0.71.

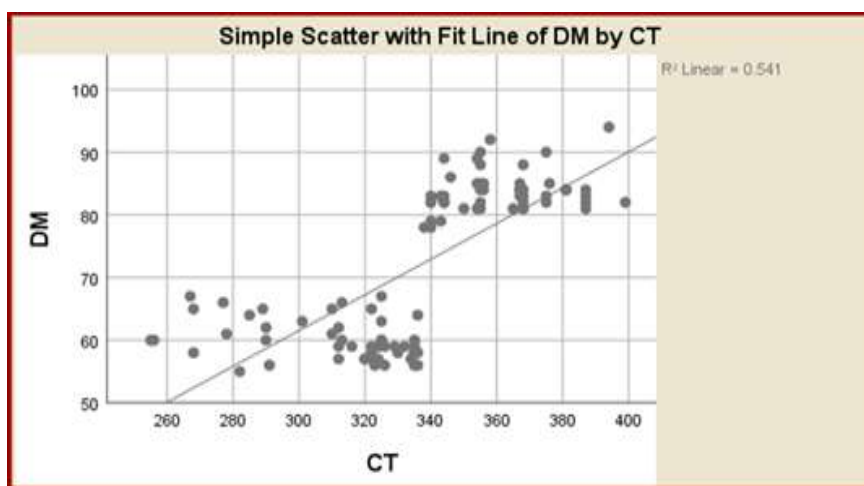
**Data analysis and Interpretation:**

Tests of critical thinking (CT) and decision-making (DM) were used to gather two sets of data, and the corresponding scores were entered into SPSS and MS Excel for analysis. The output is interpreted and shown below in the form of tables and a graph. The following table shows the Means of the scores in Critical Thinking and Decision-Making Ability i.e. 336.25 and 71.87 along with Medians and Modes to show the central tendency of both scores. Standard Errors show how sample means vary from population means. Means, Medians and Modes in the following table present a skewed distribution of data and the values are indicated accordingly. Kurtosis of 0.00 of CT scores gives an indication that the distribution has the same shape as found in normal distribution and Kurtosis of -1.73 of DM scores indicates that the distribution has lighter tails than the normal distribution. Descriptive Statistic is shown as the primary analysis of the data below:

**Table 1: Descriptive Statistic**

<i>CT</i>		<i>DM</i>	
Mean	336.25	Mean	71.87
Standard Error	3.18	Standard Error	1.23
Median	337	Median	72.5
Mode	368	Mode	82
Standard Deviation	31.82	Standard Deviation	12.33
Sample Variance	1012.57	Sample Variance	152.23
Kurtosis	0.00	Kurtosis	-1.73
Skewness	-0.48	Skewness	0.022

The main analysis of the data is provided by descriptive statistics, which are followed by correlation analyses of the two sets of CT and DM score data. Correlation coefficient Critical Thinking and Decision-making is 0.73 and both are positively correlated as the Figure 2 and Table 1 demonstrate. Therefore,  $H_0$  (**Hypothesis i**) is not retained and thus, established that there is a significant correlation between Critical Thinking and Decision-making ability of Senior Secondary students at 0.05 level. The following Figure and Table shows the Correlation between CT and DM:



**Figure 2: Correlation between DM and CT**

**Table 1 Correlation Matrix of DM and CT**

		Correlation	
		DM	CT
DM	Pearson Correlation	1	.735
	Sig. (2-tailed)		.000
	N	100	100

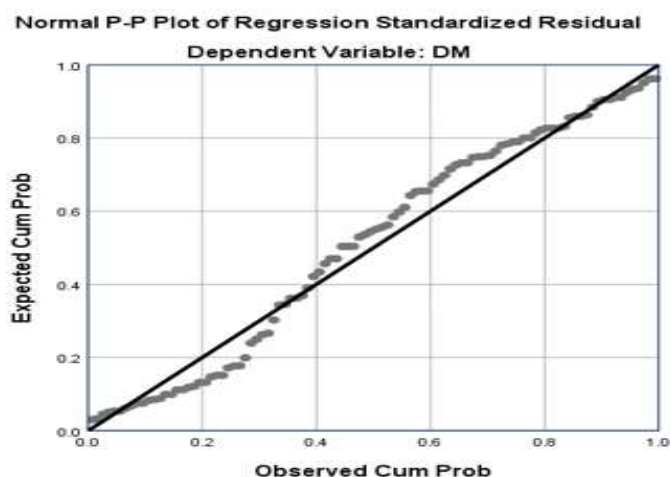
The ‘r’ Significant at 0.05 Level

Regression analysis of Critical Thinking and Decision-making ability was conducted to observe difference in DM with CT. The following table shows the output:

