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SRI RAMAKRISHNA MISSION VIDYALAYA
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FAMILY DISCIPLINE AND SELF-SUFFICIENCY: A STUDY OF BAGPAT, INDIA

1

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INTRODUCTION

Exploration shows that parental association is a compelling technique to guarantee understudy achievement (Barnard, 2004; Desimone, 1999; Hill and Craft, 2003; Hill and Taylor, 2004; Zellman and Waterman, 1998). Parental contribution has numerous beneficial outcomes on students other than scholastics, including expanded inspiration, confidence, and independence, which may prompt scholarly achievement paying little mind to monetary foundation. Alternately, research confirms that lacking or no parental inclusion adds to low understudy accomplishment and commitment (Bower and Griffin, 2011). Generally, guardians, kin, and other critical family members can establish rich learning conditions to improve youngsters' scholastic turn of events.

Concurring Bower and Griffin (2011), "Parental contribution through exercises, for example, giving nurturance to their kids, ingraining social qualities, and chatting with their youngsters, don't line up with conventional types of parental inclusion as characterized by school". A significant issue in distinguishing purposes of influence in demonstrating students' scholarly accomplishment is deciding how and how much parental contribution (PI) affects understudy accomplishment. Such information may educate nurturing rehearses just as school-based arrangements, practices, and intercessions that include working with guardians. For instance, such examination may help in the plan and improvement of intercessions that boost parental contribution, where it has been appeared to have the best and amazing effect. To aid this undertaking, we evaluated the writing about the sorts of PI that may have an effect. We found that the writing on PI is very "knotty"—complex and now and then opposing. This paper endeavours to unravel the bunch by intently looking at the current writing on the connection among PI and

scholastic accomplishment at the centre and secondary school levels.

The possibility that parental association induces students' scholastic accomplishment is naturally speaking to the point that society by and large, and instructors specifically, have looked at PI as a significant element for the cure of numerous ills in instruction today. During the 1980s and mid-1990s, contemplates were distributed that proposed the significance of parental association in school.

It is evident that distinguishing the impact of PI on scholastic accomplishment is muddled by at any rate three elements:

(a) researchers use different definitions for the PI build,

(b) there is a scarcity of test concentrates in the PI research writing, and

(c) interceding factors and interfacing factors in the PI-scholastic accomplishment story are regularly disregarded. Any effort to explain the function of PI in scholarly accomplishment should think about these issues.

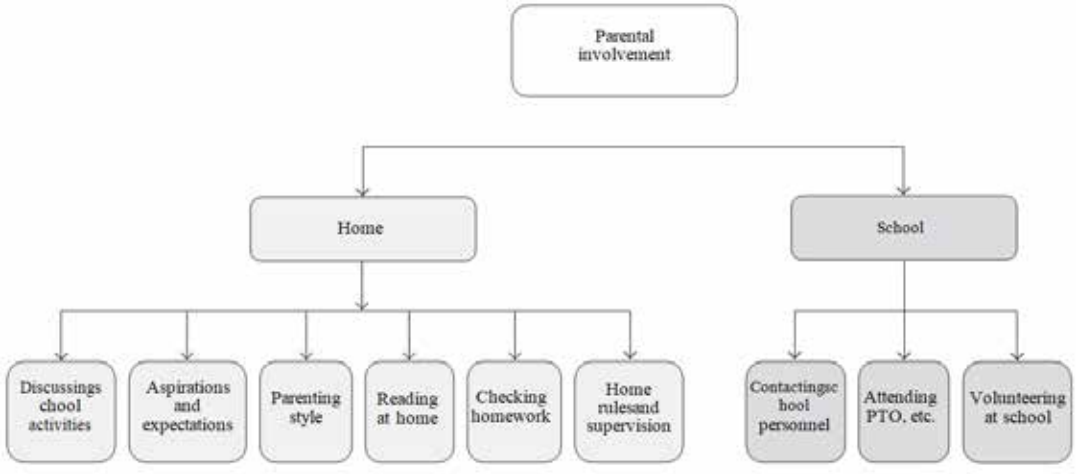

Figure 1.1: Significant aspects of parental participation enacted at home and at school.

STATEMENT OF THE PROBLEM

The No Child Left Behind (NCLB) Act of 2001 (U.S. Division of Education, 2002) ordered that schools close the understudy accomplishment hole by setting a popularity on parental contribution. Absence of correspondence upsets parent cooperation in schools. Elements that add to this absence of correspondence incorporate the powerlessness to talk, perused, and comprehend English in a scholarly or individual school setting and the conviction of guardians that they are violating their limits by addressing specialists or maintaining the privileges of their kids in schools (Smith, Stern, and Shatrova, 2008). For instance, some school destinations don't have frameworks

set up that advance parental contribution as a "priceless resource" for understudy accomplishment. Also, research recommends that schools frequently battle with successfully including guardians in advancing their youngsters' accomplishment (e.g., restricted bilingual staff, correspondences, pamphlets, school schedules, lunch menus not written in the communicated in language), which brings about negligible correspondence with guardians (Smith et al., 2008).

LITERATURE REVIEW

Various factors uphold understudy accomplishment; nonetheless, considers have demonstrated that one of the most basic parts is parental contribution (Hara and Burke, 1998). In general, instructors recognize that parental contribution is critical to fruitful understudy scholarly execution. Schools are putting forth a valiant effort to urge guardians to engage in their kids' scholastic exercises and homework (Griffith, 1996).

Epstein's Six Types of Parental Involvement

Teachers concur that parental contribution is fundamental to understudies' scholarly development; nonetheless, meanings of parental inclusion shift. A customary definition of parental contribution incorporates taking an interest in exercises at school and at home, for example, chipping in at school; speaking with instructors; helping with schoolwork; and going to open houses, back-to-weeknights, and parent-educator gatherings (Bower and Griffin, 2011; Epstein et al., 2009; Hill and Taylor, 2004). Lopez, Scribner, and Mahitivanichcha (2001) characterized parental contribution as "supporting understudy scholarly accomplishment or taking an interest in school-started capacities" (p. 78).

Lai and Vadeboncoeur (2012) noticed the obligation of a school to advance parental association has become an aloof demonstration, as opposed to a certifiable exertion. What's more, guardians are frequently substitutes when attempting to locate the fault to understudy accomplishment. For instance, a few teachers reprimand guardians for the kids' scholarly disappointments (e.g., "If just the guardians helped at home" or "Guardians simply couldn't care less about school"). Regardless of these comments, research keeps on acknowledging parental association as an approach to expand scholastic accomplishment adequately. Studies show that guardians are, truth be told, a solid autonomous variable in spurring their youngsters to learn (Gonzalez-DeHass, 2005).

Parental association relates to numerous builds of school, for example, commitment, which incorporates going to parent-educator meetings, adding to extracurricular exercises, observing understudy grades, conferring parental qualities, assisting with schoolwork, and giving inherent and extraneous inspiration. In any case, Lai and Vadeboncoeur (2012) noticed that schools have neglected to connect with guardians completely.

Contextual analyses on Parental Involvement and Student Achievement

Gonzalez-DeHass et al. (2005) contended that when guardians are associated with their youngsters' schools, scholarly inspiration and accomplishment increment. Understudies' revenue in learning, fitness, and comprehension of a branch of knowledge, improves and advances understudy accomplishment. Haas and Reiley (2008) analyzed approaches to expand schoolwork finish among center school understudies utilizing chosen intercessions.

Hara and Burke (1998) researched whether downtown third grade understudies experienced huge and continued scholarly development when their folks were all the more straightforwardly engaged with the school. They directed an evaluation to figure out what the grade school expected to do to guarantee a successful parent inclusion program.

Bower and Griffin (2011) utilized the Epstein model as a procedure to contemplate parental association in a high destitution, high minority primary school. The investigation included an understudy assortment of 347 understudies of multiethnic foundations. Five educators and two individuals from the regulatory group were met for this examination. The scientists utilized a computerized voice recorder and interpreted reactions to the inquiries verbatim. Gathered information likewise comprised of field notes dependent on perceptions of formal parental association exercises inside the school climate. Correspondence and home learning comprised of week after week reports shipped off guardians and individual calls made by educators and the head to welcome guardians to class occasions.

Georgiou and Tourva utilized two instrumental scales to gather information. The primary was the Parental Attributions Scale (PAS), which was created by O'Sullivan and Howe (1996) and later adjusted to an attribution hypothesis proposed by Weiner (1985). The 21-thing scale inspected qualities or attributions that guardians make about their youngsters' accomplishment.

As per Menninger (1999), passionate development incorporates the capacity to manage reality. Passionate development is a cycle in which the character is persistently taking a stab at more noteworthy feeling of enthusiastic wellbeing, both intra-truly and intra-actually. Social development as a degree of social aptitudes and mindfulness that an individual has accomplished comparative with specific standards identified with an age gathering.

OBJECTIVES OF THE STUDY

1. To study the family discipline among the secondary students.
2. To examine impact of family discipline on achievement motivation on secondary students.
3. To analyse the influence of disciplinary control and resultant academic achievement among the secondary students.

PURPOSE OF THE STUDY

The purpose of this study was to determine whether there is some influence due to disciplinary control and resultant academic achievement among the students. This study findings provide valuable evidence regarding the role of parents in schools performance of their children.

CONSTRAINTS AND DELIMITATIONS

This investigation is restricted to auxiliary level students who studied up to higher secondary school situated in Baghpat district of Uttar Pradesh in the 2017-2018 scholarly year. With the end goal of this investigation, sex, financial status (SES), and understudy participation were not thought of. The experience of the optional instructors was additionally not thought of.

RESEARCH METHODOLOGY

A Cross-sectional, illustrative correlational exploration configuration was embraced for directing this examination. Descriptive technique for research followed by a quantitative methodology has been utilized in the investigation. To understand the objectives of study correlational methodology has been followed which centers after inspecting the relationship of segment attributes of students being male or female, sort of school qualities (government or private) and scholarly accomplishment of students with the relationship of mother and father.

The examination was directed at chosen schools of Baghpat district in the Uttar Pradesh. The number of inhabitants in this investigation was all the students concentrating in optional schools. The example size of the investigation was 200 students comprising of 110 young men and 90 young ladies who passed the X norm. Arbitrary examining method was received to choose the settings and students.

POPULATION AND SAMPLE

The number of inhabitants in the current study was secondary school students in all districts of Baghpat. The extent of the current examination was delimited to schools arranged in the different zones of Baghpat districts of Uttar Pradesh. There are absolute 8459 secondary schools in Uttar Pradesh. Following non-likelihood approach of test determination, Baghpat districts of Uttar Pradesh has been chosen for the investigation. There are 9 Clusters in Baghpat block of Baghpat district. Dhanaura Silvernagar Cluster of Bagpat Block in Baghpat district was chosen. There are 19 schools in Dhanaura Silvernagar Cluster of Bagpat Block. Out of these 19 schools an example of 200 students was chosen through arbitrary testing technique. Following irregular examining approach all students passed ninth grade established the example. 200 secondary school students were chosen for the direct of study, of this number 43% (83) were young men and 57% (117) were young ladies. The students' age went from 15 to 17 with a mean time of 15.9

and most of students (95.5%) revealed that they have a provincial foundation.

Parent-Child Relationship Scale (PCRS-RN) by Rao (2011)

The instrument contained 100 things classified into ten measurements to be specific, ensuring, emblematic discipline, dismissing, object discipline, requesting, apathetic, representative prize, cherishing, object reward and ignoring. Every respondent scores the device for both dad and mother independently. Things are basic for both the guardians aside from three things which are extraordinary, in the dad and mother frames because of the idea of variety in fatherly and maternal relationship with youngsters. Respondents have been approached to rate proclamations concerning their own impression of their relationship with one or the other dad or mother on a five-point scale going from 'Consistently' to 'once in a while' weighted 5, 4, 3, 2 and 1 on the scale focuses. The scale is scored independently for every one of the parent. Subsequently, every respondent acquires ten scores for 'father structure' and ten for 'mother structure' on the ten components of the scale.

The tools used for the study were proforma to collect background characteristics of children, rating scale on Parental involvement and Achievement test in Social science.

a. Parental Involvement Test

Parental involvement refers to parents' involvement in all aspects of their children's education and development. It is measured in this study using a tool created by Paulraja and Alphonse Raj (2008). The tool includes 59 items that assess various facets of parental involvement in their children's education. It's a five-point rating scale with scores ranging from 1 to 5, based on children's responses to parental participation (Always, Frequently, Sometimes, Occasionally and Not at all). As a result, the total possible score ranges from 59 to 295. The obtained score is transformed to a percentage and classified as high (75-100%), moderate (50-74%), or low engagement.(Below 50%) based on the scores obtained by the students. The test-retest reliability co- efficient of the tool was found to be r= 0.84, indicating the high reliability of the tool.

