Impact of Research Based Strategies on Student Learning In Senior Secondary CBSE Schools of Indore Using TQM

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ABSTRACT

The aim of current research is to explore the appropriateness, usefulness, understanding and experienced benefit of using the research based strategies as part of TQM and their significance, methodologies and benefits in CBSE schools of Indore. It has been proven that both TQM and research based strategies can separately and effectively reinforce innovation in any organization. This study is undertaken to determine the causal relationship between research based strategies as part of TQM on student learning in Senior secondary schools. The study indicates that though research has technically not been understood and implemented by the school leaders of Indore yet few of the strategies, knowingly or unknowingly are being incorporated in the school system. The findings shoe that Research strategies have positive and meaningful impact on student learning

Keywords: Total Quality Management, Student Learning, Research based strategies

1.   Introduction

It is of vital national importance that we provide our high school students with insights, analysis of the strengths and knowledge of the information so that not only can the challenges of a rapidly globalized and information-driven world be met, but in India the students could also be motivated. in the 21st century. Since traditional school education does not adequately equip high school students with basic thinking and creative problem solving skills, a novel project-based learning program that forms the difference

Research-based programs highlight students ranging from science and commerce to law and humanities to cutting growing areas in all areas. Special efforts have been made to introduce students to nurture advanced topics such as nanotechnology, space law, the impact of AI on society; With the topics of national importance like 'indigenous creation of importance', 'improving the conditions of cloth weavers; to name a few. Students are being directed to do 'Big Picture' and 'Real World' ' problems in their chosen area and to come out with relevant quality solutions that can be presented at International Conferences.

Quality in education means that the focus should be on learning that strengthens the capacities of children to act progressively on their own behalf through the acquisition of relevant knowledge, useful skills and appropriate attitudes, thus creating places of safety, security and healthy interaction for themselves and others.

Learning can happen anywhere but the quality learning needs a conducive environment. Conducive environment comprises physical facilities, infrastructure, instructional material, class size, peaceful environment, discipline policies, teacher's behavior and quality inclusive environment. Most importantly

quality content and various additional services. Research in education refers to systematic attempt to gain a better understanding of the educational process, generally with a view to improve its efficiency.

The concept of total quality management was given by Prof. W Edward Deming in 1950s.This approach was initially applied to profit making corporate. Later it was realized that these can be applied to service organizations including educational institutions. Some of Deming's terminology had to be translated to schools as well. The Principal can be considered as management, Teachers as the managers of the students, Students as employees, learning as the product and Parents as the customers.

Research Based Strategies as part of TQM has not been given due importance by the CBSE schools. Though the schools have indicated the sharing of best practices by visiting other schools and doing informal research on teaching learning process of other schools but the technical factors of Research based strategies i.e. innovation and risk taking, interviewing practices and discussions with other Principals regarding challenges have been found to be contributing negligibly to the research based strategies by the schools. There is a dire need for Innovative Students. In the recently released Bloomberg Innovation Index, the country's annual ranking and its technology power, India is in less than 45 out of 50 countries. Top 5 most innovative countries include South Korea, Germany, Sweden, Japan and Switzerland. The world's two largest economies are ranked on the United States and China respectively number: 8 and China number: 21. In the bottom five, India is surrounded by countries like Serbia, Tunisia, Thailand and Morocco. Development is directly related to the imagination of the individuals, which is essential for the development, affluence and economy of a country and its natives. The ultimate fate of an economy, the majority of government rule, and even the power of the planet's biological system depends on improving the future. In any case, in India, where 46.6% of the population is below 24 years and the proficiency rate is 74.04% - the relationship between innovative culture, innovation and their absence is absent. Bloomberg gives every country a general score, given six similar weighted measurements. These are:

Use of research and advancement as a level of GDP production ;The number of innovative open organizations resident at the local level, such as aviation and military, biotechnology, equipment, programming, semiconductor, internet programming and profit, and durable energy source organization offered to the world's most advanced organizations ;Number of alternate graduates listed in postsecondary organizations as annual percentage of human power and engineering Graduation and the percentage of total tertiary graduates. Professionals including Ph.D scholars per 1 million population Expenditure on R & D. per $ 1 million; Patent filings per million population.