**Table 2: Regression Output**

Hypothesis	Regression Weights	R Squared	$\beta$	t -Value	p-value	Lev. of Sig.	Result
H <sub>0</sub>	CT → DM	.541	.285	10.74	.00	0.05	Not Retained

The output shows R-Squared value is .541 that implies 54.10% change in DM with CT and  $\beta$  shows 28.50% change for every SD increase in the predictor variable, CT. The t-value 10.74 shows that regression is significant at 0.05 level. Thus, H<sub>0</sub> (**Hypothesis ii**) is not retained. The P-P plot reflects a predictive view of variation in DM with CT as shown below:



**Figure: 3 Linear Regression Graph**

The difference between the Mean scores of High Critical Thinking and Conflict Resolution Ability and Low Critical Thinking and Conflict Resolution Ability was also calculated through analysis. There are two stages of critical thinking—High and Low—that are developed for analytical purposes. For the study, the average CT score was not considered. The scores greater than Average CT were considered ‘High’ and less than Average CT were considered ‘Low’. The following table shows a significant difference between the Means, 83.7 and 60.04 respectively since t-value 35.69 is greater than t-critical value at 0.05 level of significance. This analysis shows that Senior Secondary students having High Critical Thinking ability (HCT) are better in Decision-Making but those with Low Critical Thinking ability (LCT) have low Decision-Making ability. Therefore, **Null Hypothesis (iii)** not accepted and it is established that there is a significant effect of Critical Thinking on

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Decision-making ability of Senior Secondary students. A significant difference in Decision-Making between two levels of CT was observed in this analysis as shown in following table.

**Table 3: Output of t-test**

Dependent Variable	Independent Variable Levels	N	Mean	t-value	Level of Sig. (α)	df	p	t-critical value
DM	HCT	50	83.7	*35.69	0.05	98	0.00	1.66
DM	LCT	50	60.04					

*\*Significant at 0.05 level*

Analysis has also been conducted to find difference in Decision-making ability in respect of Gender. The following table shows the means of Male and Female DM 79.68 and 83.7 respectively. This output shows a significant difference in DM in respect of Male and Female students and Female students are found to be more efficient in Decision-Making than the Male students as against the observation of Saryanto et al. (2021) who found Male individuals are better in DM than the Female counterparts. The t-value 2.68 is significant at 0.05 level of significance. Therefore, the **Null Hypothesis (iv)** is not retained and a significant difference in Decision-making ability exists between Male and Female students of Senior Secondary schools. Following table shows the outcome of t-test:

**Table 4: Output of t-test**

Dependent Variable	Independent Variable Levels	N	Mean	t-value	Level of Sig. (α)	df	p	t-critical value
DM	Male	50	79.68	*2.68	0.05	98	0.00	1.67
DM	Female	50	83.7					

*\*Significant at 0.05 level*

## DISCUSSION

Critical Thinking ability, as a psychological determiner poses, as an important explanatory factor affecting Decision-making ability of the adolescent students at Senior Secondary Level. There are different psychological factors which are responsible for difference in Decision-Making ability. This study shows a quantitative analysis of correlation between CT and DM. A significant positive correlation was observed that implies the higher the level of CT the better is DM. Regression analysis shows how DM varies with CT; Second, difference in the means of DM in respect of HCT and LCT proves that a significant difference exists in DM in respect of HCT and LCT. Again, a significant difference is observed between Male DM and Female DM in the second t-test. This proves that a significant difference exists between Male Decision-making ability and Female Decision-making ability and the outcome verifies Female students have higher Decision-making ability than the Male students at Senior Secondary Level.

## CONCLUSION

Multifaceted and multidimensional workings in mind pose as important factors behind positive and negative consequence of your thinking. Critical thinking ability is seen such a factor that has a guiding effect on Decision-making on different issues and problems in a diaspora of individual affairs. Different student is seen to vary from others in making a notch in future career and shining in life. This is caused by variability in Decision-making ability



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of the Senior Secondary students in their adolescence. This study as an analytical proof behind variability of Decision-Making ability and the contribution of Critical Thinking ability in finding problems and making decisions is established. A gender difference is also observed in Decision-Making ability in that the Female students are more efficient in Decision-Making than Male counterparts. Thus, the importance of Critical Thinking ability for Decision-Making ability of Senior Secondary students is established in this study.

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### Conflict of Interest

The author(s) declared no conflict of interest.

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