

THE EFFECT OF TECHNOLOGICAL ACADEMIC GRIT INTERVENTIONS TO IMPROVE PROSPECTIVE TEACHER'S BOTANY LEARNING

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ABSTRACT

The academic grit practices involve student teachers to make perennial learning process, self-reliant of their abilities, preserve their skills even at the time of difficulties at later stages of life, interest over time to attain academic progress. This assertion proposed the present investigation in which 90 student teachers were selected by purposive sample from IGNTU (Indira Gandhi National Tribal University), Amarkantak, M.P (Madhya Pradesh), India and results showed that the process sigma in the learning deficiencies are lesser in the experimental group (1.68) than the traditional group (1.53) and control group (1.22). The mean of Defects per Million Opportunities (DPMO) value is lesser in the experimental group (270000) than traditional learning group (396000) and control group (640666) in achievement test. The academic yield was more in the experimental group student teachers (73) than the traditional (60.4) and control group student teachers (35.9). Further control chart showed defects limit for Academic grit group – 12.5 % for traditional group student teachers – 21.2% and for control group – 24.7%.

Keywords

Academic Grit Interventions, Prospective teachers, Botany learning

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Introduction

The revitalised interest on the quality perspectives of the teacher education in India has been impelled as it is the mother of all education. Correspondingly, the modern Academic Grit practices are to be encompassed in the transactional process as it overlays the way to overcome academic constraints and makes the tangible mind sets with the strong sense of revamping tribal education system in India.

The prime objective of academic system is to preserve learning capability and stronger mind-set of the learners even in the unmanageable spheres of life situations which may be ambiguous to the cognitive ability of a person. The self – regulative person can modify the difficulties in to productive sphere of life. The able minded practices are to be constantly framed for the student teachers of tribal areas as the tribal setting in India are far from the reach of fruitful gains of Globalisation and Neo economical world order of the rest of the regions. Further, it is noted that the student teachers of these localities possess reduced self-efficacy, self-restrain from the disagreeable situations and exhibit lack of responsibilities and build a weak responsibility to undertake goals, small-mindedness on hitches. Subsequently the current

study has taken with higher effort on the raising socio -motivational learning of the student teachers.

Education system for the tribal

It is reflectively significant to adopt the trust worthy educative process to the tribal students as an egalitarian principle to assert the academic equity that paves the way to positive societal transformation with national considerations. To promote the tribes and tribal education, the national and international indigenous organisations strive hard. This resulted in focusing the tribal issues and needs specifically from 1995 to 2004. It was created to accomplish orderly practices to emphasis on the hitches the tribal folks. Being embarked unceasingly on these conventions, it is remarkably stated that the qualitative expansion of tribal education system provided in our country revoke the any mismatched present day educative process of the tribal students. Similarly, this current study also envisages the special attention on the influential factors of learnability of student teachers hailing from inaccessible areas of Madhya Pradesh, India.

Academic Grit practices for the student teachers

As the student teachers require the strong mind set to attain the goals of life, the various grit practices

are adopted in this study. Furthermore, grit is defined as Stronger sense in the face of difficulties and setbacks, perseverance to achieve long-term or higher order goals, commitment of the psychological empowerment, profound academic mind-sets, effortful regulation, and strategic planning (Shechtman, DeBarger, Dornsife, Rosier and Yarnall, 2013, p.15).

The consistent sense of achieving in life directly depends on self-efficacy practices, self-regulation and social learning. Notably, these characteristics unambiguously enhance academic interest and make the real learning. Comprehensively, these are incorporated in this study to make the student teachers to learn botanical concepts which fulfils their academic requirement. Associated with this aspects, the learning environment is created as more conducive to sustain the learning process along with academic grit principles noted above.

The lowest academic persistence exists among the student teachers as they encounter the lack of basic amenities, distant sub rural locality, and provision of poor health facilities endorsed with inaccessible government schemes. Hence this study is carried out to measure their academic performance level along with academic grit quality.

These collective activities are provided to make student teachers to learn plant sciences optimally. Similarly, This educative process bring strong mind set in the midst of untold stumbling blocks and they also develop consistency to learn and experts from various fields are invited to provide various encouraging informations to student teachers who need to be strongly decisive.

Additionally, the prevailing academic process must be aimed at the quality perspective and the crucial consideration is to be laid upon:

1. Quality life of the future students by academic grit approach based practices.
2. Preservation of valuable cultural, ethical, social and medicinal system that the tribal

societies have conventionally bestowed to our nation.

3. The upbringing the tribal masses on par national expectation and developments.

The importance of this study is much realised for the reason that among the oldest civilization, India is the best known for its rich repository of flora and fauna, which are used as drugs and cosmetics. Indian medical system is inclusive of Ayurveda, Unani and siddha. Moreover, the knowledge of plant science will help in sustaining good physiques young and fresh. So learning botany is essential for student teachers to transact the botanical concepts for the young minds in their schools.

For this purpose, The ICT based technological interventions were essentially adopted to render efficient programs on Academic Grit practices as well as on Botany learning which comprises the cultural, social, environmental and lingual perspectives of the individual learner belongs to tribal life. Additionally, to analyse the effect quality learning outcome, the six sigma method was employed in this research.

Six sigma academic Research

According to Hari Haran & Mohanasundaram (2013), the six sigma research is intensively performed in industrial sector and very fewer studies were conducted in the academics.

