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EMPIRICAL EVIDENCE OF EFFECTIVENESS OF CUSTOMIZED EDUCATION TRAINING AMONG CHILDREN BASED ON COGNITIVE ABILITY TESTING - A LONGITUDINAL APPROACH

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Abstract

The present quintessential research is an allying paradigm, *aimed to collate the cognitive factors, precisely- Intelligence Quotient, Focus Factor and Decision Making Ability to enhance and amplify learning process among students before and after attending the Customized Training Solutions designed scientifically to ensure a suitable career choice for a meaningful & successful life. There were 469 subjects, male as well as female students between 7-16 years of age who were tested on cognitive ability tests in three phases after attending the customized training solution. It was witnessed that a universal measurement matrix & methodology can help to decipher human cognition &re-orders it to the desired levels. Further, a constant enhancement of all students from their initial levels to their eventual surged levels was noticed in a years' time.*

Keywords: Intelligence Quotient, Focus Factor, Decision Making Ability & Customized Training Solutions (C.T.S).

1. Introduction:

Education connotes erudition that has amuch wider aspect than sole academics. Success awaits those having a balanced blend of cognitive abilities and a passion to work. Children have to become adroit and to be quick decision makers, focused, intelligent, energetic and passionate. Adding value to an individual is a gradual process, which if implemented at right time can do wonders in Career Management. With this view, the authors have intended to design the scientific techniques in the form of customized training solutions for students to enhance their cognitive skills. The education today is content driven and quantitative. To project it to be more qualitative, efforts have to be made to bring innovations and scientifically designed methods to beget career success. Learning process, cognitive abilities & personality of the students can revamp drastically if they are provided required training according to their learning style as per the Theory of Multiple Intelligences by Sir Gardner. Learning process of students depends on their cognitive abilities. We can measure the cognitive abilities of students with the help of cognitive ability tests. The current level of development can be measured & re-ordered to achieve desired elevated levels. To do this, we need to assess their individual learning style & gifted ability so that we can design a task-based customized training solution for them. In the extant research, an extremely significant drift towards higher level of Cognitive Abilities was recorded after the completion of 360 days of customized training solution. In all, research results were estimated for 469 subjects belonging to rural, semi-urban and urban areas. In the study, the subjects were imparted a total of 360 days' customized education training based on cognitive ability worksheets that are designed by eminent researchers, teachers, mentors, educators, counselors and psychologists. Subjects were instructed to complete 2 worksheets daily. After completing 360 days of customized education training, i.e.720 worksheets (CT-1 & CT-2). It was found that there was a remarkable surge in the number of subjects having the higher values for IQ, FF and DMA. It is further notified that the mean value of the IQ, Focus Factor as well as DMA, as assessed in the Test-3 of

these subjects, was much higher as compared to the tests formerly taken, making the statistical difference remarkably high. Thus, it can be concluded that Learning process, cognitive abilities & personality of the students can be reformed significantlyif they are provided required training as per their learning style. When education is delivered keeping in mind the learning style of a student and the curriculum is customized around the gifted ability, it is possible to reorder the core cognitive ability factors. There are certain cognitive ability factors that can be presumed as super sets for complex cognitive functions. These are decision making ability, focus factor along with IQ. All of these can be measured in predefined numerical value system & can be reordered by applying customized education methodology, which is later termed as designing success. All of us are born with a certain cognitive capacity, which is different in different people. Reordering of cognitive abilities is in direct correlation with natural cognitive capacity and learning environment, which is further influenced by early diagnosis of this capacity, action plan, learning style and overall learning process initiated in this direction. It is authenticated that a universal measurement matrix & methodology can help to understand human cognition & to reorder it, to the desired levels. When careers are closely related to one's natural ability & core competence, success is inevitable. Enhancing Core Competence of an individual largely depends on the cognitive abilities and learning style of an individual. Research & analysis reveal that what works for one individual may not work for other in terms of success despite having same qualification and career choice. Guesswork in education & career choice proves lethal to the future prospects of a student. Though passion is the buzzword these days to select and pick a career, but passion alone cannot deliver the goods. Until an individual has a high degree cognitive skill sets, success will always remain elusive & by-chance. A big 'neuro' myth is that a high IQ level or academic intelligence shapes a successful career. The fact is that there are vital cognitive factors that play a more prominent role in shaping our future. There is still a lot to be done to establish concrete outcomes and conclusions in this direction. In today's world knowledge and high Intelligence are not the only factors that determine success. Success requires a focused mind, strong & quick decision making ability, IQ, creativity & early grooming of natural abilities. Measuring cognitive abilities is the first step to achieve all that we dream. Measurement is the process of assigning numerical values to an aspect of phenomenon being studied. As weight can be measured in kilograms, time can be measured in seconds, length in meters and other variables like temperature in degrees: and so can be Human Intelligence. Today we can measure, enhance and reorder cognitive abilities with new scale sets as:-

- To achieve, elevate & reorder anything we need to measure it.
- IQ, Focus, Decision Making Ability are not constant cognitive abilities but are inevitably variable.
- Learning style & Gifted Ability can be identified and nurtured to the highest levels.
- All these factors can enhanced to desired levels with customized education & proper training.
- We can scientifically create successful careers without stress.

