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"Analysis &Comparison of Decision Making Ability after Consummation of Customized Solutions& Training Programme"A Pilot Study

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Abstract:*Decision-making can be defined as problem-solving activity terminated by a solution deemed to be satisfactory. It is therefore a process which can be rational or irrational and can be based on explicit knowledge or tacit knowledge. The decision-making process is regarded as a continuous process integrated in the interaction with the environment. The in hand research was conducted to investigate the level of improvement in Decision Making Ability (DMA) of children after the successful implementation of customized solutions and Training Programme based on Cognitive Science Education Technology. The research was conducted in and around Chandigarh. The sample consisted of 50 school going students between 10-12 years of age from different schools. Random sampling was followed. The sample was divided into two groups-Experimental Group (Group-1) and the Control Group (Group-2). Experimental group was provided customized solutions and Training Programme. After the successful completion of the Programme for One Year, it was discerned that the experimental group excelled in terms of Decision Making Ability whereas the DMA of control group went through but insignificant changes.*

Keywords
** Decision Making Ability (DMA)*
**Customized solutions & Training Programme*
** Experimental Group*
** Control Group*

I. Introduction

Decision-making is the process of identifying and choosing alternatives based on the values and preferences of the decision-maker. Decision-making is regarded as the cognitive processresulting in the selection of a belief or a course of action among several alternative possibilities. Every decision-making process produces a final choice that may or may not prompt action. Authors have described **Decision Making Ability (DMA)** as a measurement of speed of decision making ability & response time to accomplish assigned tasks. It is considered to be a backbone factor to achieve success. It is a ratio of application vs. age & time. DMA range is explained as in Table 1

Table-1:- DECISION MAKING ABILITY	
ABOVE 1.7	EXTREME
1.4-1.7	EXCELLENT
1.0-1.4	VERY GOOD
0.8-1.0	GOOD
0.65-0.80	ABOVE AVERAGE
0.50-0.65	AVERAGE
0.35-0.50	BELOW PAR
BELOW 0.35	POOR

A major part of decision-making involves the analysis of a finite set of alternatives described in terms of evaluative criteria. Logical decision-making is an important part of all science-based professions, where specialists apply their knowledge in a given area to make informed decisions. The decision-maker's environment can play a part in the decision-making process. For example, environmental complexity is a factor that influences cognitive function. Studies done at the University of Colorado have shown that more complex environments correlate with higher cognitive function, which means that a decision can be influenced by various factors. An experimentwas conducted to measure the complexity in a room thereby assessing that the cognitive function was greatly affected by the higher measure of environmental complexity making it easier to think about the situation and make a better decision.In the 1980s, psychologist Leon Mann and colleagues developed a decision-making process called GOFER, which they taught to adolescents. The process was based on extensive earlier research conducted with psychologist Irving Janis. GOFER is an acronym for five decision-making steps:

- Goals: Survey values and objectives.

- Options: Consider a wide range of alternative actions.
- Facts: Search for information.
- Effects: Weigh the positive and negative consequences of the options.
- Review: Plan how to implement the options.

In 2007, Pam Brown of Singleton Hospital in Swansea, Wales, divided the decision-making process into seven steps

- Outline your goal and outcome.
- Gather data.
- Develop alternatives (i.e., brainstorming).
- List pros and cons of each alternative.
- Make the decision.
- Immediately take action to implement it.
- Learn from and reflect on the decision.

In 2009, Professor John described how the Arkansas Program, an ethics curriculum at the University of Arkansas, used eight stages of moral decision-making based on the work of James

- Establishing community: Create and nurture the relationships, norms, and procedures that will influence how problems are understood and communicated. This stage takes place prior to and during a moral dilemma.
- Perception: Recognize that a problem exists.
- Interpretation: Identify competing explanations for the problem, and evaluate the drivers behind those interpretations.
- Judgment: Sift through various possible actions or responses and determine which is more justifiable.
- Motivation: Examine the competing commitments which may distract from a more moral course of action and then prioritize and commit to moral values over other personal, institutional or social values.
- Action: Follow through with action that supports the more justified decision.
- Reflection in action.
- Reflection on action.