It is also reasonably stated that the academic six sigma analysis are systematic and versatile framework to achieve, preserve and optimize the outcome of the process through the implementation of societal needs, the effective use of realities, the principles of quality assurance and the achievement of goals through effortful consideration to handle, strengthen and reinvent the learning process (Hari Haran & Mohanasundaram, 2013). This six sigma DMAIC method is mentioned in figure 1.

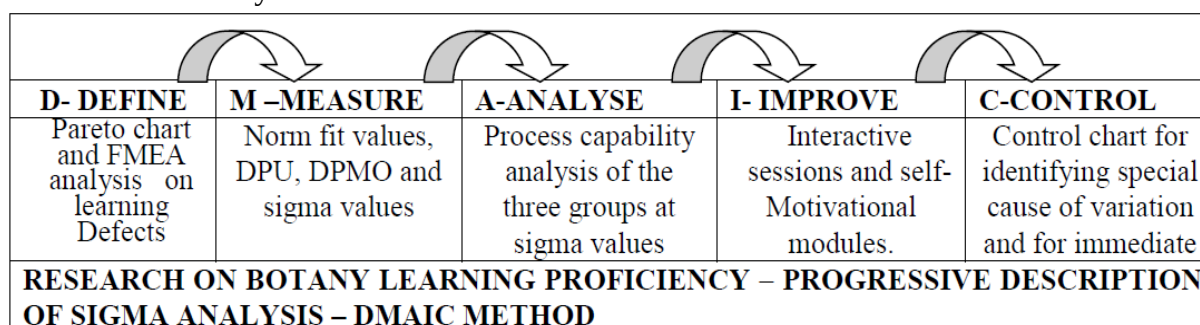


Figure – 1: Showing the DMAIC approach

Since the student teachers are hailing from far stretched tribal areas, the learning capability on different concepts of botany is not optimum. So in this research, six sigma based analytical tools like Pareto chart and FMEA were used to identify the

various governing factors of educative process encountered by student teachers.

Pareto chart and Research problem identification

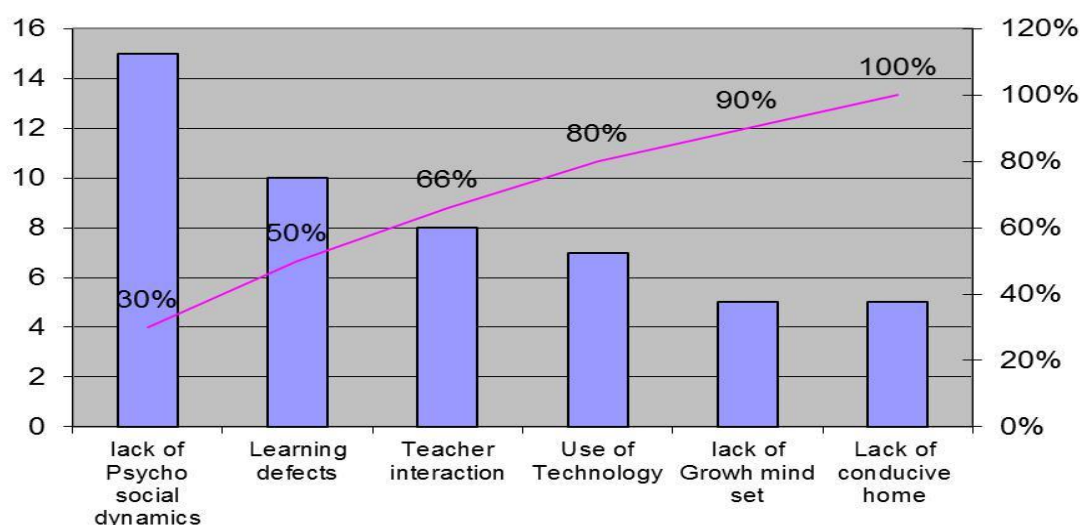


Figure – 2: Showing the problem identification in the Pareto chart

The Pareto chart is one of six sigma tool to identify the major problems in the industrial units and is used to comprehend the 20 % of defective factors creates 80 % problems. The present study confirms the following are the 20 % causative defects that create 80% academic problems as in the figure 2. It is portrayed that deficient schooling system provides the poor language ability of the student teachers as of the following:

1. Lack of Academic Growth Mind set because of poor schooling system
2. Lack of Home climate located in the remote hamlets to enhance quality learning
3. Lack of use of technology in their respective schools. These are evidently hampering quality learning process. Researchers have focused upon the problems related to the academic grit practices.

The dearth of the botany learning due to lack of English knowledge which is primarily noted as the major hindrance among student teachers. The linguistic ability is also much needed in the modern times as all the learning materials are available only in English to learn botany. Remarkably, present day system without academic grit practices reflects lacuna in botany learning process as the various psycho – social learning factors hinder the quality learning process inside the classrooms. Considering these view points, the present study was conducted.

Essentially, as the student teachers are future of Indian schools, it is the crux to learn botany and to realise its importance in the present scenario. In addition, among States, the highest number of Scheduled Tribe Students is in Madhya Pradesh where the traditional tribal medical practices are still undertaken. Hence the efforts are taken on the outstanding transactional process with technology based academic grit practices towards botany learning

Current investigation by (FMEA)

The term FMEA (Failure Mode and Effects Analysis) was coined in 1949 by the US Armed Forces for detecting and eradicating the defects in the materials and in the process. The safety of personnel and material was the prime objective the FMEA.

Besides this, The FMEA seeks to classify all potential failures, their effects on the system, the severity and likelihood and the possibility that the malfunction will go unchecked (Pyzdek, 2010).