Most psychologists believe that cognitive abilities provide most of the explanation for understanding work-task or performance and training outcomes (Schmidt & Hunter, 1998). They also believe that psychosocial factors influence work-task and organizational-citizenship behaviors in different ways, whereas the degree of career-interest influences work commitment and satisfaction. In the psychosocial research

literature, Ackerman and Heggestad (1997) addressed the degree to which intellectual ability, psychosocial factors, and career interests overlap. The important point, though, is that they have been shown to be conceptually and empirically distinct. The traits associated with each construct vary by developmental milestone and criterion. The cognitive skills acquired through academic learning and achievement is foundational and required for success throughout one's school and work career. Some general attitudes and behaviors can help. Likewise, thoughtful post-secondary and work-based choices that match a person's career interests and values contribute to sustained effort and satisfaction. Interestingly, personality attributes have little relationship with measures of cognitive achievement, and their effects are mostly independent of one another. Hence, they can be combined with measures of cognitive achievement when predicting college and work outcomes, resulting in improved prediction. Vocational interests and career development are viewed as separate from personality or psychosocial development, though Ackerman and Heggestad (1997) suggest that there is some overlap in constructs. John Holland (1959) created a hexagonal model of career interests and argued that the degree to which an individual's interest profile fit their career or field of study influenced the person's level of satisfaction and productivity at work. This notion of "person-by-environment fit" was also detailed extensively by Dawes and his colleagues (1984) in A Psychological Theory of Work Adjustment, which argues that a combination of ability and personality are required for work satisfaction. The goal, then, is to maximize person-by-environment fit by encouraging students to choose college majors and occupational paths that commensurate with their interests and academic strengths. A series of studies examined stability and change in career interests and cognitive development over time. The studies found the development of academic achievement and career interests to be independent processes. The studies also showed that measured interests, using a career interest inventory crystallized over the same time period, though students' expressed interest shifted away. These findings have concluded that Career planning must begin early, and students must be helped to stay focused. Too many students with interests in academically demanding fields in science, technology, engineering, and mathematics are not reaching College Readiness Benchmarks. Tracey& Robbins (2006) also examined the relative effects of standardized achievement and career-fit on college outcomes. These findings affirm the validity and importance of effective career planning and decision making within the educational process. In another study, Allen & Robbins examined the degree to which college-major persistence is associated with academic success and career-fit. The degree to which students' measured career interests fit their career choice is directly related to their long-term satisfaction. These positive relationships were found for both males and females, regardless of college major or ultimate educational attainment. As evident, the foundations of our Pyramid for Success remain academic achievement and learning. To promote high school and college readiness, we ought to be prepared to diagnose, remediate and continue to evaluate and align the curriculum with state, college, and workplace readiness standards. To create the proper context for learning, we must understand how psychosocial and career development can facilitate or impede student success beginning in middle school, engage students and their families in a long-term commitment to high school completion and postsecondary success, intervene to motivate students as they struggle with homework compliance, attendance, and remedial work, and create social capital through role modeling, college and work visits, and anything else that highlights or promotes strong work attitudes and their positive payoff. Finally, parents, educators, and counselors can influence the educational and

career aspirations of students positively by following a few basic principles. Research suggests that systematic career education makes a difference. We must begin talking to students about their academic and career interests during elementary and middle school and helpthem to think about the connections between academic course-work, college, and their future career and counsel them to establish goals for acquiring information about careers. Parents have to promote students' college and career planning in school and engage themselves and other significant persons in the lives of students. we must better understand the gaps in career and occupational goals, and between high-demand and priority occupations in an individual state. This strategy helps both students and states to focus on their education-to-work pipeline, identify any gaps between student learning, and college and work-skill expectations, and learning where career aspirations and economic opportunity coincide. Regardless of their socioeconomic status, students would understand this and express strong interest in advanced training. Yet there might remain huge discrepancies in high school and postsecondary completion rates across socioeconomic status. We believe these discrepancies are due in part to a lack of social capital and school-based practices. Thus, we must treat career development as on ongoing process where in students continue to develop and keep the pace to meet the milestones in career guide.