2. Achievement Test in Social Science

Achievement The investigators created a Social Science test with the cooperation of concerned teachers to measure the students' Social Science achievement. It comprised of 25 multiple-choice questions (one correct answer and three distracters) drawn from social science disciplines such as history, geography, civics, and economics. For the test, a time limit of 30 minutes was established. The test's test-retest reliability coefficient was discovered to be r = 0.82.

DATA COLLECTION PROCEDURE

The researcher got written informed consent from the selected students to participate in the study after an initial introduction. Prior to the data gathering operation, a guarantee of confidentiality

was issued. The data was collected using specified and pretested tools in their individual class rooms, utilising the self-administration approach, within the time provided by the concerned class coordinator.

Using SPSS version 22, the collected data was analysed using appropriate descriptive (Frequency, percent, Mean, and SD) and inferential statistics – person's correlation (r) test based on the study's objectives.

FINDINGS AND DISCUSSION

1. Parent-kid relationship

Tables 1 and 2 show mean scores of various elements of parent-kid relationship (mother and father) alongside SDs regarding achievement, sexual orientation and kind of school. Ensuring, emblematic prize, adoring, object reward are positive measurements, then again representative discipline, dismissing, object discipline, requesting, disregarding are negative components of parent-youngster relationship and just one measurement specifically Indifferent is unbiased measurement. The outcomes have been clarified by remembering the qualities of the measurements.

It very well might be seen from Table 1 that mean scores of successful people is higher than lower achiever secondary school students in ensuring, emblematic prize, cherishing measurements of mother-kid relationship. The t-estimations of these measurements ended up being 3.43, 5.34, 3.52 ($p<0.01$) separately. Secondary school students whose achievement is high see their moms as securing, adoring and gives emblematic prize as in these elements of mother-youngster relationship exists huge connection among achievement and ensuring, (0.424, $p<0.01$), cherishing (0.666, $p<0.01$) and representative prize (0.442, $p<0.01$) measurements.

Further Table 1 portrays that mean scores of low achiever secondary school students is higher than successful person secondary school students in representative discipline, dismissing, object discipline, requesting, and disregarding measurements of mother-kid relationship. The t-values in dismissing and disregarding measurement of mother-kid relationship ended up being 4.39 and 5.17 which are huge at 0.01 level. In this way, it tends to be presumed that low achiever secondary school students see that their moms are dismissing and disregarding when contrasted with their partners having high achievement. Further consequences of biserial connection shows that there is critical connection among achievement and dismissing ($r =0.549<0.01$), object discipline and disregarding ($r=0.653$; $0.218<0.01$) measurements of mother kid relationship. Low achievers essentially see their moms as dismissing, disregarding and gives object discipline when contrasted with successful people since mean scores of low achievers is more noteworthy than successful people in these measurements.

Table 1: Mean, SD, *t*-ratio and Values of Coefficient of Correlation of Parent-Child Relationship (Mother) in Terms of Achievement, Gender and Type of School.

	High Achievement/Low Achievement						Male/Female						Government/Private					
	Mean	SD	Mean	SD	r	*t*-ratio	Mean	SD	Mean	SD	r	*t*-ratio	Mean	SD	Mean	SD	r	*t*-ratio
Protecting	36.50	3.94	33.96	3.56	0.424**	3.43**	33.02	3.89	35A7	4.15	0.299**	430*	34.20	3.98	34.22	4 0	0.002	0.04
Symbolic Punishment	25.08	6.08	26.56	4.91	0.168	1.35	2591	5.88	25.85	5.17	0.007	0.070	26.79	4.84	23.11	5.17	0367**	5.26**
Rejecting	21.08	4A1	24.72	3.90	0.549**	439**	23.42	4.45	23.00	533	0.042	0.610	25.09	4.22	20.59	2.92	0.628**	8.84**
Object Punishment	21.56	6.01	23.34	5.22	0.218**	1.57	23.63	5.71	21.25	5.08	0.217**	3.05**	23.42	4.91	18.25	5.06	0.518**	7.39**
Demanding	30.68	4.59	31.08	4.14	0.057	0.46	29.67	4.45	31.83	436	0.241**	3.42**	31.50	4.43	3037	4.59	0.125	1.77
Indifferent	27.82	5.04	25.6	5.14	0302**	2.44**	2534	5.08	26.60	432	0.129	1.83	21.80	4.82	25.25	2.82	0.006	0.09
Symbolic Reward	39.20	6.09	33.06	5.45	0.666**	534**	32.67	4.78	37.27	6.18	0.412**	5.89**	34. 44	5.29	36.96	4.79	0.221**	3.14**
Loving	37.52	5.59	33.82	4.90	0.442**	3.52**	32.73	5.05	35.86	6.02	0.278**	3.98**	34.71	5.25	33.85	6 75	0.020	1.01
Object Reward	28.76	5.03	28.08	5.86	0.078	0.62	27.44	5.97	27.30	5.44	0.012	0.170	27.55	5.37	26.40	3.85	0.124	1.74
Neglecting	21.00	5.22	25.96	1.28	0.653**	5.17**	24.73	4.31	22.47	5.12	0..236**	3.42**	25.06	4.18	1933	3.25	0.703**	10.05**

*Significant level at 0.01 level

** Significant at 0.05 level.

Table 1 further shows that mean scores of young lady secondary school students is higher than kid secondary school students in securing, emblematic prize, cherishing measurements of mother-youngster relationship. Young ladies see that their moms are all the more securing, cherishing and gives emblematic compensation when contrasted with kid secondary school students since *t*-values in these measurements ended up being 4.30, 5.89 and 3.98 ($p<0.01$). The estimations of coefficient of connection among's sexual orientation and mother-kid relationship measurements of ensuring, emblematic prize and cherishing ended up being 0.299, 0.412, 0.278 ($p<0.01$) which portrays that young lady secondary school students see their moms to be securing, adoring and gives representative award when contrasted with young men.

Then again, young men senior secondary school students sees their moms to give object discipline and their relations with their moms as requesting and ignoring when contrasted with young ladies secondary school students. The *t*-values (3.05, 3.42, 3.42) of these measurements ended up being huge at 0.01 level. There is critical connection among sexual orientation and item discipline (r= 0.217), requesting (r= 0.241) and ignoring (r= 0.236) measurements of mother-youngster relationship among senior secondary school students. Mean scores of young men are higher than young ladies in these elements of mother-kid relationship.

Private secondary school students see their moms to give emblematic prize (*t*-value= 3.14, r= 0.221, $p<0.01$) when contrasted and government secondary school students. Then again, government secondary school students see that their moms to give representative discipline, (*t*-value= 5.26, r= 0.367, $p<0.01$), object discipline (*t*-value= 7.39, r= 516, $p<0.01$), dismissing (*t*-value= 8.84, r= 0.628, $p<0.01$), and show ignoring (*t*-value= 10.05, r= 0.703, $p<0.01$) conduct when contrasted and private secondary school students.

Table 2 shows that successful person secondary school students see that their dads as ensuring (*t*-value= 2.49, r= 0.294, $p<0.01$), cherishing (*t*-value= 2.21, r= 0.276, $p<0.01$) and give representative prize (*t*-value= 4.44, r= 0.537, $p<0.01$) then again low achiever secondary school students see that their relationship with their dads as dismissing (*t*-value= 3.79, r= 0.475, $p<0.01$), ignoring (t-value= 4.55, r= 0.568, $p<0.01$) and they give emblematic and object discipline (*t*-value= 2.87, 4.48, r= 0.397, 0.562, $p<0.01$) when contrasted with successful people students.

Young lady school students see that their dads are ensuring, gives representative prize (*t*-value= 2.56, r= 0.176, $p<0.01$) when contrasted with young men students. While young men see that their relationship with their dads is dismissing (*t*-value= 2.58, r= 0.181, $p<0.01$) and give subject and article.

Table 2: Mean, SD, *t*-Ratio and Values of Coefficient of Correlation on Parent-Child Relationship (Father) in Terms of Achievement, Gender and Type of School.

	High Achievement/ Low Achievement						Male/Female						Government/ Private					
	Mean	**SD**	**Mean**	**SD**	**r**	***t*-value**	**Mean**	**SD**	**Mean**	**SD**	**r**	***t*-value**	**Mean**	**SD**	**Mean**	**SD**	**r**	***t*-value**
Protecting	36.02	4.10	34.18	3.72	0.294**	2.49**	34.03	430	35.08	3.85	0.126	1.77	34.35	3.56	34.94	4.51	0.072	1.03
Symbolic Punishment	23.28	5.13	26.50	5.02	0.397**	2.87**	25.81	5.26	23.88	5.04	0.184**	2.64**	26.42	5.14	22.99	431	0342**	4.92**
Rejecting	21.40	4.79	25.16	5.12	0.475**	3.79**	23.86	5.48	22.45	5.15	0.001	1.85	25.08	5.16	21.03	430	0.404**	5.81**
Object Punishment	19.22	5.44	14.14	5.53	0.562**	4.48*	23.96	8.70	20.07	5.27	0.274**	3.63**	24.22	5.56	19.20	7.67	0.373**	5.04**
Demanding	31.42	4.91	30.98	4.60	0.057	0.462	31.73	5.74	31.35	4.62	0.036	0.526	31.86	4.38	31.15	5.73	0349**	1.00
Indifferent	26.36	4.68	25.20	4.89	0.151	1.21	26.65	5.79	25.50	4.44	0.110	1.52	25.23	5.38	26.31	4.65	0.145*	2.08*
Symbolic Reward	39.44	5.21	33.74	8.05	0.537**	4.44*	34.79	4.70	37.02	7.70	0.176**	2.56*	34.44	7.14	37.72	5.83	0.252**	3.50**
Loving	37.26	5.63	34.80	5.51	0.276**	2.21*	35.02	5.43	35.58	6.48	0.046	0.663	35.19	5.83	35.50	629	0.025	0.361
Object Reward	28.30	625	27.56	9.59	0.058	0.459	27.55	6.03	26.91	8.01	0.044	0.646	27.37	7.80	26.99	630	0.026	0.372
Neglecting	21.84	4.54	26.12	4.88	0.568**	4.55**	24.89	5.20	22.95	5.30	0.181**	2.58**	24.95	4.54	22.58	5.79	0225**	3.26**

*Significant at 0.01 level.

** Significant at 0.05 level.

Measurements of father kid relationship are decidedly and fundamentally related with the sort of school as unmitigated variable. Private secondary schools altogether see that they their dads give them representative prize (t-value= 3.50, r= 0.252, p<0.01) when contrasted with government school students. Then again, government school students see that their relationship with their dad is dismissing (t-value= 5.81, r= 0.404, p<0.01), and disregarding (t-value= 3.26, r= 0.225, p<0.01) and they likewise give them representative and item discipline (t-value= 4.92, 5.04, r= 0.342, 0.373, p<0.01).

2. Family discipline and motivation achievement

Another purpose of this study was to determine whether differences exist in family discipline and motivation achievement between 10th grade students whose family members were highly involved in school and 10th grade students whose family members were not involved in school. The results of this study may be useful to teachers and administrators who wish to develop programs that encourage greater parent participation in schools. The sample consisted of 30 tenth grade students (Experimental Group) whose families were highly involved in school and 30 tenth grade students (Control Group) whose family members were not involved. The researcher used the Statistical Package for the Social Sciences 17.0 (SPSS) to analyze the benchmark data.

The current examination was directed with the points of investigating the distinctions in learning and accomplishment inspiration of ACADEMIC PERFORMANCE and FAMILY DISCIPLINE understudies and the understudies from various companion circles. The examination was directed on 360 understudies age going from 14 to 21 years, the example of 360 understudies were chosen haphazardly from the four urban areas of Kumaun Region of Uttarakhand-Haldwani, Ramnagar, Rudrapur and Nainital. The 180 understudies identified with ACADEMIC PERFORMANCE (Above Poverty Line) and other 180 identified with FAMILY DISCIPLINE (Below Poverty Line) were chosen. From the initial 180 understudies identified with ACADEMIC PERFORMANCE, 90 understudies have high companion circle and staying 90 understudies have low companion hover and in the 180 FAMILY DISCIPLINE understudies, 90 understudies have high companion circle and staying 90 understudies have low companion circle.