Moreover, In the Apollo space program, the FMEA was adopted to eliminate risk due to inadequate sample sizes and thus FMEA was adopted more during 1960s, with the desire to placing a man on the moon and intern return safely back to Earth (Carlson ,2014). This present study, FMEA analytical process was employed to ascertain the Risk value (R) on Botany learning deficiencies.

Based on Pareto chart and FMEA, the noticeable evident reports were noted by the student teachers,

school teachers and by the faculty of Education, IGNTU, Amarkantak,

Table: 1 - The FMEA on learning by student teachers in the inaccessible Tribal settings

Mode of failure	Effect of failure	S.I	Causes of failure	O	Controls	D	R	Recommended action
Undesirable attainment in botany learning	Lack of learning attainments and stronger mind sets	7	Lack of dynamic ability in moulding with stronger mind sets of future teachers	8	Periodical inspection of authorities	8	448	Adapting Constant and resourceful academic grit practices
			Lack of resource facility in sub rural home setting	7	Periodical visit of local government authorities	3	147	Creating infrastructural facilities
			Poor learning practices	6	Effective monitoring	6	252	Implementation of suitable strategies to Improve the quality learning
			Lack of skill training	6	Constant Academic engagement with feedback	4	168	Providing motivational programs and self involved practices
			Reluctance for self and continuous evaluation	4	Effective Monitoring	4	112	Providing motivational programs
			Inadequate disciplined practices	8	Effective monitoring	6	336	Continuous and comprehensive assessment
			Lack of basic sub rural amenities	4	Efficient fund Management system	4	112	Effective monitoring and assessment system of government officials

Responsibility is devoted by the Dean, Teachers and students

(S.I – Severity Index; O – opportunity; D – Detection possibility; R- Risk priority number) $R = SI \times O \times D$

By this FMEA the investigators have analysed the existence of organisational failures in all the four schools where the intensive teaching program are conducted. The R value is higher in the all institutions where the immediate attention is required. As a cautionary result, the FMEA sustains the effectiveness of the prospective teachers' knowledge, skills and attitudes towards ascertaining plant sciences.

FMEA based prominent assertion of the current study

As a part of intensive teaching program conducted on these schools in the previous years, the

teachers of Department of Education as well as the student teachers observed the following academic constraints of quality sustenance of these schools. It is impeccable that these constraints will hinder not only the academic growth but also the whole life career.

- Since the schools are dependent on the quality student teachers, it is needed to focus on the academic practices of teacher education and the quality learning will be the boon to the university system of IGNTU, Amarkantak.

- Low self – efficacy of the student teachers tribal will be hinder their physical as well as the

moral system of their social life, personal life and teaching in their respective schools.

- The stronger psychological fixation of the tribal students towards botany learning is essence of academic perseverance and academic grit practices.

The projection of this work analysed the above stipulated view points and hence the prominence of this research work will be elimination of quality constraints.

The Research Variables

The Independent Variable of the study is encompassed of academic grit based teaching strategy along with ICT content on botanical concepts. The dependent variables are the learning deficiencies and achievement test.

Methods

The study adopts the Six Sigma based Experimental study. It analyses English learning deficiencies of the Student teachers, the effectiveness the technology based academic grit interventions and the ICT based English content transactions. The six sigma analysis includes existing learning deficiencies-sigma values, percentage of Rolled through Put Yield (RTY).

Population and Sampling

The population comprises the student teachers studying at IGNTU, Amarkantak, Anuppur district of Madhya Pradesh, India.

90 Student teachers from IGNTU, Amarkantak, M. P, India were taken as purposive sample. The student teachers of the Traditional learning group were selected from the 2016 -17 academic year. The experimental group were selected from the

VIII semester 2017 -18 batch and control group VIII semester student teachers of IGNTU 2018-19 academic year.

Tools of Research

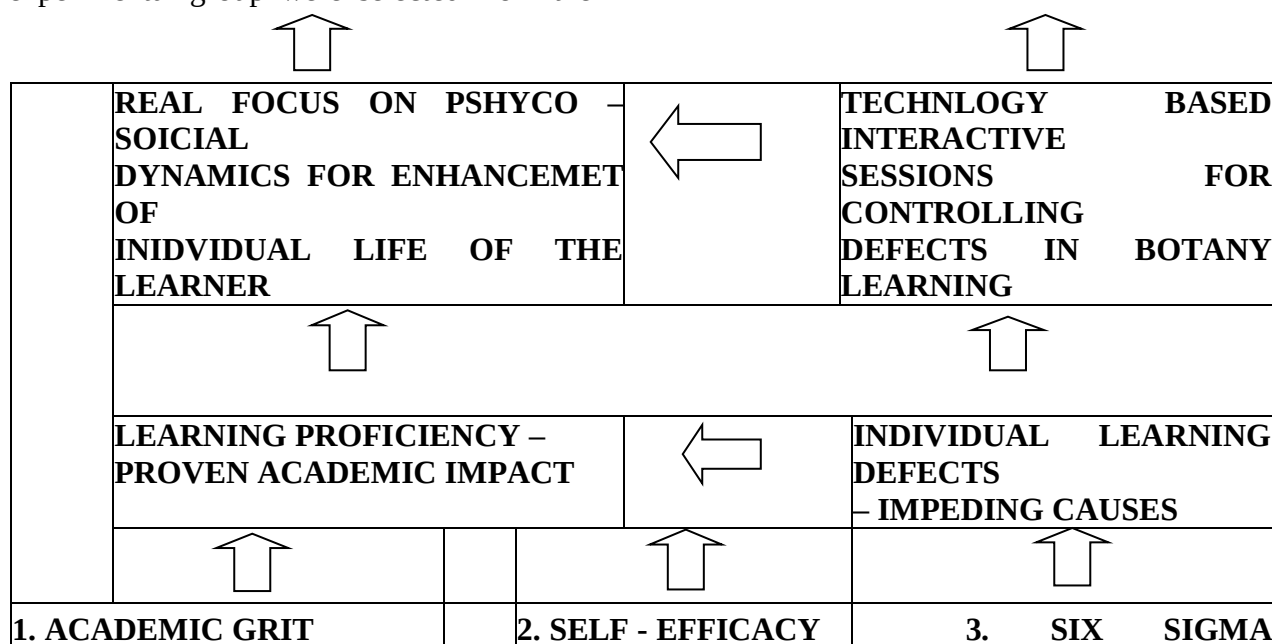
The following tools will be constructed and standardised by the investigators