2. Method:

This research is a Purposeful longitudinal study that has been carried out with a random sample size of 469 students. Statistically validated results were put under practice to gather more empirical evidences. Through our work, we found that a universal measurement matrix & methodology can help us serve better in understanding human cognition & to reorder it to the desired levels. In the study, the subjects were imparteda total of 360 days' customized education training based on cognitive ability worksheets designed as per their learning style & gifted ability. Subjects were instructed to complete 2 worksheets daily. After completing 360 days of customized education training i.e.720 worksheets (CT-1 & CT-2).The study is comprised of three phases. Initially Test-1 was conducted on 506 subjects. These subjects were given customized training (CT 1) for 180 days Later, out of them, 485 students appeared for Test-2 after completing 180 days of customized training. Finally, 469 students appeared for Test-3 after attending another 180 days customized training solution (CT 2). So in total, these 469 subjects had taken 360 days' in 2 sessions of 180 days each.

3. Participants:

Subjects included male as well as female students between 7-16 years of age. They were tested on cognitive ability tests in three phases after consecutive 6 months, after attending the customized training solution.

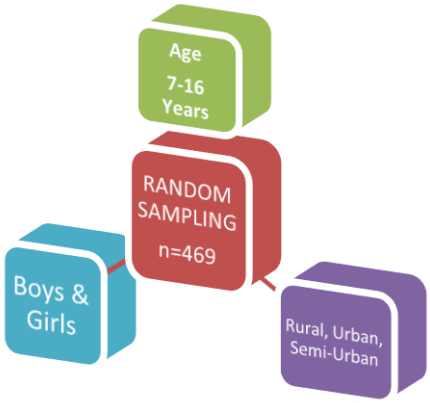

Figure 1: Sampling Procedure

4. Procedure:

The first step included sample selection and then, rapport was formed with the subjects. The subjects were tested thrice.

Phase-1 At initial stage, Test-1 was conducted on a sample of 506 subjects.

Phase-2 In the second phase, 180 days of customized training (CT-1) was provided to the subjects and this was followed by Test-2. (No. of subjects appeared 485)

Phase-3 In the third phase, subjects were given the customized training (CT-2) for another180 days (making a complete 360 days training in 2 phases)Then the testTest-3 were given to the subjects after giving them detailed instructions.

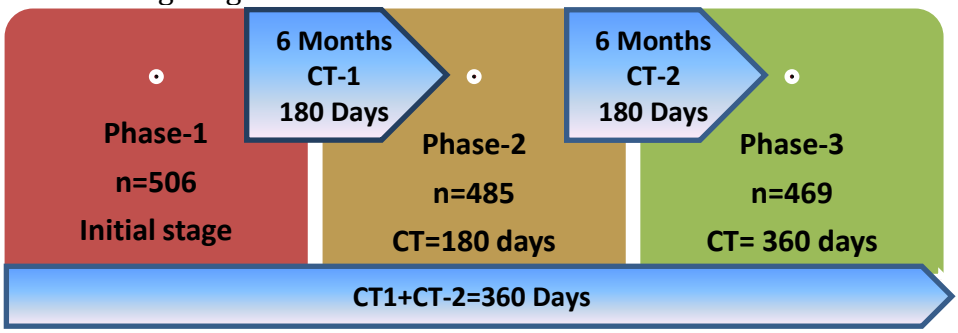

Figure 2: Design of the Research work

5. 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.

Table 1: Statistical tools used for analysis of data

S.No	Statistical Tools	Formula	Purpose
1.	Mean (x)	$X = \Sigma X/N$ where, X = Variable N = No. of sample	To find out the average scores of variable used in the study.
2.	Percentage (%)	% = X/N x 100 where x = Derived score n = total score	To find the distribution of subjects with regard to various variables of the study.
3.	Standard Deviation (S.D.)	$0 = \sqrt{\Sigma x / N}$ Where X = Deviation from actual mean X = mean. X = variable. N = number of samples.	To find out deviation from the man scores of the variables.
4.	Standard error of mean (S.E)	S.E = 0/n Where 0 = S.D, n= number of	To find out the degree to which the mean is affected by the error of measurement and sampling.

		observations	
5.	't' test	$t = (x1-x2) / S \checkmark n1n2/n1 + n2$ 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.

6. Result and Discussion:

Evaluation of Intelligence Quotient:

Table 2: Number of Students according to IQ Range after Test 1, 2 and 3.