ANOVA has been applied with the end goal of examination. The F-esteem for the learning and accomplishment inspiration were figured. When the information has been gathered, the following stage is to lessen them into factual investigation on the grounds that the information have no significance except if it is examinations and deciphered by refined measurable procedures to show up at certain solid and legitimate ends. Examination

of information, in this way includes the breaking of the unpredictable components into straightforward parts and placing them in new game plans with the end goal of understanding. The information was dissected keeping in view different speculations which were figured by the various destinations set in the current examination. An endeavour has been made to interface the results of the investigation of information, to show up succinct end.

Table 3: Summary Table of Analysis of Variance Learning (Family discipline and Friend-Circle)

Source of Variation	Sum of Squares	df	Mean Squares	F
Between Family discipline	380.28	1	380.28	0.76
Between Friend-Circles	3699.2	1	3699.21	7.37**
Interaction (Family discipline and Friend-Circle)	3004.44	1	3004.44	5.99*
Within Group	178634.56	356	501.78	- -
Total	**185718.49**	**359**	- -	- -

**<0.01*<0.05

The scrutiny of table shows that the F-esteem for the impact of family discipline on learning is 0.76 which isn't critical at 0.05 level, accordingly implying that there is no huge impact of family discipline of guardians on the learning style of understudies. Hence the speculation that there would be critical impact of family discipline of guardians on the learning style of understudies is dismissed. The mean qualities for the family discipline impact introduced in the Fig. 1.

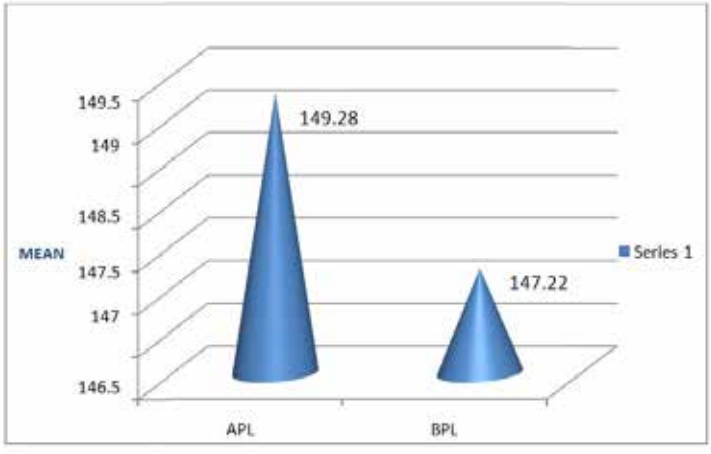

Fig. 1: Mean values showing the Family discipline effect on Learning

The F-ratio for the companion circle impact is 7.37 which is huge at 0.05 level. This implies that there is huge impact of companion hover of understudies on the learning of the understudies. Subsequently, the speculation that there would be critical impact of companion hover of understudies on their learning is acknowledged. The mean value of learning in setting with companion circle is introduced in Fig. 2.

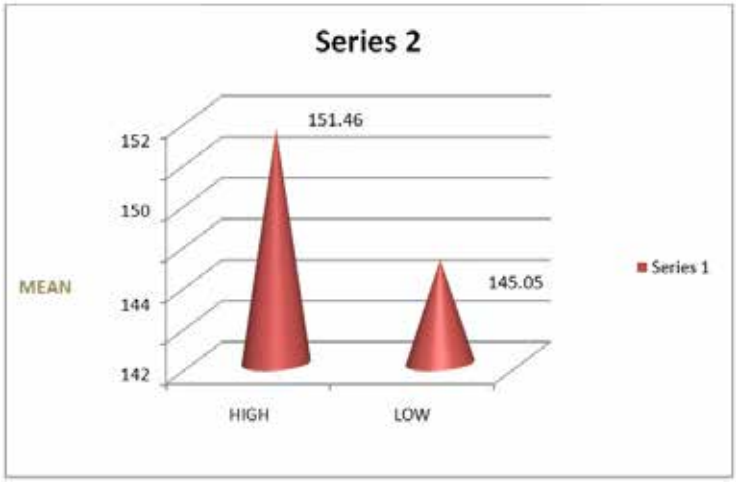

Fig. 2: Mean value showing the friend- circle effect on learning

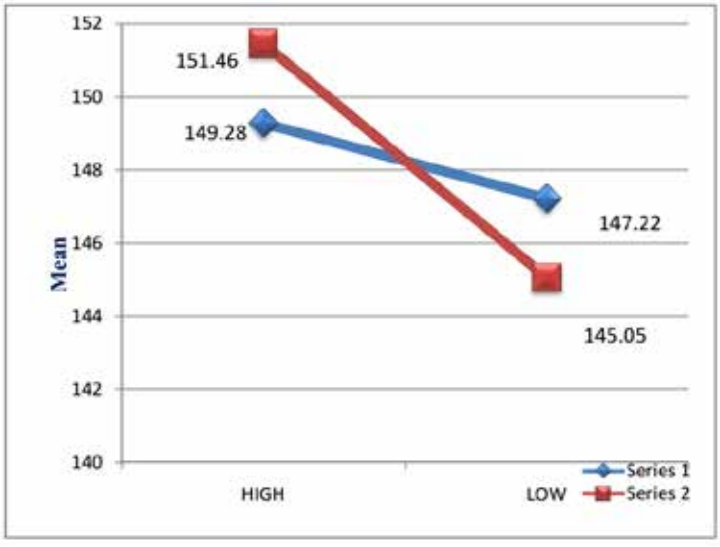

Fig. 3: Mean value showing the Interaction effect of Family discipline and Friend- Circle on Learning

The F- value for the interaction effect of family discipline × friend- circle on learning came out to be 5.99, which is significant at 0.05 level. This means that significant interaction effect of family discipline and friend- circle influence the learning of students. Thus, the hypothesis that there would be interaction effect of family discipline and friend-circle on their learning style is accepted. This indicates that in ACADEMIC PERFORMANCE students (or in the students belongs to ACADEMIC PERFORMANCE parents) the learning style is better because ACADEMIC PERFORMANCE students have high friend- circle which means they have more number of students in their friend- circle who have scored more than 60% marks in previous class, that's why they have better learning style.

Mean Value Showing the Effect of Family Discipline and Friend- Circle on Enactive Constructive Learning Style

Table 4: Summary Table of Analysis of Variance
Figural Reproducing (FR) Learning Style (Family discipline and Friend- Circle)

Source of Variation	Sum of Squares(ss)	df	Mean Squares (ms)	F
Between Family discipline	675.14	1	675.14	37.57**
Between Friend-Circles	293.4	1	293.4	16.33**
Interaction (Family discipline and Friend- Circle)	66.73	1	66.73	3.71
Within Group	6397.59	356	17.97	- -
Total	**7432.86**	**359**	- -	- -

**<0.01, *<0.05

The scrutiny of Table 4 shows that the F-ratio for the critical impact of family discipline on Figural Reproducing learning is 37.57 which is huge at 0.01 level, in this manner implying that there is critical impact of family discipline of understudies on the Figural Reproducing learning style of understudies. Along these lines, the theory that there would be critical impact of family discipline of guardians on the figural recreating learning style of understudies is acknowledged. The mean values for the family discipline impact introduced in the Fig. 4.

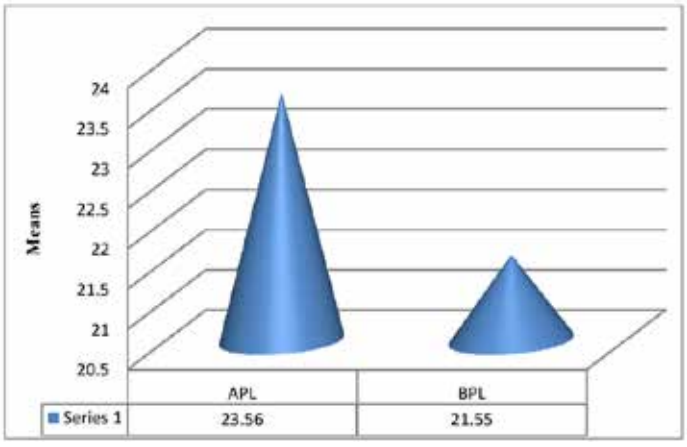

Fig. 4: Mean values showing the Family discipline impact on Figural Reproducing Learning style

The F-ratio for the companion circle contrast is 16.33 which is huge at 0.01 level. This implies that there is a huge impact of companion hover of understudies on the figural recreating learning style of the understudies. Accordingly, the theory that there would be a critical impact of understudies' companion hover on their figural replicating learning style is acknowledged. The mean value of learning in setting with a companion circle is introduced in Fig. 5.

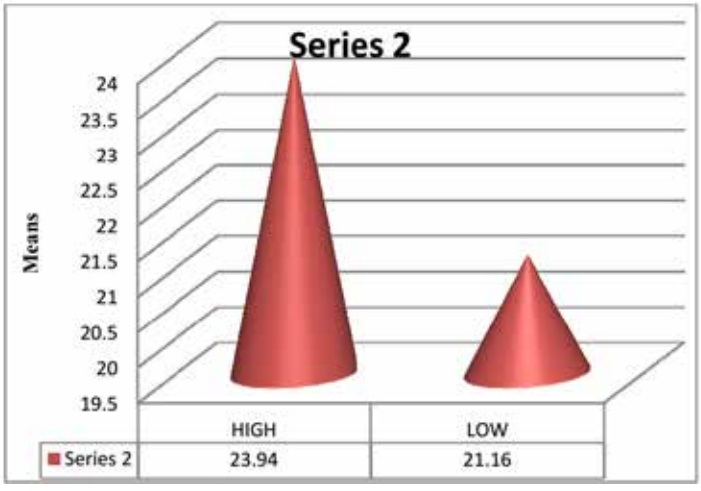

Fig. 5: Mean values showing the Friend- circle effect on Figural Reproducing Learning style

FINDINGS AND DISCUSSION RELATED TO THE HYPOTHESES

Hypothesis 1 claimed that there is no significant difference in motivating accomplishment between tenth students whose family members were heavily involved in school activities and tenth pupils whose family members were not. This researcher used an independent t-test to compare the ELA mean scores of the two groups in order to evaluate this hypothesis. The *p*.05 level of significance was used to determine significance. The Experimental Group outperformed the Control Group by a wide margin, according to the data analysis. The mean difference (*p*=.001) was 32.33.(see Table 5).

Table 5: Independent *t*-Test for End-of-Year Tenth grade District Benchmark: Motivational Achievement

	n	M	SD	*t*	*p*
Experimental	30	357.43	44.86	3.572	.001*
Control	30	325.10	39.54		

*p<.05

Hypothesis 2 claimed that there is no significant difference in mathematics achievement between tenth graders whose family members were heavily involved in school activities and tenth graders whose family members were not. This researcher used an independent t-test to compare the mathematics mean scores between the two groups in order to evaluate this hypothesis. The *p*.05 level of significance was used to determine significance. The Experimental Group outperformed the Control Group by a wide margin, according to the data analysis (see Table 6).

Table 6: Independent *t*-Test for End-of-Year Tenth grade District Benchmark: Family Discipline

	n	M	SD	*t*	*p*
Experimental	30	392.6	64.67	3.57	.001
Control	30	339.87	48.539		

*p<.05

EXPLANATIONS WITH THE ANALYSIS RESULT

A huge issue in distinctive motivations behind impact in exhibiting understudies' academic achievement is choosing how and how much parental commitment (PI) affects understudy achievement. Such data may teach supporting practices similarly as school-based game plans, practices, and mediations that incorporate working with gatekeepers. For example, such assessment may help in the arrangement and improvement of interventions that support parental commitment, where it has been seemed to have the best and

astounding effect. To help this endeavour, we assessed the expounding on such PI that may have an impact. We found that the composition on PI is exceptionally "knotty"— complex and sometimes contradicting. This paper attempts to disentangle the bundle by eagerly taking a gander at the current composition on the association among PI and educational achievement at the middle and secondary school levels.