1. Academic Grit Tool (AGT) – self – prepared tool based on the declarative affirmations of the UNESCO. It is constructed and standardised as per the need. The tool has validity value of 0.81 and reliability value 0.76.
2. Modified Learning deficiency scale (LDS) – constructed and validated by Hariharan and Mohanasundaram, 2013.
3. Achievement test – standardised by the investigators. The tool has validity value of 0.79 and reliability value 0.72
4. E content based Botany transactional process.

Research process – I - Academic Grit interventions

Based on UNESCO report on Global Education Monitoring 2016 the dimentions of Academic Grit practices was used to implement academic Grit practices for learning Botany through English and the details of its implementation is in figure 3.

QUALITY ATTAINMENT IN BOTANY LEARNING WITH HIGHER ORDER COMPLIANCE TO MAKE THE STUDNT TEACHER MORE COMPATIBLE TOWARDS NATURE



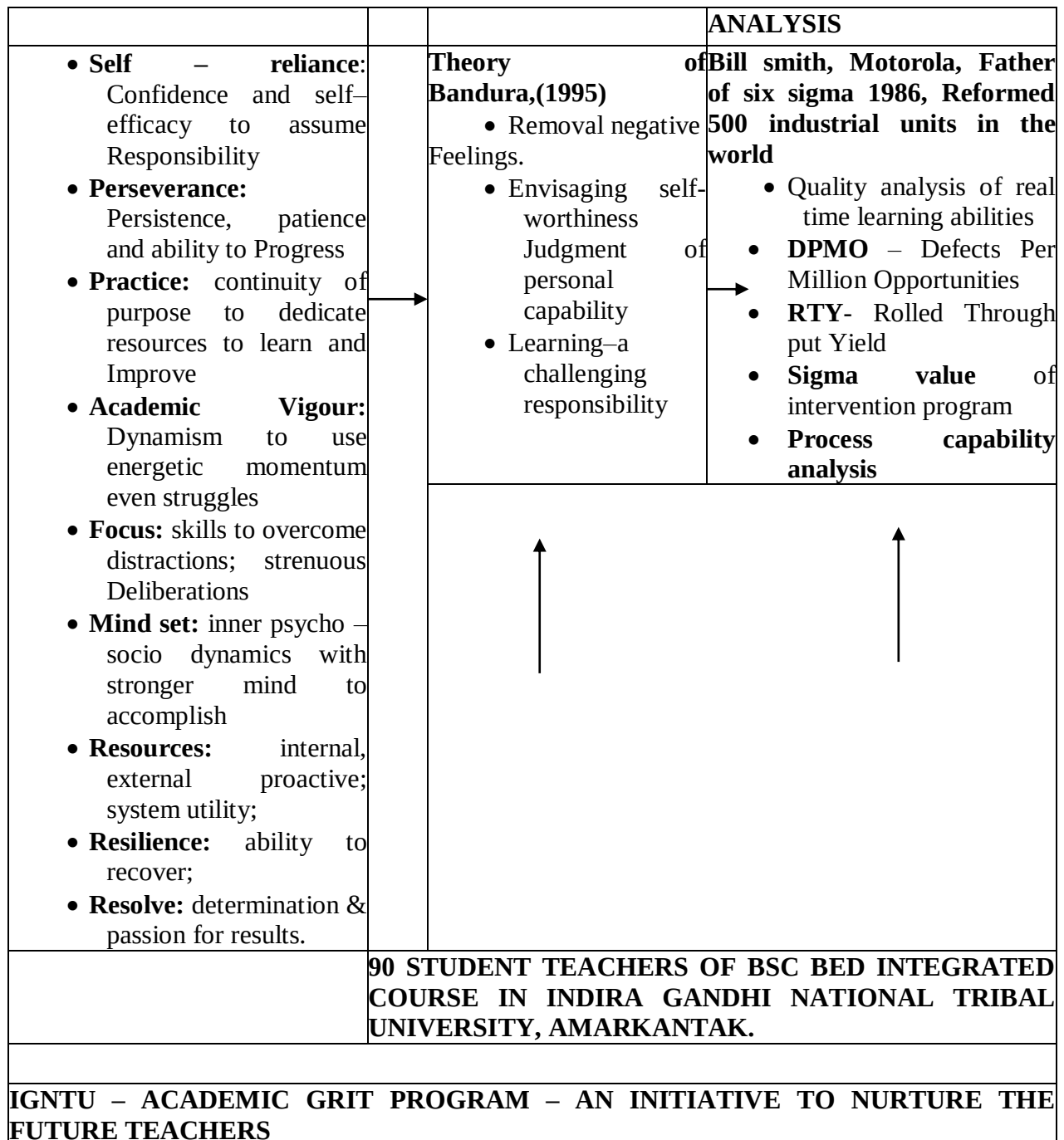


Figure – 3: showing the schema of the academic grit practices and six sigma research