Universally, India falls amongst the low ranking countries in their innovation as a qualification and achievement. Again, if India is expected to end the global monetary powerhouse then it needs to change. Considering the case of business televisions, which are not prevalent in spite of full schools, we will be able to benefit from the progress of all these leaders and how to change training biological system in India in schools so that it can be ensured We create unique trailblazers, to help the Indian economy.

It is fundamental that India creates a community of development and research. A domain where scholars are maintained with innovation, while providing the ability of things to come is essential. This will enable India to jump in the future as a very dynamic country. Therefore, it is necessary to eliminate the beneficial machine gear pieces to run this cycle of our college and school progress.

According to Albert Einstein, inquiries have their special requirement and, most importantly, scholars should not quibble. In any case, as indicated by Nair, the result of the industrial facility of scholars is undoubtedly the opposite, it is a non-inquisitive scholar. Curiosity fosters cerebrum part of brain to learn.

Curiosity makes learning beneficial as a result. Curiosity makes learning more successful and enjoyable. Scholars are better aware of what they are interested in, and it can be on any point or area.

Despite the fact that scholars are constantly better at learning the information they are interested in, even then the exploration also shows that curiosity enables students to learn such information that they do not think about interesting and important Are there. In any case, doing the right inquiry, for example, "machines make me capable of collecting big things?" Or "When I ride on my bicycle, why do I have to wear a head protect?" Quizzes are important for running. It is based on the fact that the inquiry places the mind in a situation that enables it to learn and catch any type of data.

In this way our academic community should encourage the scholars to do something they usually inspire to learn. Desire, therefore, prepare scholars to learn in the same way that are generally reluctant or tiresome for them.

Curiosity makes further learning all the more rewarding: The scientists likewise found that by igniting the spark of Curiosity among scholars can influence their learning encounter all the more fulfilling. This is because of the expanded action in the hippocampus, the piece of cerebrum associated with the making of recollections. Hence, interest can enable scholars to recollect lessons and ideas educated in school which generally is dangerous for some.

The action is additionally expanded in the cerebrum circuit in charge of reward and joy, when understudies wind up inquisitive. Dopamine, which is the vibe great concoction, transfers the messages between neurons which gives the kicks understudies to press hard to achieve accomplishment in noting the inquiry. A kind of feeling when a person gets something attractive, for example, cash.

Curiosity makes Learning more effective and joyful: Inquiries invigorate interest among scholars. Thus, they themselves do not leave any stone upturned to look for answers to enhance their comprehension. Thus, captivating with the scholastic writing with intrigue and comprehension is importance inside the pragmatic setting. Along these lines, it is critical to ingrain powerful urge among scholars to know or pick up something by touching off curiosity.

Surviving Skills in the 21st Century

The educational modules, teaching strategies and tests that scholars' experience in India were intended for the requirements of another period. They are generally obsolete and require re-outline. The fundamental new abilities of 21st Century for being fruitful in advanced education, profession and in-life are: 1.Curiosity and Imagination 2. Critical Thinking and Problem Solving 3. Agility and Adaptability 4.Accessing and Analyzing Information 5. Effective Oral and Written Communication 6. Collaboration crosswise over Networks and driving by Influence 7. Initiative and Entrepreneurialism (Herald. Sarvjeet, Philip G., Sharma Archna , Ganguly. Poulomi, (2016)

There is a squeezing need to give scholars glimpses into his area of enthusiasm through hands on involvement. A vocation that would satisfy and draw out his/her most elevated potential. Envision if a young person was allowed to investigate being a nanotechnologist or a legal advisor or a botanist or a specialist or a market analyst through research based learning, he would be a more gainful national of tomorrow. The school must rouse the scholar to take the primary "child" advance of being a trailblazer through research based learning.

The "research based learning" technique goes for instilling unique reasoning, imagination, critical thinking aptitudes in scholars. Scholars are urged to distinguish a cutting edge subject of passion from differed streams like science, building, prescription, law, business and humanities. They at that point

experience experiential learning, through the development centered research procedure to convey a high level concept paper. The idea paper is fit to be chosen in a national or universal gathering of notoriety.