The likelihood that parental affiliation incites understudies' academic achievement is normally addressing the point that society all things considered, and teachers explicitly, have taken a gander at PI as a huge component for the fix of various ills in guidance today. During the 1980s and mid-1990s, thinks about were conveyed that proposed the centrality of parental relationship in school. During the 1990s, the notable press, technique makers, and school managers viably pushed PI. Establishment was organized, for instance, the Goals 2000: Educate America Act and the reauthorized Elementary and Secondary Education Act (ESEA) in the United States, which has made watchmen's relationship in their children's schooling a public need. Schools have been asked to reexamine their parental affiliation courses of action and programs and to display creative techniques to procure government preparing dollars. For example, capability for Title I financing is as of now subordinate upon the headway of plans where families and schools acknowledge regular responsibility for adolescents' learning.

CONCLUSION

The reason for this examination was to decide if contrasts exist in Motivational Achievement and Family discipline between tenth grade students whose relatives were exceptionally engaged with school and tenth grade students whose relatives were not associated with school.

Over all, the results of the study indicated that secondary school students perceive differently their parents on different dimensions of parent-child relationship on the basis of gender, type of school and academic achievement. It seems that not only academic achievement but another socio-contextual variables also play their role in shaping parent-child relationship. It was suggested that there is need to understand the importance of developing better parent-child relationship by the school authorities, teachers and parents also. Parents can develop a better understanding of the areas which are responsible for lowering of relationship. Programs to improve a child's academic performance can be designed by evaluating specific parenting practises that are changeable, such as parent-child connections, and the mechanisms through which these practises influence academic achievement. The design of policies, practices and interventions should reflect an understanding of these findings about the nature and quality of parental relationships on children's academic achievement.

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DEVELOPING INTERDISCIPLINARY UNDERSTANDING THROUGH TEACHING WITH SUBJECT-SPECIFIC VOCABULARY IN CHEMISTRY – A PEDAGOGUE PERSPECTIVE

2

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INTRODUCTION

It is a proven fact that marks that we scored in schools, colleges, and universities are of little help in managing professional and personal life successfully. Some of the greatest and most successful people were neither 'A graders', nor do they care enough about it too and remember it always. On the contrary, we do remember the instances, experiences, encounters etc. that we had in school because those experiences have given us various skills. Skills like *Ways of Thinking, Ways of Working, Tools for Working, and Living in the World* matters a lot for every individual in the 21st century as these are considered as the key drivers for an individual's success. If this is the need for the world in 2030, how are we chemistry teachers aligned to it? What is our strategy of teaching the subject Chemistry for the inculcation of those four skills to ensure our student's success in the future? In addition to International assessments like TIMSS and PISA, our students' performance is abysmally low, because they lay enormous emphasis on interdisciplinary understanding, and our schools are not designed for such complex yet important skills in teaching-learning practices in our country. Therefore, interdisciplinary understanding through teaching Chemistry seems not only vital for students' conceptual clarity but also necessary for developing learning *'how to learn* the subject attitude in them.

Chemistry is destined to be more closely involved with the society in this century which is evidenced by the way our lifestyle is changing at a rapid pace. Chemistry attempts both to understand the structures and characteristics of substances in minute details at the atomic and molecular levels, and to create new compounds with desirable properties and functions *(Noyori, 2005)*. One clear direction, both now and in the future, of this core science is to merge with other fields to produce more interdisciplinary science. In view of its significance,

Chemistry demands the highest level of scientific creativity and insight to explore its limitless possibilities. However, over a period of time, it has lost its glory in our country. Many studies have tried to explain why students, when leaving upper secondary school, are not interested in taking Chemistry at the tertiary level. The low interest has, of course, not only one cause but is attributed to a number of different reasons. The other reason could be fact-based education system had to move to a skilled-based conception characterized by the process- rather than content orientation. Therefore, teaching Chemistry should aim to inculcate in students, the skills to find information for themselves, communicate their ideas in many ways, think imaginatively, tackle problems, test solutions, and that they learn how to learn.

SUBJECT-SPECIFIC VOCABULARY

Words are a constant in a given discipline. They are most often and definitely necessary to comprehend, use, and communicate the content of a given domain or discipline. Language is necessary for reading, writing, listening and speaking about the content. Also frequently used and repeated as the language of the discipline.

To understand Chemistry is to decode language that is used in Chemistry. Chemistry is the language of molecular level which has been deduced from experimental science. So how we observe and perceive the world is crucial to understanding the subject. The language of Chemistry allows us to transcend the barrier of culture and language. In fact, Chemistry is the universal language of matter and it allows the scientific community to communicate and understand the workings of matter. For instance, the oxidation number concept helps us to assign the naming to an inorganic substance. The language of Chemistry does not limit our personal thoughts, while it may be true that it may influence our thinking in such a way that we can conceptualize the complex concept of matter in a simpler way. The language of Chemistry is not limiting our thought rather it is ever-expanding and evolving in order to accommodate the developments in chemical sciences. Similar is the case for other subjects such as mathematics, English, Science, Biology, Accountancy, History, etc.

INTERDISCIPLINARY APPROACH IN TEACHING

The approach in which the curriculum generates an understanding of themes and ideas that cut across disciplines (say Physics and Chemistry) and of the connections between them and their relationship to the real world. The essential traits of the approach are-

- It is more or less process-driven (with the help of combining contents, theories, methodologies, and perspectives from two or more disciplines) rather than product-driven.
- Sometimes it leads the path towards a Cross-curricular approach wherein content is covered across subjects

(or disciplines or themes), rather than being taught and learned in one particular subject area.

- This approach connects *content across disciplinary boundaries; enriches the curriculum without overloading it through the introduction of additional teaching subjects; and facilitates interdisciplinary thinking and collaborative learning.*
- Interdisciplinary science also results from two sciences working together (Mackenzie, 2020). Blending the disciplines results in a powerful product involving critical thinking, planning, innovation, and creativity.

UNDERSTANDING' IS THE CORNERSTONE OF LEARNING CHEMISTRY

Delor's Report (1996), WHO Life skills and OECD study lays stress on Learning to Know, Learning to Do, Learning to Live Together and Learning to Be through critical skills called Decision-Making and Problem-Solving, Creative Thinking and Critical Thinking, Communication and Interpersonal Skills which are vital for 21st-century learners. Therefore teaching Chemistry without developing skills is like disabling future scientists and academicians.

Building background knowledge around the words is critical to comprehension, Provides support during reading and writing, Assesses students' understanding of words and concepts, etc. Vocabulary instructions bring terminology that really helps students to think, talk, and write about their content knowledge so they can live and learn inside words. Most educators believe that vocabulary instruction is critical in any classroom. The issue is not whether we should have vocabulary instruction, but how to make that vocabulary instruction have meaning beyond assigned word lists are a matter of concern. Hence teaching Chemistry vocabulary effectively is a matter of concern for all Chemistry teachers to connect Chemistry with the life of learners.

INTERDISCIPLINARY APPROACH IN TEACHING CHEMISTRY:

There are some topics in Chemistry and Physics like the States of Matter, Units and measurements, significant figures, mole concept, nuclear physics, Thermodynamics, Kinetic theory of gases, Nano Physics, Electrochemistry, Energy sources, Semiconductors, Atomic structure, chemical bonding, IUPAC nomenclature, Colloids and surface chemistry, particle physics, Solutions, and many processes like Oxidation, reduction, Vaporization, sublimation, crystallization, radioactivity, evaporation, centrifugation, condensation, surface tension, convection, open system, closed systems, photoemission, Environmental issues and Biotechnology-Principles & process in Biology etc. which needs a high degree of interdisciplinary understanding. Therefore teachers need to cater to the needs of students who study Chemistry, Biology and Physics as separate subjects in class 12 and at the UG level.

Further research and theory strongly suggest that teaching vocabulary is synonymous with teaching background knowledge. The packets of information that constitute our background knowledge all have labels associated with them. The more students understand these terms, the easier it is for them to understand the information they may read or hear about the topic. So is the Chemistry vocabulary and its understanding are correlated with each other.

RATIONALE

1. Besides the problem of relevance, there is a belief that science (Chemistry) is very difficult to study and there is also an apparent curriculum overload in science courses.
2. There is a strong relationship between reading comprehension and vocabulary knowledge is strong and unequivocal (Bauman & Kame'enui, 1991)
3. Good vocabulary instruction helps children gain ownership of words, instead of just learning them well enough to pass a test. Good vocabulary instruction provides multiple exposures through rich and varied activities to meaningful information about the word (Stahl & Kapinus, 2001).
4. Misconceptions and problems with models and modelling are often mentioned as important impediments for students. Concerning models, (i.e. molecular models, energy level diagrams, crystal field splitting diagram) many different areas within Chemistry have been studied and problems with visualization of models have been established in understanding the relationships.
5. Interdisciplinary learning in science is considered as a perspective that integrates two or more disciplines into coherent networks to enable students to make relevant connections and generate meaningful associations.

Therefore it is inferred that first of all we have to learn about emerging challenges associated with Chemistry and thereafter we have to discuss what can be done to improve the current situation with the help of Chemistry vocabulary to ensure students pursue Chemistry at the tertiary level.

ESSENTIAL QUESTIONS

1. When does learning vocabulary start? What does learning vocabulary mean? How is vocabulary learned?
2. What is the relationship between vocabulary growth and reading comprehension?
3. How does vocabulary learning in Chemistry develop an inter-disciplinary understanding of the subject and help students in describing their own experiences?

REVIEW OF RELATED LITERATURE

The lack of relevance in Chemistry has been studied from many different starting points. *Aalsvoort (2004)* has

analyzed Chemistry education from two different theoretical perspectives, activity theory and logical positivism, and shows that the former has a potential to connect knowledge with practice which makes Chemistry more functional, multi-perspective, and situated. The latter helps in the self-construction of knowledge. In our country, the 10+2 education is in the mesh as it is attached to colleges in some states and in schools in another state. Thus it is neither school nor college and it has created huge conceptual misunderstanding in the subject of Chemistry.

SMU Graduate Studies (2018) says there is growing recognition for the need for interdisciplinary thinking in Chemistry in recent years and it has shifted focus away from the traditional way of teaching Chemistry as Physical, Organic and General Chemistry to more experimental efforts in the areas of overlap between Chemistry and other fields. Learning Chemistry in an interdisciplinary manner helps students to translate their knowledge and background into wider career paths and fields of research.

METHODS

In Chemistry, there are many abstract concepts and principles that students find it many difficult to understand and retain for a longer period of time. Also in Chemistry, there are too many facts in the form of preparations, properties, reactions, formulae, equations, uses, etc. are presented which make it difficult for the student to grasp and assimilate the right perspective. The author suggests that some **simple conceptual vocabulary** in Chemistry can be used effectively to make students interact in class and retain their understanding of the subject longer. This method requires the teacher to identify conceptual vocabulary from a given topic with the help of students and guide them to master those conceptual vocabularies with the help of vocabulary games in order to develop 360° understanding about it. These conceptual vocabularies do not involve a quantitative problem but are simply a means for evoking the engaging discussion in the class, as opposed to presenting it as a lecture. Here are a few examples of Chemistry vocabularies and their pedagogical implications in table -1.

Table 1: Chemistry Vocabularies and its Pedagogical Implications

Vocabularies	Pedagogical Implications
General Academic Examples: analyze, cite, compare, determine, develop, recount, restate, summarize *(e.g. combined gas laws)*	▪ These words are aimed at cognitive action and are widely used, in the instructional process. Teachers need to explain those process-centric words to develop a wider understanding among students. ▪ The words should be used in classroom activities, in-depth discussions, learning tasks, and tests to assist students to get a proper connection with the subject.

Vocabularies	Pedagogical Implications
Domain/Discipline Specific Science: formulate, hypothesis, observation	▪ These words are associated with the 'How' part of Chemistry and should be used by the teachers to take students through Chemistry and arrive at independent understanding. These are critical for integrating Bloom's taxonomy in class to enable students to elicit their own thoughts on Chemistry.
Topic-Specific: (Electrochemistry): endothermic, exothermic, electrolyte, half-cell, redox reaction, fuel cell	▪ These words are critical to the comprehension and communication of information about electrochemistry. So direct instruction and guided practice about how the words connect to the topic or concept would be necessary. Explaining these words with proper examples and making their connection with the topic helps the learner to develop a big picture around the subject.

The author identified 30 Key Subject Vocabulary in Chemistry from the class 12 Chemistry by taking students to feedback on keywords in Chemistry that are highlighted in NCERT textbooks during the academic year 2018-19. Also, the author personally interacted with the students of classes 11 and 12 informally to know the difficulty in understanding Chemistry and many of them said there are some words in Chemistry that prevent their compression. The author discussed **20** conceptual vocabularies that are found common in Chemistry and Physics/Biology with the help of *Anagram* and *Acrostic* games, which have helped students to broaden their understandings in both subjects.