Table–2: Research process – II: Implementation of self-efficacy module as an Academic grit Intervention

Sl. No.	Self-efficacy practices (Bandura, 1995)	Description of this research conducted in the deprived tribal setting
1.	Mastery experiences	Self – Reflective practices with technology based story board and conducive interactive sessions in tribal setting
2.	Vicarious experiences	Live interaction with elite personalities of the society articulated with the technology to enhance the learning skills
3	Social persuasion	The social enrichment programs conducted for attaining desired goal and to alienate deprived conditions of life.
4	Physiological and emotional state	The student teachers are constantly encouraged for the better emotional well beings as they are the future teachers.

Research process – III – transactional process

Preparation of botany learning - E content (story board, interactive videos, digital imageries, descriptive slides and Pdf files); E- Content - Syllabus frame work - Tribal Medicinal plants; its components and uses; plant physiology – Kerb cycle and Glycolysis. The influential factors pertained in these research process are analysed as in the following sections.

Results and discussions**Table 3 – Showing the Sigma value of learning deficiency factors of the three groups**

Sl. No	Learning Deficiency factors	Factor Mean			Norm fit value			Defects Per Million Opportunities (DPMO)			Sigma Value ((One opportunity))		
		CG	TG	EG	CG	TG	EG	CG	TG	EG	CG	TG	EG
1	Unable to differ Essential data, facts, figures in botany	63.4	44.3	33.4	0.634	0.443	0.34	634000	444000	334000	1.16	1.64	1.93
2	Poor Grasping of terminology	60.5	38.9	35.4	0.605	0.389	0.354	605000	389000	354000	1.23	1.78	1.87
3	Wrong specific responses	64.4	55.2	40.1	0.644	0.552	0.401	644000	552000	401000	1.13	1.37	1.75
4	Tendency of skipping the content passages Figures tables etc.	58.5	50.1	40.6	0.585	0.501	0.406	585000	501000	406000	1.29	1.37	1.74
5	Poor frequency of using library	57.1	47.2	36.5	0.571	0.472	0.365	571000	472000	365000	1.32	1.57	1.85
6	Unable to recall important points after reading	69.6	45.9	30.3	0.696	0.459	0.303	696000	459000	303000	0.99	1.6	2.02
7	Difficult in rapid notes preparation while teaching is on	49.8	43.9	38.8	0.498	0.439	0.388	498000	439000	388000	1.51	1.65	1.78
8	Unclear verbal uses	58.7	50.7	40.6	0.587	0.507	0.406	587000	507000	406000	1.28	1.48	1.74
9	Problems of Describing events / Objects	66.8	49.8	41.8	0.668	0.498	0.418	668000	498000	418000	1.07	1.51	1.71
10	Untidy written work	55.7	46.4	35.8	0.557	0.464	0.358	557000	464000	358000	1.36	1.59	1.86
11	Dislikes/Avoids written work in the class room	65.5	53.4	44.7	0.655	0.534	0.447	655000	534000	447000	1.1	1.41	1.63
12	Only making glance of reading material	60.5	52.7	42.7	0.605	0.527	0.427	605000	527000	427000	1.23	1.43	1.68
								608750	482166	383916	1.22	1.53	1.68

CG – control group ; TG –Traditional teaching group; EG – Experimental group

The six sigma calculations are made to analyse the process yield of both academic grit interventions and the achievement test score of the three groups.

The prominent assumption is that substantial evident of non-significant difference between the three groups on learning deficiency factors in terms of Defect per Million opportunities (DPMO) and sigma values.

The sigma analysis of process of yield of both academic grit interventions and the achievement test score in the learning deficiencies is lesser in the experimental group (1.68) than the traditional group (1.53) and control group (1.22). So the presence of significant difference between the three groups is an evident to reject the above mentioned assumption. Hence it is depicted that the E-Content based content gain the momentum to attain the desired goal.

This study is obviously revealing that relevance of Six Sigma techniques can be highly beneficial in ascertaining the insufficiencies in learning the botanical science concepts as cited in the findings of Nagi & Charmonman (2010) that the technique of Six Sigma will facilitate in measuring the reasons for lack of progress during the course of studies and provide a consistent identification of educational problems.

Table 4 – Showing the sigma values of the Academic grit elements of the student trainees in the three groups