It is imperative that our corridors of education – schools and colleges rise up to the occasion and play their role of developing young individuals with an innovation mind-set. Only then can we as a nation expedite our growth to becoming one of the largest economies globally by leveraging innovation as a key driver for growth.

II. Literature Review

Cotton, Kathleen(1990);Applying Total Quality Management Principles To Secondary Education, School Improvement Research Series As they work to establish a norm of continuous improvement, staff and students of Mt. Edgecumbe High School in Sitka, Alaska exhibit many characteristics congruent with the research on effective schooling. It was emphasized that the most important: in any organization, total quality is about systemic change. The "lead actor" in TQM is...the process of systemic change itself... The point is to develop the organization as an integrated, organic set of relationships, and to gain the ability to change and direct those relationships again and again in the direction of improvement--as defined by the organization's internal and external customers. These and other TQM concepts, together with their potential application in educational environments, were introduced upon the business/technology teacher's return to Mt. Edgecumbe High School. He began to utilize TQM principles in his computer class. Within a year, students from the computer class prepared and gave presentations--both at Mt. Edgecumbe and elsewhere--on the beneficial effects of TQM principles on their school experiences and personal lives. Interest in the TQM approach spread among Mt. Edgecumbe staff and students, and in a few months, the business/technology teacher, then-Superintendent Larrae Rochelean, and Academic Principal Wilhelm Denkinger attended TQM workshops presented by W. Edwards Deming. TQM Components in the High School Mt. Edgecumbe's implementation of TQM principles has proceeded from an adapted version of Deming's fourteen points for quality in organizations. Called "Mt. Edgecumbe High School's Modified Deming Points for Quality in Education," these goals have been reviewed and updated as the school's program has evolved. Because they guide all of Mt. Edgecumbe's operations, the "points" are reproduced here in their entirety, and she has used boldface type for key ideas within points. Create and maintain a constancy of purpose toward improvement of students and service. Embrace the new philosophy. Work to abolish grading and the harmful effects of rating people. Focus on the learning process, not the rating process. Cease dependence on testing to achieve quality. Work with the educational institutions from which students come. Minimize total cost of education by improving the relationship with student sources and helping to improve the quality of students coming into your system. Improve constantly and forever the system of student improvement and service to improve quality and productivity in personal life and community. Institute continuous training on the job for students, teachers, classified staff and administrators; for all people connected to the human organization or community. Institute leadership. The aim of supervision (leadership) should be to help people use technology and materials to do a better job and set the pace driving human creativity. Drive out fear, so that everyone may work effectively for the school system. Create an environment which encourages people to speak freely and take risks. Break down barriers between departments. People in teaching, special education, accounting, food service, administration, curriculum development and research must work as a team. Eliminate slogans, exhortations, and targets for teachers and students asking for perfect performance and new levels of productivity. Eliminate work standards (quotas) on teachers and students. Remove barriers that rob the students, teachers and management (principals, superintendents and central office support staff) of their right to pride and joy of workmanship. This means abolition of the annual or merit rating and of management by objectives. The responsibility of all educational managers must be changed from quantity

to quality. Institute a vigorous program of education and self-improvement for everyone. Put everybody in the community to work to accomplish the transformation.

Gopalan, Kalpana IAS (2014) ; Developing a Model of Total Quality Management for primary school education in India, examines the concept and strategies of Total Quality Management (TQM), in order to develop a model of TQM based school education for implementation in primary education in India. It begins with a description of challenges of Indian education. After defining the concept of TQM, a philosophy developed for industry by W.E.Deming and adapted to education, it examines its application in the U.S.A. and U.K. A study of the differences between the two nations leads to the analysis that TQM succeeds best as a local school-based initiative. TQM is adaptable as a generic model suitable to the diversity in Indian education. The paper posits a model for TQM in schools, along with enabling conditions and possible pitfalls. TQM is an attitude towards school improvement broad enough to encompass the multifarious needs for school reform in India. Based on the research work in the primary schools of Karnataka, a detailed blueprint for reform is evolved, which incorporates the TQM way of thinking with the major requirements for school improvement. These include: systemic thinking with the school as unit, a decentralized structure, teacher development, teamwork and collegiality, school-level leadership, involvement of the community, focus on the process of learning, and non-threatening assess.