Acrostic Game:

An acrostic is a form of a short poem in which the first letter of each line forms the word, which usually depicts the title of the poem. The acrostic techniques are an effective strategy to support the poetry writing skills of school-going students as they are learning science in the most abstract manner.

How to create acrostics?

For creating any acrostics follow these steps:

1. Decide what to write about (any topic/concept/sub-concept. (e.g. **ISOMER**)
2. Write the word / Key concept down vertically

   I- (any idea)

   (any connection to Isomerism)

   O- (any word related to Isomerism)

   M- (any clues)

   E- (any word)

   R- (connects entire sentence)

3. Brainstorm words or phrases that describe your idea about the topic/ concept(ISOMER)

4. Place your brainstormed words or phrases on the lines that begin with the same letters vertically **(I-S-O-M-E-R).**

5. Fill in the rest of the lines to create a poem. If possible give a picture for the line matching the theme/word/ phrase/concept under consideration. Finally, it looks like-

I ***I****ons of Polyatoms or Molecular species that forms*

S ***S****tereoisomers*

O ***O****ptical Isomers and few of having*

M ***M****edicinal values, sometimes called*

E ***E****nantiomers which is produced due to*

R ***R****otation around single /double bonds*

These Chemistry vocabularies are correlated with examples with Physics/ Biology to develop interdisciplinary understanding about it which is given in the table-2.

Table 2: General Chemistry lecture concepts and corresponding in-class Physics-Biology related examples

Chemistry lecture Concepts	Physics/Biology-related examples
Isotope: The species (atoms or ions) have the same atomic numbers but different mass numbers. It is due to different numbers of neutrons in their nuclei. For example, $^{1}_{1}H, ^{2}_{1}H, ^{3}_{1}H$	Examples of Uranium isotopes used for the nuclear power plants for the generation of nuclear energy and their use in the development of atom bombs are discussed to connect it with Physics.
Isothermal: It is a process in which the temperature of a system remains constant which means the transfer of heat into or out of the system happens so slowly and thermal equilibrium is maintained.	Heat engines and 1st Law of Thermodynamics
Isobar: The Species (atoms/ions) have the same mass number but different atomic numbers. $^{40}_{19}K$ and $^{40}_{20}Ca$	**Isobar** (Thermodynamics): A curve representing a physical system at constant pressure.

Chemistry lecture Concepts	Physics/Biology-related examples
Isoelectric point: It is the pH at which a molecule carries no net electrical charge or is electrically neutral in the statistical mean.	Capillary electrophoresis
Isochore: A line on a graph showing the variation of temperature of a fluid with its pressure, when the volume is kept constant. Any change with respect to pressure and temperature when the volume is kept constant.	Thermodynamics Cp-Cv= R
Isotonic: A solution having the same osmotic pressure as some other solutions, especially one in a cell or a body fluid. Used in solution Chemistry chapter	Thermodynamics
Isotone: Nuclides having the same neutron number (N) but the different atomic number(Z) Boron-12 and Carbon-13	Atomic Physics
Isoelectronic: Species (neutral atom, cationic and anionic) Atoms having the same numbers of electrons or the same electronic structures Ne, Na^{+}, Mg^{2+} $Al^{3+,}$ etc.	Semiconductor devices
Isobaric: It is a thermodynamics process in which the pressure stays constant e.g. Boiling of water in an open container.	Thermodynamics and thermal properties of matter
Isochoric process: It is a process in which the volume of the closed system undergoing such a process remains constant. For example Heating of a gas in a closed cylinder.	Thermodynamics and thermal properties of matter
Isothermal: It is the thermodynamics process in which the temperature of a system remains constant. The transfer of heat into or out of the system happens so slowly that thermal equilibrium is maintained.	Used in Carnot's cycle for efficiency of heat engine

Chemistry lecture Concepts	Physics/Biology-related examples
Isolated system: It is a thermodynamic system that cannot exchange either energy or matter outside the boundaries of the system. If soup is poured into an insulated container and closed, there is no exchange of heat or matter.	Newton's law of cooling and Calorie meter
Isosmotic: Having the same osmotic pressure Physiological saline is isosmotic with body saline.	In Biology for measuring cell pressure
Isometric: Two molecular entities that are superposable or can be made superposable by the reflection of one of them in a mirror.	In mechanical bodies of solids like rigid bodies and crystal bodies
Isomorphism: Two or more substances having different chemical compositions but the similarity in the crystalline structure. In a group of minerals known as garnets, which can vary in chemical composition but always have the same crystal structure.	Solid-state physics
Isochromatic: Substances having the same wavelength (colour). For example two series of oval curves of the interference figures of biaxial crystals.	Interferences and diffraction
Isodose: A relative to points or zones in a medium that receive equal doses of radiation. fOI 250kV x rays and for cobalt-60 gamma rays. Isodose charts commonly refer to principal planes.	Nuclear Physics in chapter- Nuclei,& atoms
Isomerization: It is a process in which one molecule is transformed into another molecule that has exactly the same atom, but the atom has a different arrangement. A-B-C B-A-C	Cis-Platin and Trans-platin in Biology
Isomers: Each of the two or more compounds with the same formula but a different arrangement of atoms in the molecule and different properties.	Cisplatin is used for curing cancer

IMPLEMENTATION, ASSESSMENT, AND OUTCOME

Implementation of the Chemistry vocabulary was carried out with examples from Physics/Biology over one term of the academic year. The assessment included student responses on their current attitudes about enriched-chemistry teaching blended with Physics/Biology. The author collected qualitative feedback from all 27 students of class 12 Science and three teachers from the school. It was analyzed by using qualitative methods.

MAJOR FINDINGS

- Students could able to assimilate the meaning of the word with the context it is used in the textbook.
- know the different meanings of vocabularies
- being able to pronounce it properly
- being able to use it correctly within a sentence in an appropriate grammatical form
- recognized it in the context in the textbook
- Students said 'Everything comes together for us. We don't go to Chemistry and then Physics / Biology chapters separately and study something totally different. All the concepts' come together"; "I'm learning more because there is a flow to what we are studying.

PEER TEACHER OBSERVATION AND FEEDBACK

Three teachers (one is Physics & Biology and the other one is Chemistry laboratory assistant) shared their feedbacks in the given format. The summary of their feedback can be read as:

- It is an effective tool for deeper understanding and conceptual learning
- Students correlate these conceptual keywords and word meanings given in their textbooks and find interesting connections.
- Helped to understand the question better manner and responded effectively.
- Few students made subject-wise dictionaries by writing conceptual vocabularies and their meanings for their own reference. It helped in improving peer interaction

WAY FORWARD

- School teachers must plan at least one unit of study in their subjects in collaboration with another subject teacher during the academic year and should invest their time and energy in developing cohesive understanding among subjects for which careful planning of curriculum at the beginning of the academic year is required.
- The school academic leadership should show genuine interest to offer interdisciplinary understanding to students through rigorous instructional planning and empowerment of teachers through professional development sessions.

- Topics like Climate change, population, food production & management, pollution, and other critical topics can be taught in an interdisciplinary manner which will benefit individuals engaging in collaborative learning.

CONCLUSION

By using subject-specific vocabularies in Chemistry, the author helped students to activate their prior knowledge and experience. Also, it encouraged students to make a personal connection between Chemistry vocabularies in the textbook with concepts more systematically. The interdisciplinary approach resulted in the greater involvement of students in the classroom discussion, contribute to teamwork and critical thinking, and they took responsibility for developing and sharing their ideas. Therefore we can conclude that once students start to develop their Chemistry vocabulary, their scores on science assessments will improve, as well as their confidence and enthusiasm for learning in the subject will develop consequently.

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STUDENTS PERCEPTION TOWARDS CONTINUOUS AND COMPREHENSIVE EVALUATION

3

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INTRODUCTION

The Indian Education System has seen a number of innovations before and after independence. Our educational system has improved from time to time according to social needs and requirements and become one among major manpower exporting countries of the world. Our Government has attempted to evaluate the standard of education so that it will be helpful in fulfilling the national objectives. For this endeavour several committees have been cannoned. Their observations have been incorporated in to our education system.

Examination, a pivotal role player in the system of assessment, are indispensable part of the educational process as some form of assessment is necessary to determine the effectiveness of the dissemination of knowledge by teachers and its assimilation by students (Kumar, 2003). The strength and success of an educational system depends on a sound examination system. In the last decades, several educational experts analyzed "evaluation" of the present education system. Considering the recommendations of various commissions and committees the internal assessment, semester system, continuous and comprehensiveness of the assessment process and grading emerged as the prime areas of concern in context of examination reforms. To overcome the drawbacks in the evaluation system and to tests students understanding, application, skill, analytical and synthesis abilities, it is necessary to understand the prevalent reforms in the system so as to be able to suggest improvement measures.

Perception is a psychological process whereby individual experiences are organised into a meaningful conscious whole that is representative of some object, situation or happening that is present before the perceiver. Analytically we may speak of sensations and perceptions but experientially awareness of sensations and their mental interpretation happen almost simultaneously. We may even term it as sense perception. Education is not concerned with the mass of sensations but mainly concerned with

the child's perception of world of things and relations.

Evaluation and assessment, social psychology, clinical psychology and educational policy development and management which led to productive research which refined the theories of development, learning instruction, assessment and evaluation and built up an increasingly detailed picture of how students learn and became an essential part of the training of teachers, who for several generations were instructed in the theories emanating from its research to help train them in class room teaching practice.

Continuous and Comprehensive Evaluation (CCE) focuses on holistic development of learners which brings out the strengths and weakness of learners. It provides feedback to the teachers for modifying their teaching strategies wherever necessary. It also includes both scholastic and co-scholastic aspects. Scholastic assessment refers to evaluation of all academic subjects over the entire period of learning which covers the learner's knowledge, understanding, analysis and application of content assessed through multiple tools and techniques. Physical Education (PE) is considered as an integral part of co-scholastic assessment which addresses the life skills, co-curricular activities, attitude and values and wellness and holistic exercise.

NEED AND SIGNIFICANCE OF THE STUDY

Indian Educational system has introduced Continuous and Comprehensive Evaluation (CCE) by which evaluates the entire progress of the students. Continuous Evaluation can bring about renewal of motivation, effective classroom teaching and learning; develop relationship with students and colleagues, sharing ideas and problems and development in the atmosphere of a school. It can also decrease a teacher's sense of efficacy. The ultimate aim of education is to bring a change in the behaviour of pupils which occurs by teaching the students various school subjects.

The process of behaviour such as learning, maturation and perception are significant in our life because they contribute to the process of adjustment. The way we interact with people depends to a great extent upon how we perceive them and how we interpret their behaviour. Social perceptions on new concepts are initially based on the information we obtain about it and in some cases the attribution we make about the causes for the behaviour. The present study brings out the perception of upper primary school students towards the present Evaluation system CCE in Gobichettipalayam Educational District, Erode District.

REVIEW OF RELATED LITERATURE

The review of related literature gives a brief sketch of the researches carried out in the field of Perception and Continuous and Comprehensive Evaluation in India and abroad.

Linda Kwok (2008) aimed at gauging students' perceptions of peer evaluation in a seminar discussion by a group of second-language university learners and positively viewed the experience of peer evaluation of a seminar as it can enhance their group work and confidence.

Nurun Nahar et.al., (2010) conducted a study on "Students' Perception of Educational Environment of Medical Colleges in Bangladesh" were found that students' academic self perception and lowest score in students' perceptions of atmosphere and social self perceptions. Gender wise comparison showed higher score among female student's than male and the difference was highly significant.

Murat Ozdemir, Hakki Kalayci (2013) examined and analyzed 410 high school students from ten different schools relationship between school engagement and metaphorical school perceptions of students based on sex, type of school and grade. Arithmetical mean, standard deviation, percentage, *t*-test, MANOVA and multivariate regression analysis techniques were used. Results showed that students' were moderate in school engagement and positive school perception. Significant differences were found in the variables such as sex, type of school and grade.

Jadal (2011) conducted a study on the "Effect of continuous & comprehensive evaluation on student's (VII std.) attainment at primary level in English subject". From the analysis of the result, it was showed that systematic and well planned CCE has profound allegation on the attainment of the learning achievement of the learners.