Sl. No	Academic grit	Factor Mean			Norm fit value			Defects Per Million Opportunities (DPMO)			Sigma Value ((One opportunity))		
		CG	TG	EG	CG	TG	EG	CG	TG	EG	CG	TG	EG
1	I continually thrive to resolve problematic obstructions if I work hard.	49.8	44.8	36.8	0.498	0.448	0.368	498000	448000	368000	1.51	1.63	1.84
2	I use my time to recognize lifelong aims.	52.5	46.3	38.3	0.525	0.463	0.383	525000	463000	383000	1.44	1.59	1.80
3	I can live for my aims.	66.1	41.1	29.1	0.661	0.411	0.291	661000	411000	291000	1.08	1.72	2.05
4	I can achieve what I deserve.	53.7	52.4	39.4	0.537	0.524	0.394	537000	524000	394000	1.41	1.44	1.77
5	I take self responsibility.	48.4		29.8	0.484	0.417	0.298	484000	417000	298000	1.54	1.71	2.03
6	I can work in difficult situations.	59.7	38.5	29.8	0.597	0.385	0.298	597000	385000	298000	1.25	1.79	2.03
7	I am directed by my own values.	57.9	53.7	26.3	0.579	0.537	0.263	579000	537000	263000	1.3	1.41	2.13
8	I am capable of learning in all situations.	59.7	56.6	35.6	0.597	0.566	0.356	597000	566000	356000	1.25	1.33	1.87
9	I have important Life purposes.	62.9	49.2	31.2	0.629	0.492	0.312	629000	492000	312000	1.17	1.52	1.99
10	I choose my own activities.	51.4	44.9	27.9	0.514	0.449	0.279	514000	449000	279000	1.46	1.63	2.09
11	I can motivate myself.	66.1	62.3	33.3	0.661	0.623	0.333	661000	623000	333000	1.08	1.19	1.93
12	I commit mistakes Without constructive system of mind.	58.3	53.4	41.4	0.583	0.534	0.414	583000	534000	414000	1.29	1.41	1.72
13	I learn from my failures.	55.2	50.1	34.1	0.552	0.501	0.341	552000	501000	341000	1.37	1.5	1.91
14	I know my	49.7	46.4	44.4	0.497	0.464	0.444	497000	464000	444000	1.51	1.59	1.64

	behavioural changes.												
15	I feel healthier on competition.	54.9	52.5	37.2	0.549	0.525	0.372	549000	525000	372000	1.38	1.44	1.83
16	I feel worthy.	57.8	53.6	45.6	0.578	0.536	0.456	578000	536000	456000	1.3	1.41	1.61
17	I am interested in deeper learning.	54.6	50.7	40.7	0.546	0.507	0.407	546000	507000	407000	1.38	1.48	1.74
18	I divert my ideas frequently.	64.8	47.8	37.8	0.648	0.478	0.378	648000	478000	378000	1.12	1.56	1.81
19	I frequently change my interest.	52.6	51.9	24.9	0.526	0.519	0.249	526000	519000	249000	1.43	1.45	2.18
20	I fail to focus on my work.	68.1	45.8	36.8	0.681	0.458	0.368	681000	458000	368000	1.03	1.61	1.84
21	I cannot face challenges.	53.8	51.6	41.5	0.538	0.516	0.415	538000	516000	415000	1.4	1.46	1.71
22	My failures bring disappointments.	49.9	49.7	39.7	0.499	0.497	0.397	499000	497000	397000	1.5	1.51	1.76
								567227	493181	355272	1.32	1.51	1.87
CG – control group ; TG –Traditional teaching group; EG – Experimental group													

The student teachers of experimental group taught by ICT based method have remarkably adopted the academic grit practices. It is also noted that the sigma value of Academic grit interventions experimental group (1.87) differ significantly with

the traditional group (1.51) and control group (1.32).

To measure the DPMO values (Defects per Million opportunities), sigma mean of achievement test score and percentage yield values.

Table 5 –showing the Sigma values in Achievement in botany in the three groups

Sl. No	Defective score			Defects Per Unit (DPU)			Defects Per Million Opportunities (DPMO)			Sigma Value ((One opportunity)		
	CG	TG	EG	CG	TG	EG	CG	TG	EG	CG	TG	EG
1	40	28	12	0.8	0.56	0.24	800000	560000	240000	0.65	1.35	2.21
2	37	21	13	0.74	0.42	0.26	740000	420000	260000	0.86	1.7	2.14
3	29	17	10	0.58	0.34	0.2	580000	340000	200000	1.3	1.91	2.34
4	29	26	9	0.58	0.52	0.18	580000	520000	180000	1.3	1.45	2.42
5	25	19	21	0.5	0.38	0.42	500000	380000	420000	1.5	1.81	1.7
6	36	16	11	0.72	0.32	0.22	720000	320000	220000	0.92	1.97	2.27
7	23	18	14	0.46	0.36	0.28	460000	360000	280000	1.6	1.86	2.08
8	25	20	12	0.5	0.4	0.24	500000	400000	240000	1.5	1.75	2.21
9	28	18	15	0.56	0.36	0.3	560000	360000	300000	1.35	1.86	2.02
10	27	31	10	0.54	0.62	0.2	540000	620000	200000	1.4	1.19	2.34
11	26	17	18	0.52	0.34	0.36	520000	340000	360000	1.45	1.91	1.86
12	28	16	15	0.56	0.32	0.3	560000	320000	300000	1.35	1.97	2.02
13	41	19	9	0.82	0.38	0.18	820000	380000	180000	0.58	1.81	2.42
14	28	21	17	0.56	0.42	0.34	560000	420000	340000	1.35	1.7	1.91
15	30	18	16	0.6	0.36	0.32	600000	360000	320000	1.25	1.86	1.97
16	40	22	21	0.8	0.44	0.42	800000	440000	420000	0.65	1.65	1.7
17	31	25	15	0.62	0.5	0.3	620000	500000	300000	1.19	1.5	2.02
18	27	18	11	0.54	0.36	0.22	540000	360000	220000	1.4	1.86	2.27
19	33	14	7	0.66	0.28	0.14	660000	280000	140000	1.09	2.08	2.58