IQ	Below 60	60-70	70-89	90-111	111-120	120-150	150-180	180+
Test 1	102	90	137	122	10	8	0	0
Test 2	26	24	90	229	42	49	9	0
Test 3	4	36	81	190	40	73	40	5

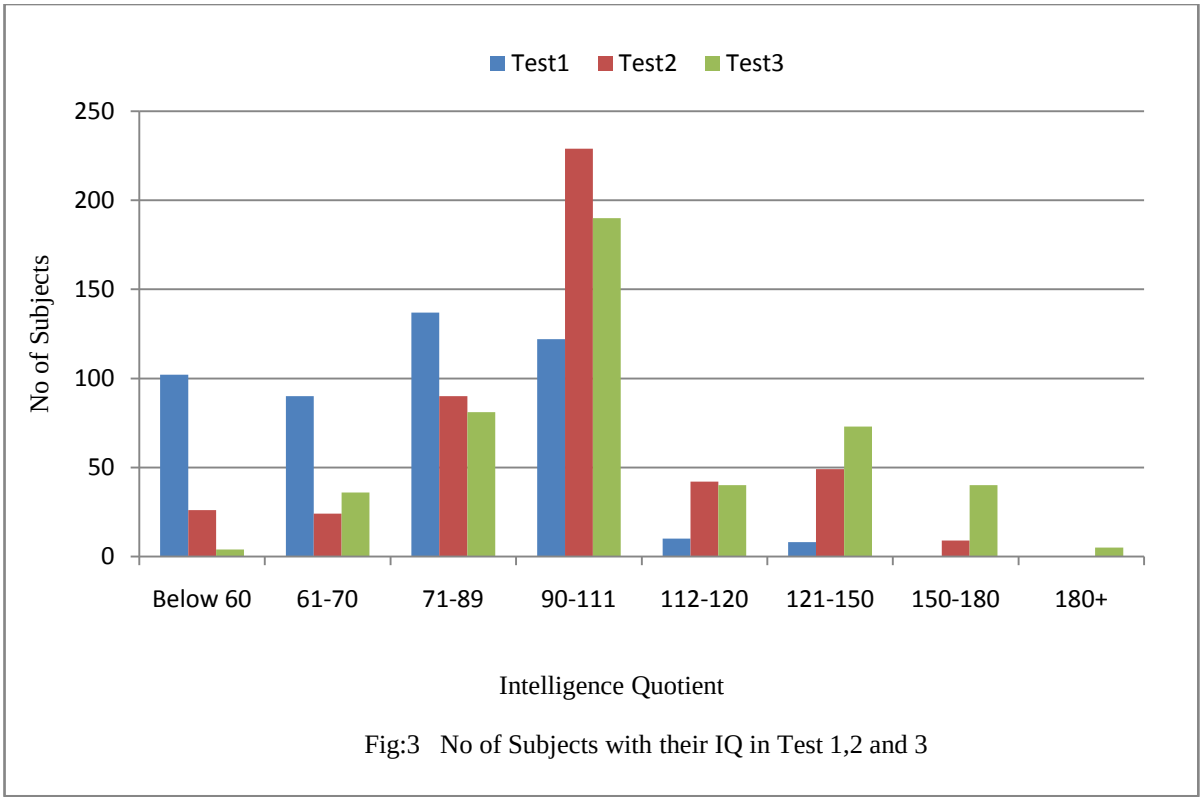

Fig:3 No of Subjects with their IQ in Test 1,2 and 3

It is evident that a gradual soar was witnessed in the number of subjects with higher IQ after attending the customized training solutions whereas a significant dip was notified in the number of subject falling in lower IQ ranges.

Evaluation of Focus Factor:

Table 3: Number of Students according to Focus Factor Range after Test 1,2 and 3.

Focus Factor	Below 30	30-50	51-75	76-90	91-120	121-150	150+
Test 1	56	179	203	29	2		
Test 2	50	125	228	52	10	2	
Test 3	17	7	271	138	30	5	1