Sanjeev Sonawane and Madhuri Isave (2012) has studied the Continuous Comprehensive Evaluation Scheme at secondary level. Thirty secondary school teachers were selected from three Marathi medium schools. Analysis was done into two parts that is Scholastic and Co-scholastic area of evaluation. The present study concluded that, evaluation practices are carried out in school. Daily and formative feedback, lack of daily record maintenance is found. Teachers did not prepare their own evaluation tools and it is perceived as a hectic process for them.

A thorough analysis of the related literature was made use of in exploring the significance of the construct the perception tools on CCE. Related studies have exposed the crucial role of evaluation system for national development. CCE system was found to have relevance on both scholastic and co-scholastic areas of students. The search of literature reflects that CCE is significantly related to variables like attitude.

OBJECTIVES OF THE STUDY

- To know the perception of upper primary school students towards Continuous and Comprehensive Evaluation in Gobichettipalayam Educational District with respect to their personal variables such as
  a) Sex
  b) School Type
  c) Medium of Instruction
  d) School Location
  e) School Kind
  f) School management
  g) Family Type
  h) Mother's Educational Qualification
  i) Father's Educational Qualification

HYPOTHESES OF THE STUDY

- There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation with respect to
  a) Sex
  b) School Type
  c) Medium of Instruction
  d) School Location
  e) School Kind
  f) Family Type
  g) Mother's Educational Qualification
  h) Father's Educational Qualification

DESIGN OF THE STUDY

The present study employed survey method by assigning samples randomly to groups and used identical measures to assess the outcomes of each group. Out of the sixty six Educational District spread over 33 districts of Tamil Nadu, the investigator selected Gobichettipalayam Educational as the field of study.

The structure of curriculum of education is same (10+2+3) however; it is that there is a remarkable variation in the syllabus and course content. Among the above structure, more number of students are studying under the State Board of Secondary Education system by adopting the same curricula and syllabi in English or Tamil (Regional Language) as the medium of instruction. Hence the researcher selected the State Board of Secondary Education schools for the study. Considering the nature of the research and feasibility of conducting study, the samples in the school education (Upper primary to higher secondary schools) were selected for the study.

DEFINITIONS OF KEY TERMS USED IN THE STUDY

Perception: Here, perception refers to understanding and interpreting of CCE by the upper primary school students.

Continuous and Comprehensive Evaluation (CCE): It is a system of school based evaluation of a student that covers all aspects of a student development. It is a developmental process of student which emphasizes on two fold objectives. These

objectives are continuity in evaluation and assessment of broad based learning and behavioural outcomes on the other.

Students: A person who is formally engaged in learning especially enrolled at a school or other place of higher education. Here a student refers to the person who learns in upper primary school in Erode District.

Erode District: Erode District is one of the most opulent agricultural districts of the state of Tamil Nadu in India. Erode is well known for turmeric cultivation, hence it is called as "Turmeric City".

Table 1: The Distribution of Samples

S. No	Variable	Category	Students	
			Boys	Girls
1	**School Type**	Middle School	48	65
		High School	54	102
		Higher Secondary School	126	105
		Total	228	272
2	**School Management**	Government	89	73
		Aided	110	122
		Private	29	77
		Total	228	272
3	**Medium of Instruction**	Tamil	199	171
		English	29	101
		Total	228	272
4	**School Location**	Rural	88	107
		Urban	140	165
		Total	228	272
5	**School kind**	Boys only	91	0
		Girls only	0	108
		Co- Education	137	164
		Total	228	272

VARIABLES

If a hypothesis and its deducted consequences are well conceived, two factors are precisely identified.

Dependent variable

Perception of Continuous and Comprehensive Evaluation

Independent variable (Personal Variable)

Sex, School Type, Medium of Instruction, School Kind, Locality, School Management, Academic and professional Qualification Teaching Experience, Family Type, Mother's Educational Qualification and Father's Educational Qualification.

ADMINISTRATION OF FINAL STUDY PROCEDURE AND TOOL

Student's perception of CCE tool consists of sixty six items. The scale consists of four factors described in below with item wise.

Table 2: Factor wise distribution of items

S. No.	Factors	Item Numbers
1	General information's about CCE	1 to 10
2	Formative Assessment [FA(a)]	11 to 23
3	Formative Assessment [FA(b)]	25 to 33
4	Co scholastic	34 to 66

The response sheet for the final study is a five point scale which are Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree. Each item consists 5, 4, 3, 2, and 1 for positive questions. 1, 2, 3, 4 and 5 for negative items. The items are listed in table, maximum scores is 330 minimum score 66.

Table 3: Scoring of items

S. No.	Positive items	Negative items
1	1,2,5,6,7,8,11,14,15,19,21,22, 23,25,30,32,36,37,38,39,40,41, 42,43,46,47,48,49,50,51,53,55, 56,57,58,59,62,65,66.	3,4,9,10,12,13,16,17,18,20, 24, 26,27,28,29,31, 33, 34,35, 44,45,52,54,60,61,63,64.

RESULTS OF THE STUDY

Table 4: Descriptive Statistics of Perception towards Continuous and Comprehensive Evaluation (CCE) among Students

S.No	Sample	Mean	Median	Mode	SD	Skewness	Kurtosis
1	Students	234.68	236.00	236	17.49	-0.18	-0.42

The statistical measures of the dependent variable presented in the above Table 4 were scrutinized to decide whether the distributions of the variable was normal or departed very much from normality, since the assumption of normality is implied in many of the later analysis. The proximity of the Measures

of central tendency (Mean, Median, Mode), Standard Deviation and the Co-efficiency of Skewness and Kurtosis were examined separately for Students. This revealed that the distribution of the variable has not departed much from normality.

HYPOTHESIS: 1

There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their gender.

Table 5: Mean score, SD and *t*-value of Perception towards CCE among upper primary school boys and girls students.

Group	N	Mean	SD	*t*-value	Significant level
Boys	228	229.79	16.10	5.91	Significant
Girls	272	238.77	17.59		

**Correlation is significant at the 0.05 level (2-tailed)

From Table 5, it is understood that the calculated *t*-value (5.91) is greater than the table value (2.59) at 0.01 level of significance. Hence the formulated hypothesis "There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their gender" is rejected. It is also observed that the mean score of girls is greater than that of the boys which shows that perception towards CCE is more. Hence, it is concluded that the upper primary school girl students have better perception of CCE than the boys.

HYPOTHESIS: 2

There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their School type.

Table 6: F value of Perception towards CCE among upper primary school students.

Source of variation	Sum of Squares	df	Mean Squares	F	Significant level
Between group	841.443	2	420.721	1.38	Not Significant
Within groups	151938.069	497	305.710		
Total	**152779.512**	**499**			

From Table 6, it is understood that the calculated F value (1.38) is less than the table value (2.99) at 0.05 level of significance for df = 497. Hence the formulated hypothesis "There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their School type" is accepted.

It is also observed that the mean score of upper primary school students have no significant difference in the perception of CCE with respect to their School type. Hence, it is concluded that the upper primary school students do not differ in the perception of CCE.

HYPOTHESIS: 3

There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their Medium of Instruction.

Table 7: Mean score, SD and *t*-value of Perception towards CCE among Tamil and English Medium upper primary school students.

Group	N	Mean	SD	*t*-value	Significant level
Tamil Medium	370	232.88	17.31	3.93	Significant
English Medium	130	239.78	17.07		

From Table 7, it is understood that the calculated *t*-value (3.93) is greater than the table value (2.59) at 0.01 level of significance. Hence the formulated hypothesis "There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their Medium of Instruction" is rejected.

It is also observed that the mean score of English Medium upper primary school students is greater than that of Tamil medium. Hence, it is concluded that the Tamil medium upper primary school students have better perception of CCE with respect to their Medium of Instruction.

HYPOTHESIS: 4

There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their School location.

Table 8: Mean score, SD and *t*-value of Perception towards CCE among Rural and Urban upper primary school students.

Group	N	Mean	SD	*t*-value	Significant level
Rural	195	237.45	16.62	2.86	Significant
Urban	305	232.90	17.84		

From Table 8, it is understood that the calculated *t*-value (2.86) is greater than the table value (2.59) at 0.01 level of significance. Hence the formulated hypothesis "There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their School location" is rejected.

It is also observed that the mean score of rural upper primary school students is greater than that of urban upper primary

school students in their perception of CCE. Hence, it is concluded that the rural upper primary school students have better perception of CCE with respect to their School location.

HYPOTHESIS : 5

There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their School kind.

Table 9: F value of Perception towards CCE among Unisex (only Boys and only Girls) and Co-education upper primary school students.

Source of variation	Sum of Squares	df	Mean Squares	F	Significant level
Between group	7434.105	2	3717.053	12.71	Significant
Within groups	145345.407	497	292.445		
Total	**152779.512**	**499**			

From Table 9, it is understood that the calculated F value (12.71) is greater than the table value (2.99) at 0.01 level of significance for df = 497. Hence the formulated hypothesis "There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE with respect to their School kind" is rejected.

It is also observed that the mean score of Co-education upper primary school students is greater than that of Unisex (only boys and only girls) upper primary school students in their perception of CCE. Hence, it is concluded that the Co-education upper primary school students have better perception towards CCE than the unisex.

HYPOTHESIS: 6

There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their family type.

Table 10: Mean score, SD and *t*-value of Perception towards CCE among Nuclear and Joint family upper primary school students.

Group	N	Mean	SD	*t*-value	Significant level
Nuclear Family	396	234.74	17.53	0.15	Not Significant
Joint Family	104	234.44	17.44		

From Table 10, it is understood that the calculated *t*-value (0.15) is less than the table value (1.96) at 0.05 level of significance. Hence the formulated hypothesis "There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their Family type" is accepted.

It is also observed that the mean score of the both family types have equal perception towards CCE. Hence, it is concluded that the students of nuclear and joint family do not differ in their perception of CCE.

HYPOTHESIS: 7

There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their Father's Educational Qualification.

Table 11: F-ratio of Perception towards CCE among upper primary School students on the basis of Father's Educational Qualification (Illiterate, School Education and Collegiate Education).

Source of variation	Sum of Squares	df	Mean Squares	F	Significant level
Between group	275.874	2	137.937	0.45	Not Significant
Within groups	152503.638	497	306.848		
Total	152779.512	499			

From Table 11, it is understood that the calculated F value (0.45) is less than the table value (2.99) at 0.05 level of significance for df=497. Hence the formulated hypothesis "There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their Father's Educational Qualification" is accepted.

It is also observed that the mean score of upper primary school students has no significant difference in the perception towards CCE with respect to their Father's Educational Qualification. Hence, it is concluded that the upper primary school students do not differ in the perception of CCE.

HYPOTHESIS: 8

There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their Mother's Educational Qualification.

Table 12: F-ratio of Perception towards CCE among upper primary School students on the basis of Mother's Educational Qualification (Illiterate, School Education and Collegiate Education).

Source of variation	Sum of Squares	df	Mean Squares	F	Significant level
Between group	54.307	2	27.153	0.088	Not Significant
Within groups	152725.205	497	307.294		
Total	152779.512	499			

From Table 12, it is understood that the calculated F value (0.088) is less than the table value (2.99) at 0.05 level of significance for df = 497. Hence the formulated hypothesis "There is no significant difference in the perception of upper primary school students towards Continuous and Comprehensive Evaluation (CCE) with respect to their Mother's Educational Qualification" is accepted.

It is also observed that the mean score of upper primary school students has no significant difference in the perception towards CCE with respect to their Mother's Educational Qualification. Hence, it is concluded that the upper primary school students do not differ in the perception of CCE.

DISCUSSION AND CONCLUSION

The present study analyses the Perception of Continuous and Comprehensive evaluation among students indicated that CCE has helped the students to know the level of knowledge attainment through the classroom activities. It can be reasoned out that CCE system enhances and enriches the students to participate in learning. This system motivates and improves their progress in every activity and tests conducted by the teachers. It can also help to learn by them in an easy manner.

The significant differences were noticed in the mean scores of students with respect to gender, school management, school kind and medium of instruction. It can be reasoned out that the students from tamil medium and rural area have mother tongue and peer group influence to involve and actively participate in their classroom activities. The students from the rural area are more familiar with their home town. So, they spend more time for co-curricular activities (sports and games) where physical education is an integral part of the scholastic area.

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DEVELOPING A TOOL TO MEASURE THE TEACHER EFFECTIVENESS OF HIGHER SECONDARY TEACHERS

4

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INTRODUCTION

Teacher effectiveness is over and over again defined as the ability to produce gains in student achievement scores. This prevailing concept of teacher effectiveness is far too narrow (Olivia Little, 2009). Teachers are not exclusively responsible for students' learning. An individual teacher can make a huge impact; however, student learning cannot reasonably be attributed to the activities of just one teacher, it is influenced by a host of different factors. Other teachers, peers, family, home environment, school resources, community support, leadership, and school climate all play a role in how students learn.