Healey, M. (2005, debated that discipline is an important mediator in constructing linkage between teaching and research. The complex nature of these linkages reflects differences in the concepts of 'research' and 'teaching' on one hand and on the other hand the nature of the disciplinary spaces in which the linkages occurs. This happens because of difference between the approach of teaching and research disciplines. It has also suggested that the research based learning structured around inquiry is one of the most effective ways for students to benefit from research that occurs in departments.

III. Rationale of present study :

Research in education refers to systematic attempt to gain a better understanding of the educational process, generally with a view to improve its efficiency. This study attempts to understand how student learning in Senior Secondary schools shall be assessed using Research based learning as one of the factors of TQM.

IV. Objectives :

- To understand the effect of TQM in context of Senior Secondary Schools

- To explore the scope of acquisition of integrated knowledge and analytical skills.

- To study the scope of research based strategies at the classroom level.

V. Hypothesis :

H_1 There is a significant effect of TQM on student learning in Senior Secondary CBSE schools in Indore.

H_2 There is a significant scope of research based strategies in the student learning process.

VI. Research Methodology :

In this study responses were gathered from principals of CBSE schools Indore. Questionnaires comprising 15 questions were self-administered to different school principals. A **census survey** was conducted wherein data was collected by gathering complete information from all participants in the population i.e. 122 CBSE school Principals (at the time of data collection).. General criteria of a census survey included a complete list of all the CBSE schools in Indore was maintained. The Principals of all the schools were included. The census survey was enforceable and enforcing.

1 The Study

The empirical study was exploratory in nature considering the assessment of student learning in Senior Secondary Schools of Indore district using TQM. The census survey being used as data collection method to complete the study.

2 Research Design:

Since census survey being used as data collection method to conduct the study all 122 CBSE schools of Indore district were taken with demographic factors viz. years of establishment, experiences and ages of principals.

3 The Sample Design

3.1 Population: The population for the study was Principals of CBSE school of Indore district.

3.2 The Sampling Frame: The present study aims to conduct census survey of 122 CBSE schools in which all the Principals was considered during the data collection phase of the study as the sampling frame.

3.3 Sample size: All 122 CBSE school were taken and divided into demographic groups as discussed above under the study design heading.

3.4 Sampling Element: Individual principals ware used as the sampling elements of the study.

4 Tools used for data Collection: Self designed questionnaires on all variables of the study were used to collect responses of the principals of CBSE schools. The questionnaires to evaluate the variables included in the study were prepared after thoroughly reviewing the literature and discussing with the experts in the area of Academics. The primary data were collected on a scale of 1 to 5, where 1 was indicated minimum presence of the element and 5 was indicated maximum presence of the element. Cronbach Alpha Reliability of all measures was computed using SPSS after collecting the complete data for the study but before carrying out any other evaluation of data.

The secondary data was collected through CBSE reports, journals and reports of schools which are published in the form of data base.

5 Tools Used For Data Analysis

●   Internal consistencies of measures were established through item to total correlations of all variables. Items having insignificant correlation coefficient value with total ware removed from the measures.

●   The reliability of all measures was computed by using SPSS software. Cronbatch Alpha (α), split-half, Guttmann, parallel and strict parallel reliabilities coefficients were computed.

●   Face validity of all measures was ensured while selecting the statements (elements) for the measures. Content validity was established through factor analysis and support referencing of factor analysis.

VII RESULTS & DISCUSSIONS

In this section, results from statistical analysis and outcomes of hypotheses testing are presented. In the first section Consistency measures of the items used in the Questionnaire for Data collection are discussed. The reliability of the items in all the Questionnaires has been computed using SPSS and discussed in the next section. To explore the underlying constructs, factor analysis has been applied. This

section also provides results of factor analysis performed on the data sets, including extraction, rotation, and variance explained. In the subsequent sections the relationship between dependent and independent variables are established using linear regression.