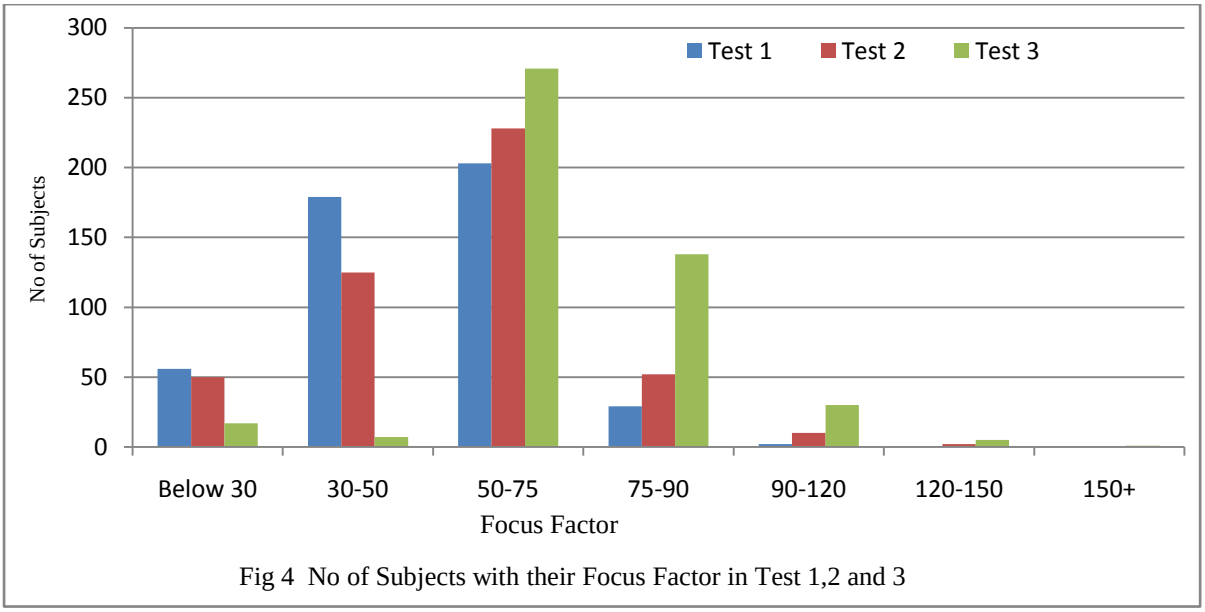

Fig 4 No of Subjects with their Focus Factor in Test 1,2 and 3

It is crystal clear that the number of students falling in desirable and the higher Focus Factor swung up after attending the customized training solutions while an inevitable decline in the number was notified among those falling in the lower focus factor ranges.

Evaluation of Decision Making Ability:

Table 4: Number of Students according to DMA Range after Test 1,2 and 3.

DMA	Below 0.35	0.35-0.50	0.50-0.65	0.65-0.80	0.80-1.0	1-1.4	1.5-1.7	1.7+
Test 1	267	143	31	20	8			
Test 2	200	179	34	20	12	9		
Test 3	33	198	190	10	18	14	6	

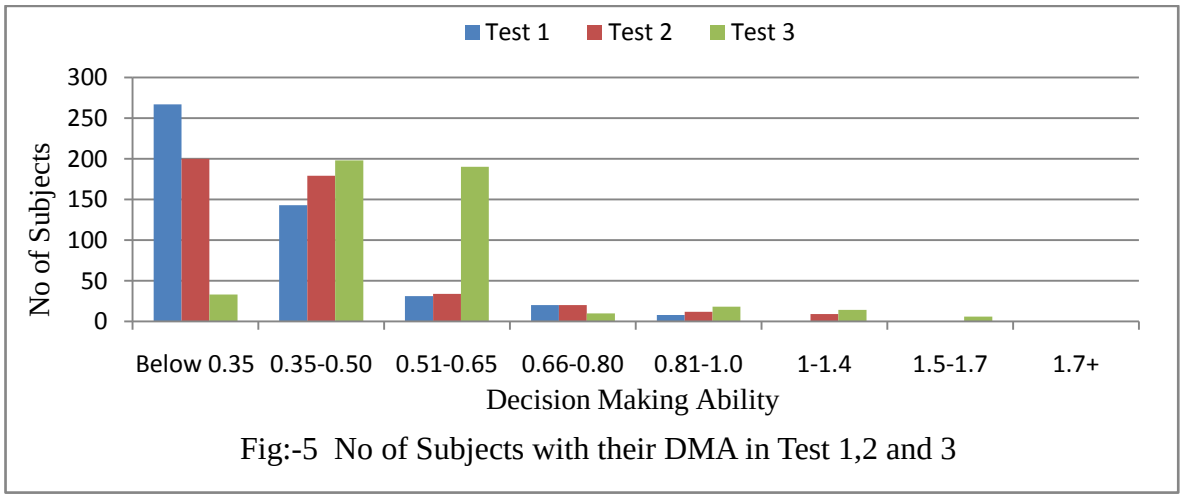

Fig:-5 No of Subjects with their DMA in Test 1,2 and 3

A remarkable amelioration was observed in the Decision Making Ability of subjects after taking customized training solutions. The number of subjects falling in the lower ranges plummeted