Effective teachers are those who achieve the goals which they set for themselves or which they have set for them by others. As a consequence, those who study and attempt to improve teacher effectiveness must be cognizant of the goals imposed on teachers or the goals that teachers establish for themselves, or both. Which factors contribute to teacher effectiveness? Fortunately, there has been a convergence of the available research data pertaining to this question over the past 20 years. Some of these factors fall under the general heading of 'teacher characteristics'. Teacher characteristics are relatively stable traits that are related to, and influence, the way teachers practice their profession. The teacher characteristics identified by Hay Mcber (2000) based on a large-scale study conducted in the United Kingdom are as follows.

- Commitment to do everything possible for each student and enabling all students to be successful
- Belief in one's ability to be effective and to take on challenges
- Ability to think logically, break things down, and recognize cause and effect
- Ability to identify patterns and connections, even when a great deal of detail is present

- Relentless energy for setting and meeting challenging targets for students
- Ability and willingness to adapt to the needs of a situation and change tactics
- Drive and ability to support students in their learning, and to help them become confident and independent learners

Approaches to Evaluating Teacher Effectiveness

A Research Synthesis presents a five-point definition of teacher effectiveness developed through an analysis of research, policy, and standards that addressed teacher effectiveness. After the definition had been developed, the authors consulted a number of experts and strengthened the definition based on their feedback.

The five-point definition of teacher effectiveness consists of the following:

- Effective teachers have high expectations for all students and help students learn, as measured by value-added or other test-based growth measures, or by alternative measures.
- Effective teachers contribute to positive academic, attitudinal, and social outcomes for students such as regular attendance, on-time promotion to the next grade, on-time graduation, self-efficacy, and cooperative behaviour.
- Effective teachers use diverse resources to plan and structure engaging learning opportunities; monitor student progress formatively, adapting instruction as needed; and evaluate learning using multiple sources of evidence.
- Effective teachers contribute to the development of classrooms and schools that value diversity and civic-mindedness.
- Effective teachers collaborate with other teachers, administrators, parents, and education professionals to ensure student success, particularly the success of students with special needs and those at high risk for failure" (Goe et al., 2008)

Defining Teacher Effectiveness

The way teacher effectiveness is defined impacts how it is conceived and measured and influences the development of education policy. Teacher effectiveness, in the narrowest sense, refers to a teacher's ability to improve student learning as measured by student gains on standardized achievement tests. Although this is one important aspect of teaching ability, it is not a comprehensive and robust view of teacher effectiveness. Teacher effectiveness is generally referred to in terms of a focus on student outcomes and the teacher behaviours and classroom processes that promote better student outcomes.

LITERATURE REVIEW

Although there has been a considerable amount of research over the years in the area of teacher effectiveness, there is still little consensus about how to define and identify effective teaching.

One of the reasons for the different opinions about teaching effectiveness is that teaching is such a complex, multidimensional, and idiosyncratic process. (Jac J. Andrews, 2004).

Teachers are one of the key elements in any school and effective teaching is one of the key propellers for school improvement. This review is concerned with how to define a teacher's effectiveness and what makes an effective teacher. It draws out implications for policy makers in education and for improving classroom practice (James Ko, 2013).

Researchers agree that teachers are one of the most important school-based resources in determining students' future academic success and lifetime outcomes (Chetty et al. 2014; Rivkin et al. 2005; Rockoff 2004). As a consequence, there has been a strong emphasis on improving teacher effectiveness as a means to enhancing student learning. Goe (2007), among others, defined teacher effectiveness in terms of growth in student learning, typically measured by student standardized assessment results. Chetty et al. (2014) found that students taught by highly effective teachers, as defined by the student growth percentile (SGPs) and value-added measures (VAMs), were more likely to attend college, earn more, live in higher-income neighbourhoods, save more money for retirement, and were less likely to have children during their teenage years. This potential of a highly effective teacher to significantly enhance the lives of their students makes it essential that researchers and policy makers properly understand the factors that contribute to a teacher's effectiveness. However, as we will discuss in more detail later in this report, studies have found mixed results regarding the relationships between specific teacher characteristics and student achievement (Wayne and Youngs 2003). In this study, researcher explore these findings, focusing on the five main dimensions of teacher effectiveness identified namely, subject matter expertise, personality, social, professional competencies and teaching style of teachers.

OBJECTIVES OF THE STUDY

The main objective of the study is to develop a research tool to measure the teacher effectiveness of higher secondary teachers.

As such it seems that there is no research tool to measure the teacher effectiveness with five dimensions in the Indian perspective and the researcher intended to construct a tool.

METHODOLOGY

In this research the concept teacher effectiveness was identified with reference to five dimensions namely subject matter expertise, personality, social, professional competencies and teaching style of teachers.

In order to develop the research tool at the preliminary stage the researcher consulted the experts on teacher education, the teachers who have put considerable years of teaching experience at higher secondary level, literatures on teacher effectiveness and also surfed web

sites and gathered information. Based on the information gathered as many as 54 statements were developed. The response of the tool was of 5 point Likert scale with the responses totally agree, agree, undecided, disagree and totally disagree. The responses were given the weightage of 5, 4, 3, 2 and 1.

The tool was administered on 100 higher secondary teachers working in higher secondary schools. Data collected from the higher secondary teachers were scored carefully. Based on the scores, the tools were arranged in the descending order from the highest to the lowest. The highest 27% and lowest 27% of the respondents were taken for item analysis.

ITEM ANALYSIS

In order to select the reliable items, the researcher has used three statistical measures namely *t*-value, Kolmogorov-Smirnov test and Cronbach's Alpha test. To select the items the research tools collected from higher secondary teachers were arranged on the basis of the scores in the decreasing order of magnitude. The highest 27 and lowest 27 of the respondents were identified. Totally 54 samples were taken into consideration for the analysis. Then for the higher group and the lower group the individual test item scores were scored. Using the Kolmogrov Smirnov test, the equality of mean scores was tested. The mean scores that differed significantly were retained (Guilford, J.P. 1965). The Kolmogorov Smirnov test value for those items significant at 0.01 level were considered for the final tool.

The Cronbach's Alpha value was calculated for the two sets of scores for each statement. The item with the Cronbach's Alpha value greater than 0.5 were retained and less than 0.5 were not considered. Further, to establish the significance of the test items, the *t*-value were calculated. The *t*-value for the statements greater than the table value at 0.05 level has been taken into consideration.

The statements of the final tool were established based on the statistical treatments namely Cronbach's Alpha test value ranging from 0.789 to 0.994, Kolmogorov Smirnov test value ranging from 1.927 to 4.532 and *t*-value ranging from 4.09 to 12.11. Out of the 54 statements 42 statements were found to be statistically valid. The final version of the tool entitled "Teacher Effectiveness of Teachers" consists of 42 statements. The tool consists of five point scale where by a respondent can score a maximum of 210 and a minimum score of 42.

RELIABILITY AND VALIDITY

The Reliability coefficient of the tool was ascertained by using the split half method, which was found to be 0.82 which is valid. In the beginning of the process of tool construction the selected statements were given to experts on educational psychology and educational philosophy as well as in the field of teacher education testing for their approval. They judged the appropriateness of the statements. The statements were modified with their suggestions prior to administration and thereby the content validity was ensured.

CONCLUSION

The tool outlines the dimensions available to measure teacher effectiveness and discusses the utility of these dimensions for addressing specific aspects of teaching. In addition to that, the tool provides recommendations for improving teacher evaluation systems. At the end the research tool indicates that a well-conceived system should combine dimensions to gain the most complete understanding of teacher effectiveness.

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MOVING TOWARDS TEACHER LEADERSHIP: LEADERSHIP AWARENESS OF PRE-SERVICE TEACHERS

5

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INTRODUCTION

Teacher leadership plays an important role in the modification of teacher behaviour which influences their personal as well as professional competence; thereby have an impact on the behaviour modification of students. Teacher leaders contribute to important decisions and actively initiate advances in school policy and practice. Highly successful teachers develop an ambitious and concrete vision for students' progress. The successful leadership practices improve students' outcomes through their values, virtues, dispositions, attributes and competences as well as what they do in terms of the strategies they select and the ways in which they adapt their leadership practices to their unique context in order to achieve the excellent performance (Caldwell, 1992).

Leadership training plays a vital role in developing the teacher leadership skills of both in-service and pre-service teachers. During the pre-service training, the focus of training is mainly concentrated on enhancing teaching skills. But leadership theories and studies (Ticky & Devanna, 1986; Ruebling, Stow, Kayona & Clarke, 2004.; Harris, 2012; Goddard, Goddard, Kim & Miller, 2015; Samriangjit, Tesaputa & Somprach, 2016) show that a teacher needs essential leadership skills to act as a teacher leader inside and outside the classroom rather than a teacher. So, during the pre-service training itself one should be aware about what the teacher leadership is. It will help the pre-service teachers to identify their teacher leadership skills and to make use of it effectively during their classroom teaching.

The topic leadership has been addressed since long back and it is very important to identify the variables relevant to effective leadership. Gender is one of the such variables which is very much relevant to effective teacher leadership and should be examined for optimizing leadership awareness and effectiveness. Even though many teachers

are coming forward nowadays to become a teacher leader, it is mainly confined to one who is very much closely associated with the administrators and decision makers. Many are not very aware about what a teacher leader is. There may be many reasons like they may not be much aware about different teacher leadership models, they may receive better teacher leadership training during their pre-service and in-service training programme, the environment where they live or the institution from where they received teacher training may influence their outlook towards teacher leadership etc.

As the pre-service training is the entry level training for a person to become an effective teacher, the researcher decided to select pre-service teachers as the sample for the study to examine the pre-service teachers' awareness towards teacher leadership. In this regard the present study is aimed to analyse the leadership awareness of pre-service teachers with regards to their gender, locality where they are living and the type of management of the teacher education institution where they are pursuing their teacher education programme.

OBJECTIVES

The main objectives of the study are

- to categorize the pre-service teachers into different levels of awareness based on their teacher leadership awareness test scores
- to study the level of teacher leadership awareness of pre-service teachers based on their gender, locality and the type of management

To study the level of teacher leadership awareness of pre-service teachers based on their gender, locality and the type of management the null hypotheses used are

1. There exists no significant association between the levels of teacher leadership awareness of pre-service teachers and their gender
2. There exists no significant association between the levels of teacher leadership awareness of pre-service teachers and their locality
3. There is no significant association between the levels of teacher leadership awareness of pre-service teachers and type of management

METHODOLOGY

In order to study the levels of teacher leadership awareness of pre-service teachers based on their gender, locality and the type of management, a descriptive survey method was used. The sample consisted of 160 pre-service teachers studying B.Ed. in Teacher Education Institutes in Kerala state. The tool used for the present study consisted of the Teacher Leadership Awareness Test developed by Sabeena and Muthaiah (2018). The data collected was analysed using the statistical techniques Chi-square test and correspondence analysis.

ANALYSIS AND INTERPRETATION OF THE RESULT

The researcher categorized the pre-service teachers into three different levels namely low, average and high level of awareness. The low level of awareness group consisted of pre-service teachers whose scores on the Teacher Leadership Awareness Test were below the value of (mean - standard deviation) of the total sample. The average level of awareness group consisted of pre-service teachers whose scores on the Teacher Leadership Awareness Test was between the value of (mean - standard deviation) and (mean + standard deviation) of the total sample. The high level of awareness group consisted of pre-service teachers whose scores on the Teacher Leadership Awareness Test was above the value of (mean + standard deviation) of the total sample. Table 1 shows the number and percentage of pre-service teachers based on their Teacher Leadership Awareness Test Scores.

Table 1: Categorization of Teacher Leadership Awareness Test Score into Levels

	Low	Average	High
No of scores	25	116	19
Percentage	15.6	72.5	11.9

From Table 1, it is clear that out of 160 pre-service teachers, 25 (15.6%) belong to the low awareness group, 116 (72.5%) belong to the average awareness group and 19 (11.9%) belong to the high awareness group.

Chi-square test is used to find the significant association between the levels of teacher leadership awareness of pre-service teachers and their gender.