According to Isabel Briggs Myers, a person's decision-making process depends to a significant degree on their cognitive style. Myers developed a set of four bi-polar dimensions, called the Myers-Briggs Type Indicator (MBTI). The terminal points on these dimension are- Thinking and feeling; extroversion andintroversion; judgment and perception; and sensing and intuition. She claimed that a person's decision-making style correlates well with how they score on these four dimensions. For example, someone who scored near the thinking, extroversion, sensing, and judgment ends of the dimensions would tend to have a logical, analytical, objective, critical, and empirical decision-making style. However, some psychologists say that the MBTI lacks reliability and validity and is poorly constructed. Decision-making is a region of intense study in the fields of systems neuroscience, and cognitive neuroscience. Several brain structures, including the anterior cingulate cortex(ACC), orbitofrontal cortex and the overlapping ventromedial prefrontal cortex are believed to be involved in decision-making processes. A neuroimaging study found distinctive patterns of neural activation in these regions depending on whether decisions were made on the basis of perceived personal volition or following directions from someone else. Patients with damage to the ventromedial prefrontal cortex have difficulty making advantageous decisions. Decision making processes involve cognition, and psychological theories concentrate on explaining how people make choices, in particular the cognitive processes that underlie choice. Empirical research on how people make decisions covers a range of different people in different situations. However, it suggests that different people in different situations frequently think about decisions in the same way, reflecting the fact that human beings have a common set of cognitive skills (Hastie and Dawes, 2001). These cognitive skills and their limitations are also influential in constraining choices so that choice making in reality varies from what may be seen as ideal and logical. Personality factors influence all aspects of the choice-making process, including the way a situation/problem is perceived, the extent to which a person wants to take control of making a decision, the extent to which a person uses/seeks out information; the desire to involve others in the decision-making process; the person's preferred decision-making style; the type of decision they made and the extent to which a person feels the need to justify their decision to others. Decision Making and cognitive capacity are interwoven. The psychological theories of choice and decision-making described earlier highlight the fact that making choices can be highly costly in terms of the cognitive effort associated with gathering and then assessing and comparing information. Not unsurprisingly, therefore, within psychological research on choice/decision-making theory there is a body of work on the impact of 'cognitive capacity' on

choice-making. This includes work on the effect of drugs (for example, opiates), personality disorders and other mental health problems, neurodegenerative disease, brain injury, ageing and learning disabilities on the decision-making process and decision-making efficacy. In addition, there has been work which has looked at 'softer' differences in cognitive capacity (such as numeracy skills) and their impact on performance in decision tasks. All this work is based on the notion that impairments of, or limitations in, cognitive capacity will impact on choice/decision-making ability.

Customized solutions & training programme

Customized solutions & training programme is scientifically designed for school students, Namely; The Backbencher, Superskills, Masterclass, i class. The Program is designed to increase the learning process of the students. The programme is based on the unique learning style of each student, to elevate and reorder their cognitive abilities to desired levels. As per the programme, irrespective of the number of students & with their different variety of learning styles, teachers and parents can still attend & focus on an individual student. Every student will grasp the concept delivered by the teacher with equal understanding. One major difference between the said programme and a normal class is teacher's and parents' command over the students thereby aiding in drastic increase in student academic performance.

II. Method

The research was conducted in and around Chandigarh. The sample for the pilot study consisted of 50 school going students between 10-12 years of age from different schools. Random sampling was undertaken to select subjects who were then divided into two groups. The first group Group-1 was the Experimental Group, on whom the Customized Solutions & TrainingProgramme was implemented. On the contrary, the Control group did not have access to the said programme. The data collected was analysed as per the set methodology. The tool used was Cognitive Ability Test and Assessment. This test helps to numerically measure cognitive ability factors (like Focus, Decision Making Ability, Creativity, Dynamic IQ) termed as natural ingredients for success in life in general. In this research, the 'Decision Making Ability' factor has been emphasized.