Number of Students possessing desired level of IQ, Focus and DMA:

Table 5: Number of Students according to desired level of IQ, Focus and DMA after each test

Desired Level	Test 1	Test 2	Test 3
IQ	8	58	118
Focus Factor	2	12	36
DMA	8	21	38

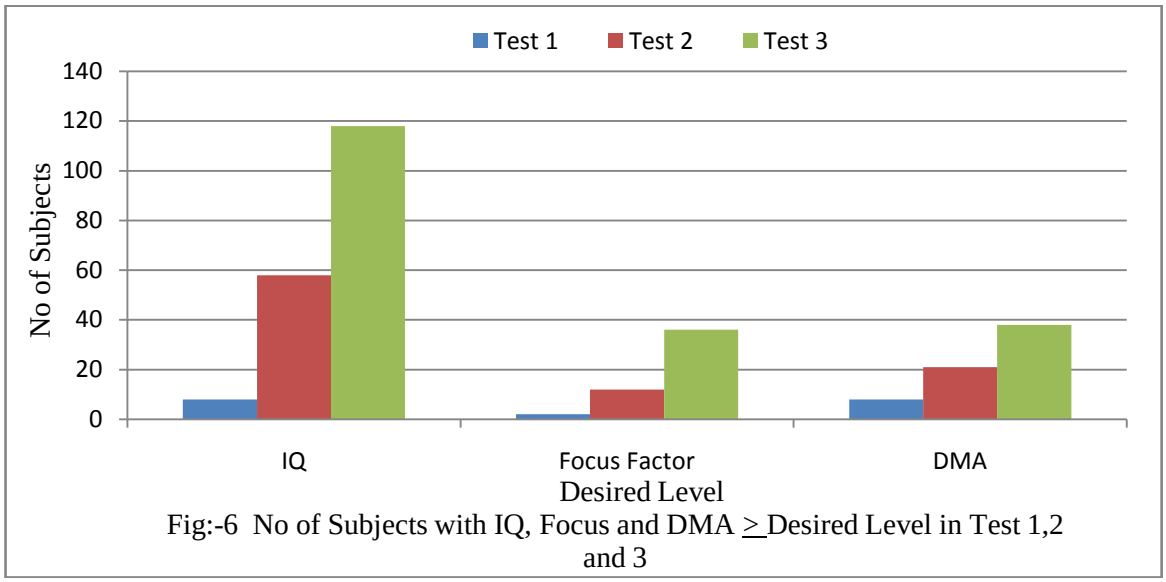

Fig:-6 No of Subjects with IQ, Focus and DMA ≥ Desired Level in Test 1,2 and 3

Certainly, it can be noticed there was a remarkable rise in the number of subjects having at least the desired IQ. As few as 2 of them had at least the desired Focus Factor as assessed in the test 1 while the figure soared by 6 folds after CT-1, later after CT-2 this fig rose as high as 36. In case of DMA, only 8 subjects were notified to have at least the desired DMA, and the figure surged to 38 after CT-2.

Statistical Analysis and level of Significance of Intelligence Quotient:

Table 6: Mean Standard deviation, standard error, t-values and level of Significance of IQ of subjects between Test 1 and Test 2

Test	MEAN	S.D.	S.E.M	**t - value**	**P-value**	**Lev. of sig.**
Test 1	76.15	19.91	0.92	84.8477	<0.0001	Extremely Statistically Significant
Test 2	97.87	21.64	1.00			

Table 7: Mean Standard deviation, standard error, t-values and level of Significance of IQ of subjects between Test 1 and Test 3

Test	Mean	S.D.	S.E.M	**t - value**	**P-value**	**Lev. of sig.**
Test 1	76.15	19.91	0.92	59.2333	<0.0001	Extremely Statistically Significant
Test 3	107.31	28.52	1.32			