20	35	15	15	0.7	0.3	0.3	700000	300000	300000	0.98	2.02	2.02
21	39	14	14	0.78	0.28	0.28	780000	280000	280000	0.73	2.08	2.08
22	33	17	8	0.66	0.34	0.16	660000	340000	160000	1.09	1.91	2.49
23	34	22	14	0.68	0.44	0.28	680000	440000	280000	1.03	1.65	2.08
2	41	19	16	0.82	0.38	0.32	820000	380000	320000	0.58	1.81	1.97
25	28	17	17	0.56	0.34	0.34	560000	340000	340000	1.35	1.91	1.91
26	37	15	13	0.74	0.3	0.26	740000	300000	260000	0.86	2.02	2.14
27	32	28	11	0.64	0.56	0.22	640000	560000	220000	1.14	1.35	2.27
28	35	21	16	0.7	0.42	0.32	700000	420000	320000	0.98	1.7	1.97
29	38	24	12	0.76	0.48	0.24	760000	480000	240000	0.79	1.55	2.21
30	26	18	13	0.52	0.36	0.26	520000	360000	260000	1.45	1.86	2.14
Mean Score							640666	396000	270000	1.12	1.78	2.125
CG – control group ; TG –Traditional teaching group; EG – Experimental group							Yield (%)			35.9	60.4	73

It is observed from the table that the sigma mean value of Defects per Million Opportunities (DPMO) was lesser in the experimental group student teachers (270000) than traditional learning group (396000) control group student teachers (640666) in achievement test and it was predicted that the academic grit practices were more helpful to attain better score in the tests. The academic

yield was better in the experimental group student teachers (73) than the traditional group (60.4) and control group (35.9) student teachers.

Control chart

The investigators used the control chart for analysing the defective proportion of the achievement test score to check the effect of transactional process was under control limits.

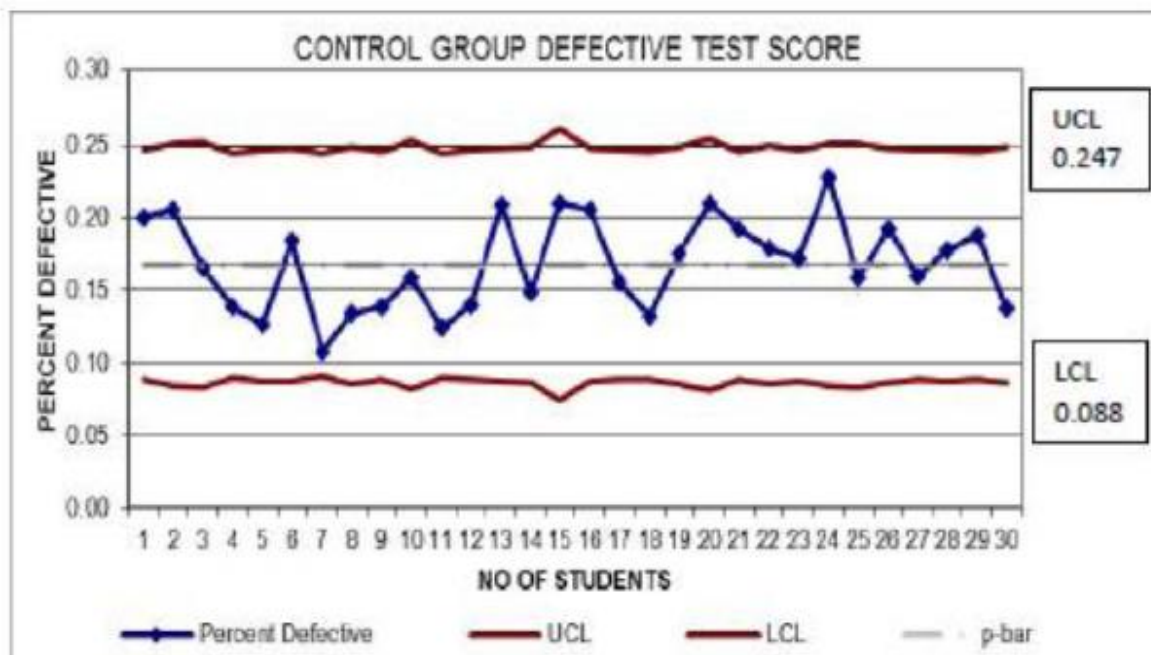


Figure-4: p control chart showing the limits of defective score in the control group

The control chart of the control group showed that 8 student teachers attained more than 0.20 percent

defective value. The maximum defective level was 0.23.