Consistency Measure

To test for biases and the validity of the experiment in addition to what is possible from the chosen alternatives, an extra choice set has been included to test for rationality, and then a consistency test is developed. This test relates to whether the respondents understand the concept of the proposed stated discrete choice method and, hence, the extent to which they act rationally when expressing their preferences. This test involves the inclusion of a choice set in which one alternative unquestionably dominates the other(s) on all attributes. According to Kjaer (2005), "Incorrect responses can either be interpreted as a result of irrational respondents, a lack of understanding of the choice task, or a simple mistake on the part of the respondent".

Consistency Measures of Variables

First of all consistency of all the questions has been checked through item to total correlation. Under this correlation of every item with total has been measured and the computed value is compared with standard values. If computed value is found greater than standard value then it termed as consistent and accepted. Cronbach alpha if item deleted from ITC table have also been checked and if found items has less then cronbach alpha if item deleted then only accepted.

Table- 4.1 Showing the Consistency Measures of (A) Research Oriented

S N	Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Consistency	Result
1	Curious	.430	.498	Consistent	Accepted
2	Investigating	.402	.497	Consistent	Accepted
3	Discovering	.459	.478	Consistent	Accepted
4	Observing	.221	.555	Consistent	Accepted
5	Innovative	.350	.514	Consistent	Accepted
6	Involved	.182	.569	Consistent	Accepted
7	Constructive	.122	.587	Consistent	Accepted
8	Informative	.144	.590	Consistent	Accepted

Table- 4.2 Showing the Consistency Measures of Section K (TQM)

S.N	Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Consistency	Result
1	Know about TQM	.373	.494	Consistent	Accepted
2	Apply TQM	.383	.494	Consistent	Accepted
3	Improves work efficiency	.310	.521	Consistent	Accepted
4	Really helps in goal achievements	.419	.481	Consistent	Accepted
5	Focuses on interaction with parents	.315	.519	Consistent	Accepted
6	Impacts on trust	.171	.574	Consistent	Accepted
7	Quality enhancement	.097	.601	Consistent	Accepted

Reliability Measures: Reliability test of all the variables ware carried out using SPSS software and the reliability tests measured are given below-

Variables	No. of Items	Cronbach's alpha	Split Half	Guttman	Parallel	Strict parallel
TQM	7	.567	.542	.563	.574	.569
Research Oriented	9	.726	.701	.738	.730	.730

All the values of reliability measures by Cronbach's alpha, Guttman, Parallel and Strict parallel are greater than .6 which is the standard value for reliability, while taking split half, values showing less than the standard value.

Factor Analysis of Variables

Factor analysis (FA) was undertaken in order to further examine the measurement items used in the present study. According to the Tabachnick and Fidell (2007, p.26) factor analysis is best way to understand the underlying structure about particular theory and its variables in analysis. The general purpose of the factor analysis is to reduce the information contained in a number of measuring items into a smaller set of new composite dimensions/factors (Gorsuch 1983; Rummel, 1970). Hair et al., (2006, P.107 &111) defined two issues for which chiefly factor analysis can be used:

1.   Helps to specify the unit of analysis: The FA is used to identify the structure of relationship (i.e. correlation) either between variables or respondents.

2.   Helps to achieve summarized data and reduced data: In data summarization, FA is used to combine the individuals variables grouped together so they represent collectively the underlying dimensions. Whereas, in data reduction, FA empirically (by factor scores) represents specific variables from much large number of variables to be used in multivariate analysis, or creates entirely new set of variables which is much smaller than the original number, and partially or completely replaced original number of variable set.

KMO and Bartlett's Tests of Research Oriented done by CBSE School

Table - Showing KMO and Bartlett's Test of Research Oriented

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.696
Bartlett's Test of Sphericity	Approx. Chi-Square	120.118
	df	28
	Sig.	.000

The KMO measure is 0 .696 indicating that the sample was adequate. The Bartlett's test of sphericity is 120.118 which is significant at .000 indicating that the data was not spherical.