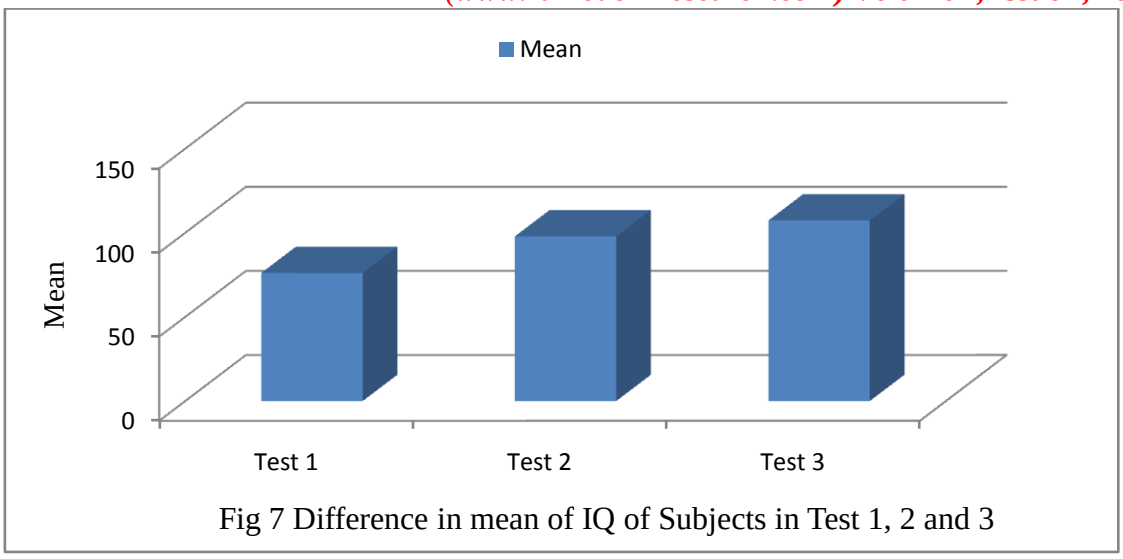

Fig 7 Difference in mean of IQ of Subjects in Test 1, 2 and 3

It is witnessed that there was significantly high statistical difference in the mean value of IQ of the subjects as assessed through them test 1 and test 3, the IQ in the latter case being at a much as higher end.

Statistical Analysis and level of Significance of Focus Factor:

Table 8: Mean, Standard deviation, standard error, t-values and level of Significance of FF of subjects between Test 1 and Test 2

TEST	MEAN	S.D.	S.E.M	**t - value**	**P-value**	**Lev. of sig.**
Test 1	49.8570	14.7251	0.6799	49.2475	<0.0001	extremely statistically significant
Test 2	56.0328	16.9327	0.7819			

Table 9: Mean, Standard deviation, standard error, t-values and level of Significance of FF of subjects between Test 1 and Test 3

TEST	MEAN	S.D.	S.E.M	**t - value**	**P-value**	**Lev. of sig.**
Test 1	49.8570	14.7251	0.6799	73.5359	<0.0001	extremely statistically significant
Test 3	72.0010	15.6769	0.7239			

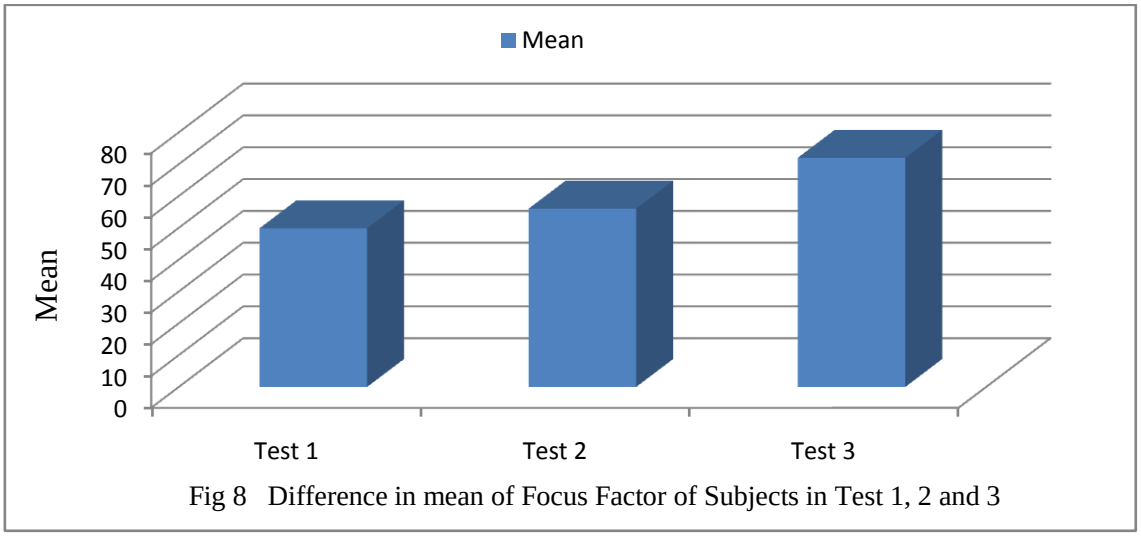

Fig 8 Difference in mean of Focus Factor of Subjects in Test 1, 2 and 3

It is further notified that the mean value of the Focus Factor as assessed in the test 3 of these subjects was much higher as compared to the tests formerly taken making the statistical difference remarkably high.