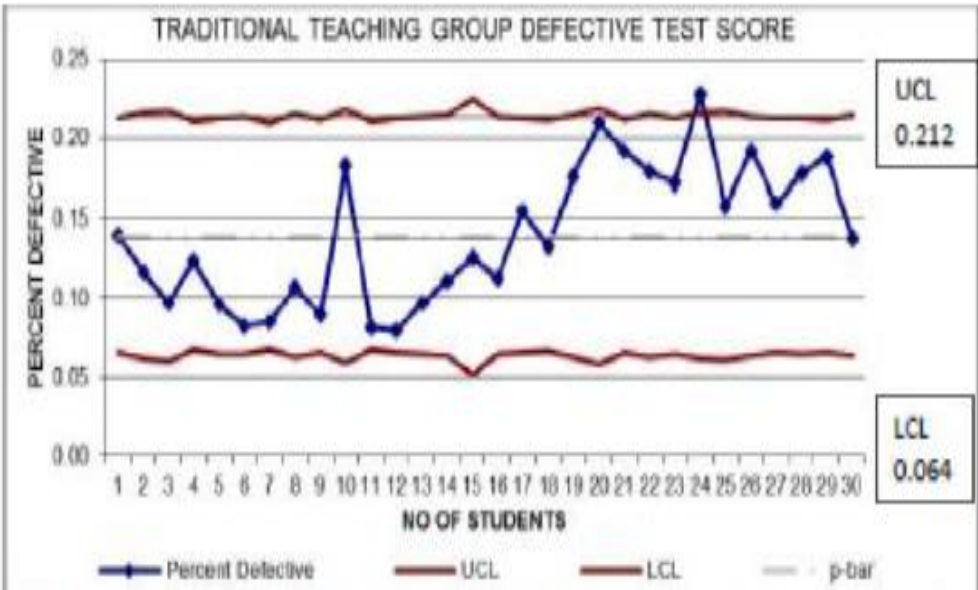


Figure-5: p-control chart showing the limits of defective score in Traditional group

The control chart of the traditional teaching group showed only 2 student teachers attained more than 0.20 percent defective value but 13 student teachers fall within the limits of 0.15. The

defective percent level was very minimum (0.04 – 0.06) for 11 student teachers. It is lower than the traditional (0.23) and control group student teachers.

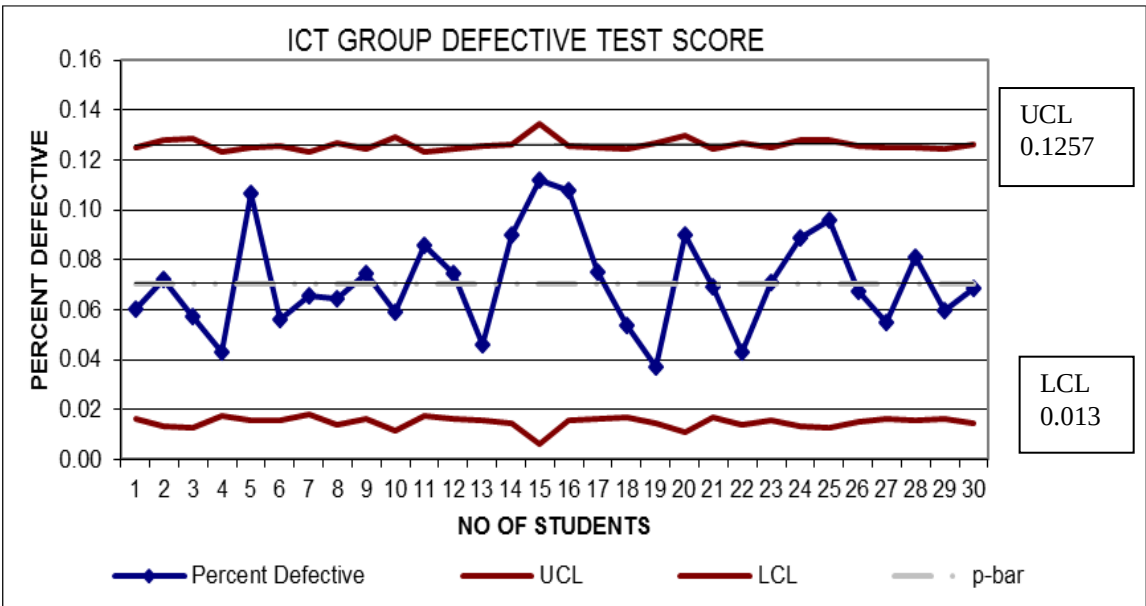


Figure-6: p-control chart showing the limits of defective score in Traditional group

Further, control chart shows maximum defects limit for Experimental group – 12.5 % for traditional group student teachers – 21.2% and for control group – 24.7%. Additionally, 8 student teachers in the control group attained more defective score and higher learning deficiencies. This is due to the poor learning abilities along with the inadequacy in their homes. It is strongly emphasised that the academic persistence is attained by the effortful teaching practices.

The current study reveals that the control chart can show the common cause for variation in the achievement tests formed due to the lack of learning ability and absence of academic grit. It is analogous to the fact that a control chart will minimize the difference in inadequate preparation for tests, commitment, exhaustion, etc., and the probability of making potential errors. (Mirko Savic, 2006). The present study has established the strategies to eliminate the learning defects by the control chart

in teacher education. It is in concurrence with the results of the Durga Prasad, Venkata Subbaiah and G.Padmavathi (2012) who proved that the control chart provides assistance to monitor the procedures in the framework of engineering education.

Considerations of Future Research

The future studies can adopt the six sigma method to measure the academic problems related to psychological, social, personal and moral aspects. Since the six sigma is a proven quality method, it can be used for wide range of problems faced in an academic institution throughout the world. More over the future can be inclusive of the following concepts while undertaking any new research.

The six sigma method of experimentation is to be conducted in future in the educational setting as it is considered to be the analytical study and its relevance for its use has been comprehensively analysed (Deming, 1986). The future consideration of academic research is inclusive of enumerative analysis - a study in which the universe will be triggered.

Further, it must also be noted that Instead of the largely deductive methodology of enumerative statistics, analytic research methods provide knowledge for inductive reasoning. Analytical tools are mostly graphical instruments such as, in the simplest case, run charts or, in the more general case, statistical control charts. Analytical statistics offer organizational guidance, rather than reliable probability estimates.

Conclusion

This study has apparently validated the use of the six sigma method to enhance the academic quality of teacher education system which is firmly operational with the academic grit practices. The future study can be undertaken on six sigma based analytical study to portray the transnational and transcultural academic settings at all academic levels throughout the world.

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