Factor Analysis of Research Oriented:

Table-: Showing Component Matrix of Research Oriented done by CBSE School

Component Matrix[a]

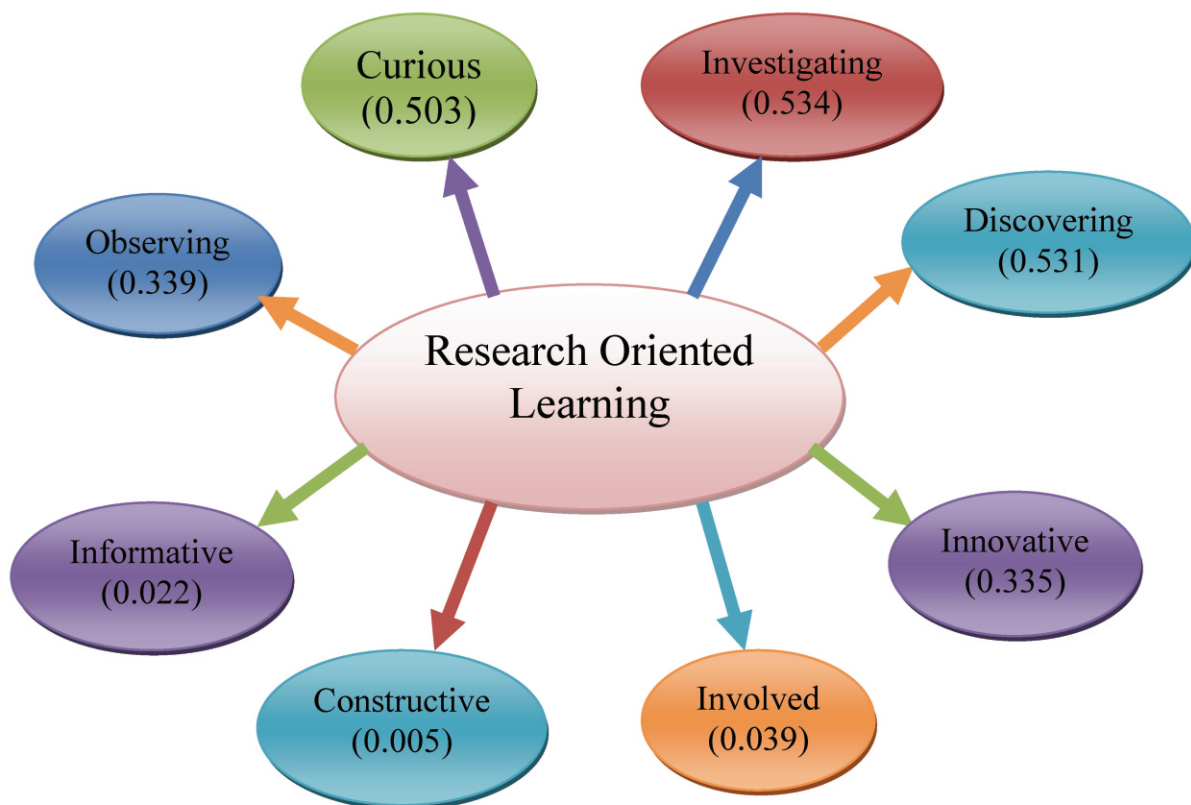|	Items	Component
VAR00002	Investigating	.731
VAR00003	Discovering	.728
VAR00001	Curious	.709
VAR00004	Observing	.582
VAR 00005	Innovative	.579
VAR00006	Involved	.198
VAR00008	Informative	.149
VAR00007	Constructive	

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Table: Showing Communalities of Research Oriented done by CBSE School

Communalities

		Initial	Extraction
VAR00001	Curious	1.000	.503
VAR00002	Investigating	1.000	.534
VAR00003	Discovering	1.000	.531
VAR00004	Observing	1.000	.339
VAR00005	Innovative	1.000	.335
VAR00006	involved	1.000	.039
VAR00007	Constructive	1.000	.005
VAR00008	Informative	1.000	.022

Extraction Method: Principal Component Analysis.

Discussion of factors of Research Oriented done by CBSE School

Above tables of **Component Matrix and communalities shows that all items** contributed towards the construct variable as their values are greater than .2 except Constructive and values of contributions are Investing (0.534), Discovering (0.531), Curious (0.503), Observing (0.339), Innovative (0.335), Involved (0.39) and Informative (0.22) gradually. Though the values of factors, involved, informative and constructive were too low but these could not be eliminated because of their significant importance.