Statistical Analysis and level of Significance of Decision Making Ability:

Table 10:Mean, Standard deviation, standard error, t-values and level of Significance of DMA of subjects between Test 1 and Test 2

TEST	MEAN	S.D.	S.E.M	t - value	P-value	Lev. of sig.
Test 1	0.3367	0.1060	0.0049	21.4703	<0.0001	extremely statistically significant
Test 2	0.3834	0.1421	0.0066			

Table 11: Mean, Standard deviation, standard error, t-values and level of Significance of DMA of subjects between Test 1 and Test 3

TEST	MEAN	S.D.	S.E.M	t - value	P-value	Lev. of sig.
Test 1	0.3367	0.1060	0.0049	30.6933	<0.0001	extremely statistically significant
Test 3	0.5389	0.2176	0.0100			

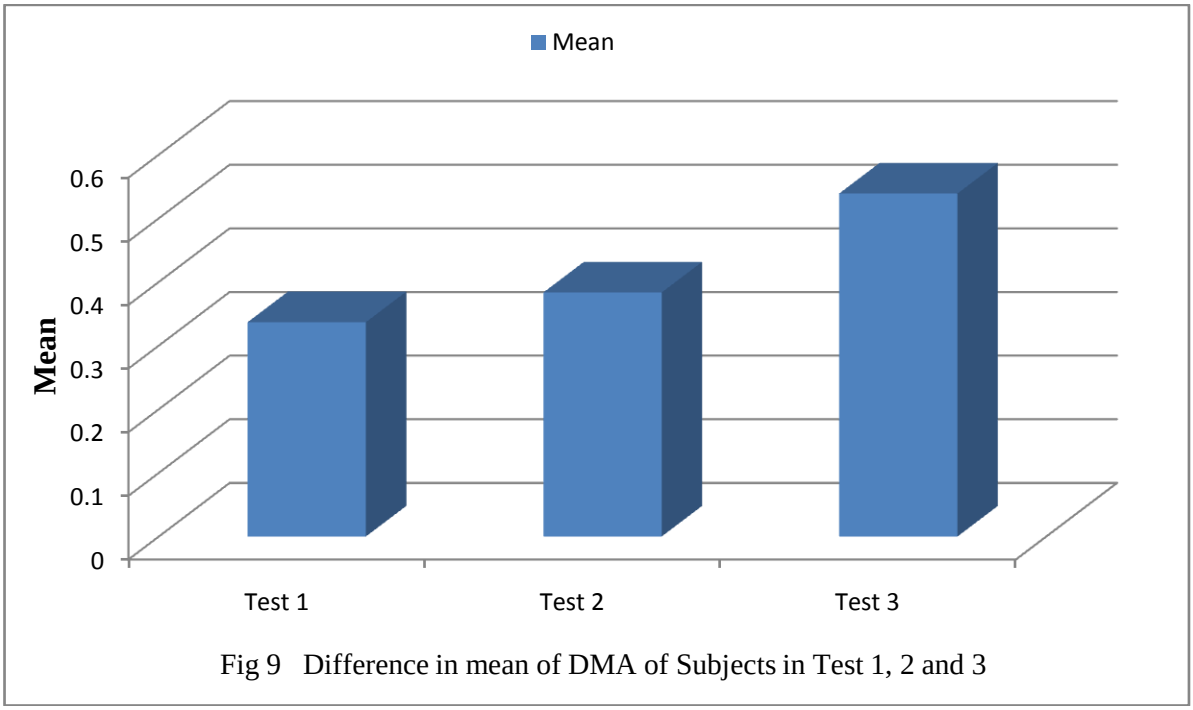

Fig 9 Difference in mean of DMA of Subjects in Test 1, 2 and 3

Moreover it is noticed that there was a drastic difference in the mean value of DMA of the subjects as assessed in test 1 and test 3, the former one bearing no less than a trough.

7. Conclusion:

In a nutshell, the authors corroborate that Cognition and cognitive abilities in humans have 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. Inthe contemporaneous research, an extremely significant drift

towards higher level of Cognitive Abilities was recorded after the completion of 360 days of customized training solution. It was contemplated that there had been a phenomenal surge in the number of subjects having the higher values for IQ, FF and DMA. It is further ascertained that the mean value of the IQ, Focus Factor as well as DMA, as assessed in test-3 of these subjects, surpassedtheir figures in the tests formerly taken, making the statistical difference conspicuously high. To wrap up, it can be beheld that Learning process, Cognitive abilities &Personality of the students can recuperate strikingly if they are provided required training as per their learning style.

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