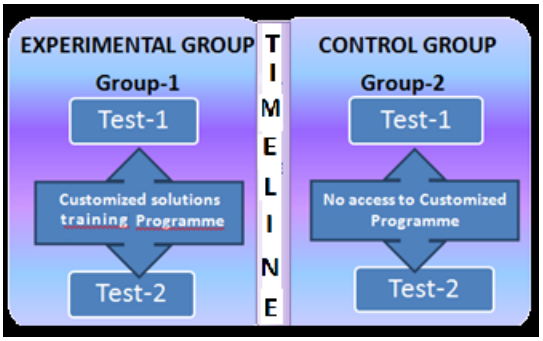

Fig.1 Methodology

2.1 Participants

Random sampling was undertaken to select subjects both males as well as females from different schools aging between 10-12 years. The sample was divided into two groups. The first group Group-1 was the Experimental Group, on whom the **C**ustomized solutions &training programme was implemented. On the contrary, the Control group did not have access to the said programme.

2.2 Stages Of Study - The Groups were compared in sixstages.

1. DMA of each subject in Experimental Group (Group-1) was compared in Test-1 and Test-2
2. DMA of each subject in Control Group (Group-2) was compared in Test-1 and Test-2
3. DMA of Experimental Group (Group-1) was compared with that of the Control Group (Group-2) in Test-1
4. DMA of Control Group (Group-2) was compared in their Test-1 and Test-2
5. DMA of Experimental Group (Group-1) was compared in their Test-1 and Test-2
6. DMA of Experimental Group (Group-1) was compared with that of the Control Group (Group-2) in Test-2

2.3 Statistical Analysis

Once the data was obtained, it was coded, tabulated and analyzed, keeping in mind the objectives of the study. Appropriate statistical tools were used to draw meaningful inferences. The statistical tools used in the present study are given in the table below;

Table 2 Statistical tools used for analysis of data

S.No.	Statistical tools	Formula	Purpose
1.	Mean (x)	X = ΣX/N where, X = Variable N = No. of sample	To find out the average scores of variable used in the study.
2	Standard Deviation (S.D.)	0 = ✓Σ x / N Where X = Deviation from actual mean X = mean. X = variable. N = number of samples.	To find out deviation from the mean scores of the variables.
3.	Standard error of mean (S.E)	S.E = 0/n Where 0 = S.D. n= number of observations	To find out the degree to which the mean is affected by the error of measurement and sampling.
4.	't' test	t = (x1-x2) / S ✓n1n2/n1 + n2 where x1 = mean of 1st sample x2 = mean of second sample S = combine S.D. n1 = number of observations in 1st sample. n2 = number of observations in 2nd sample	To compare the average score of any two groups or to find out whether the mean of the two samples vary significantly from each other.

III. Results and Discussion

STAGE-1

DMA of each subject in Experimental Group (Group-1) was compared in Test-1 and Test-2

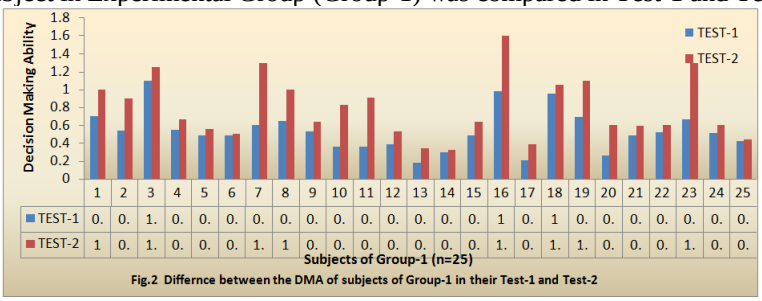

Fig.2 Differnce between the DMA of subjects of Group-1 in their Test-1 and Test-2

A highly significant swing was noticed in the DMA of subjects in Group 1 after completion of the **C**ustomized solutions & training programme. It can further be noticed that no reverse trend erupted. In case of each subject, more or less incline in DMA was witnessed over the period of one year.