The study reveals that the major proportion of learning consists of cognitive learning. Research based education which is the authentic learning and is the need of the hour has so far been ignored by the schools. Although, efforts like robotics, science fairs, design for change, model UNO do give the school students a platform to explore their talent, there continues to be a pressing need to provide students glimpses into their careers of interest through hands-on experience. It is of critical national importance that we enable our youth to acquire and interpret information through critical thinking and improve their cognitive abilities, which will embed Innovation culture in our society and allow research and development of (a large number of) original and innovative process and products in India. Their dissemination globally, as research based outputs (in the form of publications, patents and/or products), will build the brand \Made in India" and allow us to rapidly become an economic powerhouse.

KMO and Bartlett's Tests of TQM done by CBSE School

Table: Showing KMO and Bartlett's Test of TQM

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.665
Bartlett's Test of Sphericity	Approx. Chi-Square	80.210
	df	21
	Sig.	.000

The KMO measure is 0 .665 indicating that the sample was adequate. The Bartlett's test of sphericity is 80.210 which is significant at .000 indicating that the data was not spherical.

Factor Analysis of TQM:

Table: Showing Component Matrix of TQM done by CBSE School

Component Matrix[a]

	Items	Component
VAR00004	Really helps in goal achievements	.671
VA R00002	Apply TQM	.654
VAR00001	Know about TQM	.633
VAR00005	Focuses on interaction with parents	.608
VAR00003	Improves work efficiency	.568
VAR00006	Impacts on trust	.306
VAR00007	Quality enhancement	.169

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Table-: Showing Communalities of TQM done by CBSE School

Communalities

		Initial	Extraction
VAR00001	Know about TQM	1.000	.400
VAR00002	Apply TQM	1.000	.427
VAR00003	Improves work efficiency	1.000	.323
VAR00004	Really helps in goal achievements	1.000	.451
VAR00005	Focuses on interaction with parents	1.000	.370
VAR00006	Impacts on trust	1.000	.093
VAR00007	Quality enhancement	1.000	.029

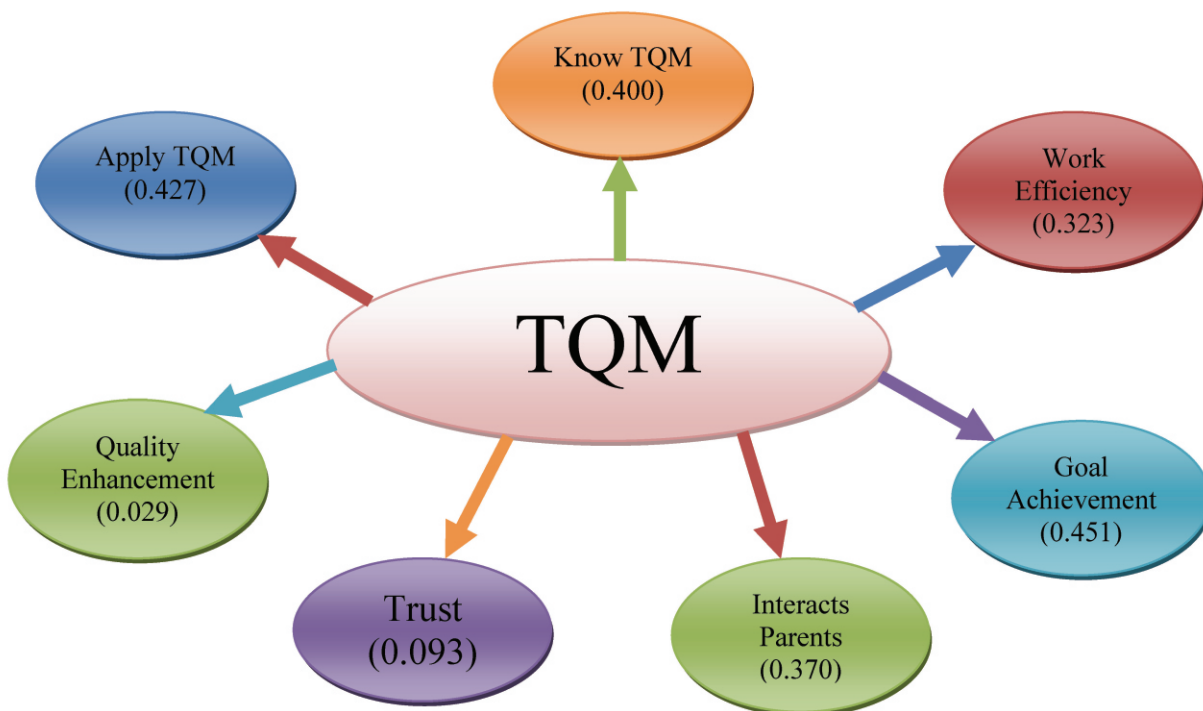Extraction Method: Principal Component Analysis.