STAGE-2

DMA of each subject in Control Group (Group-2) was compared in Test-1 and Test-2

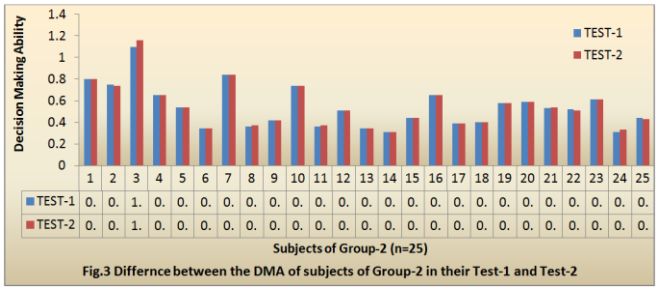

Fig.3 Differnce between the DMA of subjects of Group-2 in their Test-1 and Test-2

It can be observed that having no access to the said programme, there was a little change in figures of DMA of all subjects in Control Group when they were tested twice with a gap of one year.

STAGE-3
DMA of Experimental Group (Group-1) was compared with that of the Control Group (Group-2) in Test-1

Table: 3 Difference in the Mean Standard deviation, standard error, t-values and level of Significance of DMA **between Group-1& Group-2 in T-1**

DMA		MEAN	S.D.	S.E.M	t - value	P-value	Lev. of sig.	
Test-1	G1	0.538	0.2292	0.0458	0.667	0.9474	Not Statically Significant	
	G2	0.5408	0.1955	0.0391				

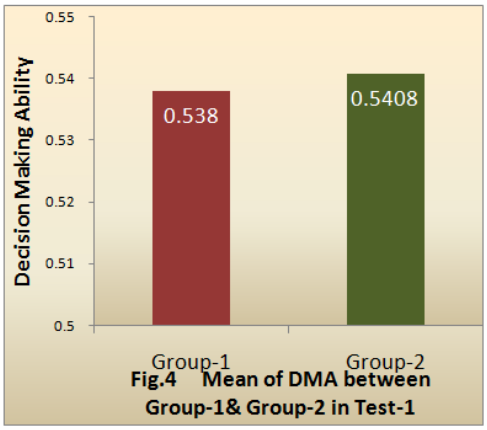

Fig.4 Mean of DMA between Group-1& Group-2 in Test-1

There was found an insignificant difference in the DMAof Experimental Group (Group-1) and Control Group (Group-2) in Test-1. It was witnessed that experimental group had slightly lower mean of DMA as compared to the other group.

STAGE-4
DMA of Control Group (Group-2) was compared in their Test-1 and Test-2

Table 4: Difference in the Mean Standard deviation, standard error, t-values and level of Significance of Test T-1& T-2 of Group-2 in terms of DMA

DMA		MEAN	S.D.	S.E.M	t - value	P-value	Lev. of sig.	
Group-2	T1	0.5408	0.1955	0.0391	1.1893	0.2460	Not Statically Significant	
	T2	0.544	0.2010	0.0402				

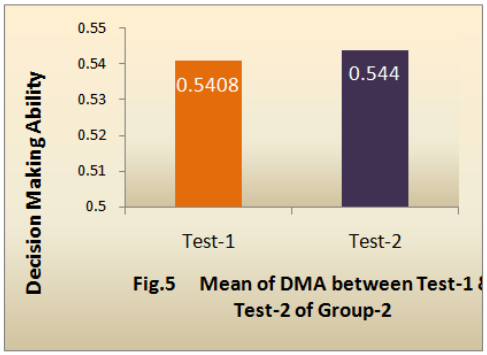

Fig.5 Mean of DMA between Test-1 & Test-2 of Group-2

There was an insignificant difference in the DMAof subjects of Group-2 in Test-1 as compared to their DMA in Test-2.