Fig: Model Showing components of TQM

Discussion of factors of TQM done by CBSE School

Above tables of **Component Matrix and communalities shows that all items** contributed towards the construct variable as their values are greater than .2 and percentages of contributions really helps in goal achievements (0.451), Apply TQM (0.427), Know about TQM (0.400), Focuses on interaction with parents (0.370), Impacts on trust (0.93) and Quality enhancement (0.29) gradually. Though the values of the factors, Impacts on trust and quality enhancement were too low but could not be eliminated because of their importance.

VIII Limitations:

1.   This study concisely aims to attempt the clear understanding of CBSE prescribed curriculum. Therefore schools affiliated to State board or any other board could not be considered.

2.   The study is purely based on a geographical territory barrier i.e. it is limited to Indore district only.

The study limits to the students coming from upper middle class families only.

IX. Conclusion

Research Based Strategies as part of TQM has not been given due importance by the CBSE schools. Though the schools have indicated the sharing of best practices by visiting other schools and doing informal research on teaching learning process of other schools but the technical factors of Research based strategies i.e. innovation and risk taking, interviewing practices and discussions with other Principals regarding challenges have been found to be contributing negligibly to the research based strategies by the schools. So the hypothesis -There is a significant scope of research based strategies in the student learning process.' is accepted.

Research orientation as a factor of learning has many sub variables contributing to research oriented learning. Being inventive, discovering and curious are considered as major aspects of research though the percentage of their contribution has come out to be quite low. Observation, innovativeness and informative have turned out be of negligible importance. This shows that research orientation which is the major part of learning is being not given much heed in CBSE schools of Indore as there is no provision of assessment system that evaluates research based skills.

Research based learning can be one of the most enriching experiences for the students during the coming times. The students will be engaged in authentic learning comprising selection of real world issues to serve as research topics for their projects. Initially, the students may take little time to get oriented to this new idea but within no time they will be able to think flexibly and apply their novel skills. They will start taking control of what and how of their own learning. The interest vested in achieving those learning goals will be seen to be much higher in their chosen projects than the projects which are assigned to them by someone else. Their mentors and facilitators, can provide them the criteria, planning, timelines, resources and support to reach their goals, without being interfering.

The students of all levels of scholastic credentials are engrossed in the scientific analysis of their areas of work using critical and creative thinking skills. They use their creativity to find hidden patterns, find connections to seemingly unrelated phenomena and bringing new solutions into being. While on one hand they employ the technical procedures to record their observations, there is a remarkable evidence of continuous improvement in their imagination, perseverance, curiosity, adaptability and courage which are the essential soft skills for human development. All these skills are used to find responses to their own doubts and questions. While doing so, their learning is not concerned to short memory anymore. One can

see their confidence and belief in their work. All the students become so comfortable with the complexities of the undefined problems and to deal with ambiguity and put into practice the higher order skills. We all agree that **TQM**, if applied religiously to teaching processes, will make significant difference to the student learning. The contribution of the various sub variables of the Principles of TQM could be seen. It is revealed that CBSE Principals have shown their ignorance towards TQM as a concept but out of their common sense have assumed that they apply TQM directly or indirectly to some extent and feel that TQM helps the organizations in the achievement of their goals. It is surprising to see that the schools feel that TQM has impact on interaction with parents but neither does it impact trust between school and parents and nor does it help in quality enhancement. This analysis gives us a clear picture of the lack of clarity of TQM as a concept. The hypothesis 'There is a significant scope of the effect of TQM on student learning in Senior Secondary CBSE schools in Indore' This calls for planning and implementation of TQM in CBSE schools in its true spirit.

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