STAGE-5
DMA of Experimental Group (Group-1) was compared in their Test-1 and Test-2

Table 5: Difference in the Mean Standard deviation, standard error, t-values and level of Significance of

Test T-1& T-2 of Group-1in terms of DMA

DMA		MEAN	S.D.	S.E.M	t - value	P-value	Lev. of sig.	
Group-1	T1	0.538	0.2292	0.0458	5.9622	<0.0001	Extremely Statically Significant	
	T2	0.7872	0.3416	0.0683				

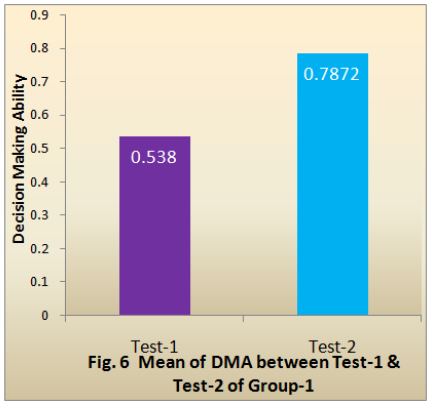

Fig. 6 Mean of DMA between Test-1 & Test-2 of Group-1

DMAof Group-1 was found to be significantly higher in Test-2 as compared to their DMA in Test-1. A dramatic surge was noticed in case of the Experimental Group after the successful completion of the said Programme.

STAGE-6

DMA of Experimental Group (Group-1) was compared with that of the Control Group (Group-2) in Test-2

Table 6: Difference in the Mean Standard deviation, standard error, t-values and level of Significance of DMA**between Group-1& Group-2 in T-2**

DMA		MEAN	S.D.	S.E.M	t - value	P-value	Lev. of sig.	
Test-2	G1	0.7872	0.3416	0.0683	4.454	0.0002	Highly Statically Significant	
	G2	0.544	0.2010	0.0402				

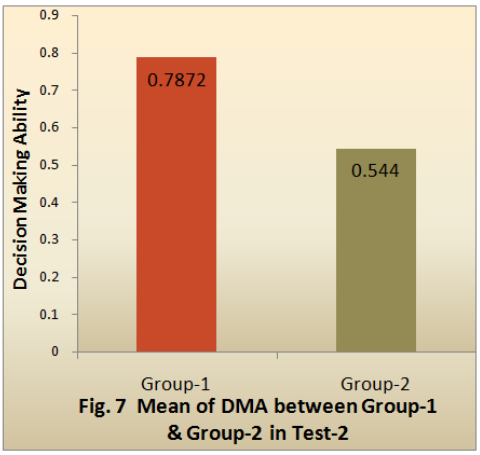

Fig. 7 Mean of DMA between Group-1 & Group-2 in Test-2

DMAof Group-1 was notified to be significantly higher than that of the Group-2 in Test-2. As evident, the DMA of the Experimental Group swung but that of the control group remained almost same.

IV. Conclusion

To recapitulate, after the successful completion of **C**ustomized solutions & training programmefor One Year, it was notified that the Experimental group surpassed their counterparts in terms of Decision Making Ability as that in case of the control group remained almost stagnant over the period of time.

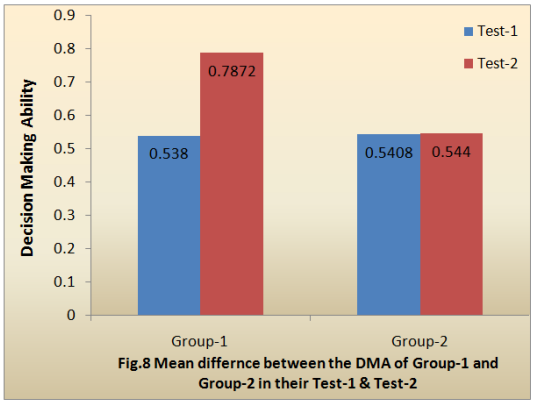

Fig.8 Mean differnce between the DMA of Group-1 and Group-2 in their Test-1 & Test-2

Authorscorroborate that Decision Making Ability in humans has an initial & final value. The desired value lies between these two values. After calibrating the current cognition value, we can work to encompass the desired value. There are certain cognitive ability factors that can be inferred as super sets for complex cognitive functions which can then be reordered by applying customized education methodology. In the contemporaneous research, an extremely significant drift towards higher level of DMA was recorded after the completion of 1 Year of customized solution&trainingprogramme. To wrap up, it can be beheld that DMA of the students can recuperate strikingly if they are provided required training as per their learning style.

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