Table 2: Cross tabulation between the levels of teacher leadership awareness of pre-service teachers and their gender

Gender	Level of teacher leadership awareness			
	Low	Average	High	Total
Male	3	7	3	13 (8.1%)
	23.1%	53.8%	23.1%	100%
Female	22	109	16	147 (91.9%)
	15%	74.1%	10.9%	100%
Total	25	116	19	160 (100%)

The result shows that among 13 (8.1% of the total) male pre-service teachers, 23.1% have a low level of teacher leadership awareness, 53.8% have an average level of teacher leadership awareness & 23.1% have a high level of

teacher leadership awareness. Among 147 (91.9% of the total) female pre-service teachers, 15% have a low level of teacher leadership awareness, 74.1% have an average level of teacher leadership awareness & 10.9% have a high level of teacher leadership awareness. The chi-square test for association between the levels of teacher leadership awareness of pre-service teachers and their gender is presented in Table 3.

Table 3: Chi-square test for association between the level of teacher leadership awareness of pre-service teachers and their gender

	Value	df	Asymp. Sig. (2 sided)
Pearson Chi-square	2.677[a]	2	0.262
Likelihood Ratio	2.383	2	0.304
Linear-by-linear Association	0.072	1	0.788
No. of Valid Cases	160		
a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.54			

Chi-square test reveals that there is no significant association between the level of teacher leadership awareness of pre-service teachers and their gender, χ^2 (2) = 2.677, $p \leq 0.05$. Hence the null hypothesis 'There exists significant association between the levels of teacher leadership awareness of pre-service teachers and their gender'is accepted.

Chi-square test is used to find the significant association between the levels of teacher leadership awareness of pre-service teachers and their locality.

Table 4: Cross tabulation between the levels of teacher leadership awareness of pre-service teachers and their locality

Locality	Level of teacher leadership awareness			
	Low	Average	High	Total
Urban	18	67	11	96 (60%)
	18.8%	69.8%	11.4%	100%
Rural	7	49	8	64 (40%)
	10.9%	76.6%	12.5%	100%
Total	25	116	19	160 (100%)

The result shows that among 96 (60% of the total) pre-service teachers from urban areas 18.8% have a low level of teacher leadership awareness, 69.8% have

an average level of teacher leadership awareness & 11.4% have a high level of teacher leadership awareness. Among 64 (40 % of the total) pre-service teachers from rural areas 10.9% have a low level of teacher leadership awareness, 76.6% have an average level of teacher leadership awareness & 12.5% have a high level of teacher leadership awareness. The chi-square test for association between the levels of teacher leadership awareness of pre-service teachers and their locality is presented in Table 5.

Table 5: Chi-square test for association between the level of teacher leadership awareness of pre-service teachers and their locality

	Value	df	Asymp. Sig. (2 sided)
Pearson Chi-square	1.778[a]	2	0.411
Likelihood Ratio	1.846	2	0.397
Linear-by-linear Association	1.093	1	0.296
No. of Valid Cases	160		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.60.			

Chi-square test reveals that there is no significant association between the level of teacher leadership awareness of pre-service teachers and their locality, χ^2 (2) = 1.778, $p \leq 0.05$. Hence the null hypothesis 'There is no significant association between the levels of teacher leadership awareness of pre-service teachers and their locality' is accepted.

Correspondence analysis is used to find the significant association between the levels of teacher leadership awareness of pre-service teachers and the type of management.

Table 6: Correspondence table for level of teacher leadership awareness of pre-service teachers and the type of management

Type of Management	Level of teacher leadership awareness			
	Low	**Average**	**High**	**Active Margin**
Government & aided	3	15	1	19 (11.88%)
	15.8%	78.9%	5.3%	100%
Unaided	19	64	11	94 (58.75%)
	20.2%	68.1%	11.7%	100%
University Centres	3	37	7	47 (29.37%)
	6.4%	78.7%	14.9%	100%
Active Margin	25	116	19	160 (100%)

Correspondence table shows that out of 160 pre-service teachers, 11.88% are studying in government & aided teacher education institutes. Among these, 15.8% have a low level of teacher leadership awareness, 78.9% have an average level of teacher leadership awareness & 5.3% have a high level of teacher leadership awareness. Out of 160 pre-service teachers, 58.75% are studying in unaided teacher education institutes. Among these, 20.2% have a low level of teacher leadership awareness, 68.1% have an average level of teacher leadership awareness and 10.4% have a high level of teacher leadership awareness. Out of 160 pre-service teachers, 29.37% are studying in University Teacher Education centres. Among these 6.4% have a low level of teacher leadership awareness, 78.7% have an average level of teacher leadership awareness and 14.9% have a high level of teacher leadership awareness.

Table 7: Summary table for correspondence analysis between level of teacher leadership awareness of pre-service teachers and the type of management

Dimension	Singular Value	Inertia	Chi Square	Sig. Accounted for	Proportion of Inertia		Confidence Singular Value	
					Cumulative	Standard Deviation	Correlation	
1	.170	.029			.837	.837	.063	.088
2	.075	.006			.163	1.000	.060	
Total		.034	5.511	.239a	1.000	1.000		
a. 4 degrees of freedom								

Summary table of correspondence analysis shows that there is no significant association between the levels of teacher leadership awareness of pre-service teachers and the type of management, $\chi^2(4) = 5.511$, $p \leq 0.05$. Hence the null hypothesis 'There is no significant association between the levels of teacher leadership awareness of pre-service teachers and the type of management' is accepted.

The statistical analysis showed that the variables gender, locality and the type of management have no significant association with the levels of teacher leadership awareness of pre-service teachers. But it is evident from the result that even though there is no significant association between the variables, it is found that majority of the pre-service teachers (72.5%) are having average level of awareness about teacher leadership irrespective of (i) whether they are male or female, (ii) whether they are living in urban area or rural area, or (iii) whether they are studying in the teacher

education institution run by different managements. Present study showed that the factors like gender, locality and type of management do not have significant association with that of their level of teacher leadership awareness. It mainly depends on the training they receive during their pre-service programme. Ado (2016) in his study on pre-service teachers' teacher leadership analysed pre-service teachers' conceptions of teacher leadership and found that the pre-service teachers showed deeper understandings of concepts associated with teacher leadership as a result of participating in the leadership course. But he could find significant gaps in their understandings. The pre-service teachers' leadership awareness can be enhanced by participating them actively in leadership training.

CONCLUSION

Recent studies stress the need to include teacher leadership training in the teacher education programme (Bond, 2011; Ado, 2016; Sheppard, Wolfinger & Talbert, 2020). Studies on teacher leadership also focus on the need for a continuum of preparation and support, beginning at the pre-service level and continuing throughout teaching profession (Katzenmeyer & Moller, 2009; York-Barr & Duke, 2004) So, it should be incorporated in the teacher education programmes giving due weightage to teacher leadership models and practice. Teacher leaders have many leadership roles in and outside the classroom which will recognize them as a teacher leader. If pre-service teachers are properly trained, they could perform their roles in a well manner thereby they could become a successful social engineer. During pre-service leadership training, theories and models related to teacher leadership should be incorporated in the training along with its practical application. This will help to enhance the leadership awareness of pre-service teachers which they could apply in the real time teaching in future thereby leading them to become successful teacher leaders.

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A STUDY ON ATTITUDE TOWARDS MORAL VALUES AND EMOTIONAL MATURITY AMONG PROSPECTIVE TEACHERS IN VELLORE DISTRICT

6

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INTRODUCTION

Our emotions play quite a significant role is guiding and directing our behaviour. Many a times they seem to dominate human in such a way that have no solutions. On the other hand, if a person has no emotions in him, then he becomes crippled in terms of living his life in a normal way. In this way, emotions play a key role in providing a particular direction to our behaviour and thus shaping our personality. It is obvious that moral values are important aspects in human life since it represents what happens in society individually or in group. Many experts and researchers state that moral values are important aspects at school. Ma (2009) says that Educators in Chinese society regards moral values in education as the most important aspect where some essential concepts of moral values and moral education become major issues and are being discussed among educators.

METHODOLOGY ADOPTED

The investigator has used normative survey method for this research work

VARIABLES OF THE STUDY

The following are the variables which the investigator has taken for this study,

Dependent variable:

Emotional Maturity and Moral Values

Independent variables:

The following are the independent variables considered for the present study. They are gender, locality and the type of family.

TOOLS USED FOR THE STUDY

1. Moral value scale (Reliability = 0.65 & Validity – Construct Validity)
2. Emotional Maturity Scale (Reliability = 0.73 & Validity – Construct Validity)

STATISTICAL TECHNIQUES PERFORMED

The investigator has performed the following statistical techniques

1. Descriptive Statistics (Mean, Standard Deviation)
2. Differential Statistics (*t*-test)

OBJECTIVES OF THE STUDY

The following are some of the objectives of the study

1. To study the level of emotional maturity of the prospective teachers.
2. To study the level of moral values of the prospective teachers
3. To know whether there exists any significance difference in the moral values with regard to Gender
4. To know whether there exist any significance difference in the moral values with regard to Locality.
5. To know whether there exist any significance difference in the moral values with regard to Type of Family.
6. To know whether there exist any significance difference in the emotional maturity with regard to Gender
7. To know whether there exist any significance difference in the emotional maturity with regard to Locality.
8. To know whether there exist any significance difference in the emotional maturity with regard to Type of Family.

ANALYSIS OF THE STUDY

1. The level of Emotional Maturity of the prospective teachers is high.
2. The level of Moral Values among the prospective teachers is moderate.

Hypothesis 1

There is no significant difference in emotional maturity of prospective teachers with respect to Gender

Table 1: Emotional Maturity of prospective teachers with respect to Gender

Dependent Variable	Gender	N	Mean	Std. Deviation	Std. Error Mean	t value
Emotional Maturity	Male	56	152.79	11.101	1.483	0.921
	Female	194	151.16	13.192	0.947	

From the above Table 1, it is clear that the t value is 0.921 which is lesser than the tabulated value 1.96 at 5% level of significance. Hence, the null hypothesis, "There is no significant difference in Emotional maturity with respect to Gender" is accepted.

The Mean value of Male prospective teacher is higher than the mean value of female prospective teachers. Hence, male prospective teachers are emotionally matured when compared to that of female prospective teachers.

Null Hypothesis 2

There is no significant difference in moral values of prospective teachers with respect to Gender.

Table 2: Moral Values of prospective teachers with respect to Gender.

Dependent Variable	Gender	N	Mean	Std. Deviation	Std. Error Mean	*t*-value
Moral Values	Male	56	58.18	2.943	0.393	1.909
	Female	194	59.10	3.876	0.278	

From the above Table 2 it is clear that the *t*-value is 1.909 which is lower than the tabulated value 1.96 at 5% level of significance. Hence, the null hypothesis, "There is no significant difference in moral value with respect to Gender" is accepted.

The Mean value of female prospective teachers is higher than the mean value of male prospective teachers. Hence, female prospective teachers have high morals when compared to that of male prospective teachers.

Hypothesis 3

There is no significant difference in emotional maturity of prospective teachers with respect to Locality of college

Table 3: Emotional Maturity of prospective teachers with respect to Locality of college

Dependent Variable	Locality of College	N	Mean	Std. Deviation	Std. Error Mean	t value
Emotional Maturity	Rural	84	149.80	13.698	1.495	0.761
	Urban	112	151.23	12.142	1.147	

From the above Table 3, it is clear that the t value is 0.761 which is lower than the tabulated value 1.96 at 5% level of significance. Hence, the null hypothesis, "There is no significant difference in emotional maturity with respect to Locality of the college" is accepted.

The Mean value of prospective teachers studying in urban area is higher than the mean value of prospective teachers studying in rural areas. Hence,

prospective teachers studying in urban area have high emotional maturity when compared to that of prospective teachers studying in rural areas.

Hypothesis 4

There is no significant difference in moral values of prospective teachers with respect to Locality of college

Table 4: Moral Values of prospective teachers with respect to Locality of college

Dependent Variable	Locality of College	N	Mean	Std. Deviation	Std. Error Mean	t value
Moral Values	Rural	84	59.45	3.250	0.355	2.868
	Urban	112	57.99	3.873	0.366	

From the above Table 4, it is clear that the t value is 2.868 which is lower than the tabulated value 1.96 at 5% level of significance. Hence, the null hypothesis, "There is no significant difference in moral value with respect to Locality of the college" is rejected.

The Mean value of prospective teachers studying in rural area is higher than the mean value of prospective teachers studying in urban areas. Hence, prospective teachers studying in rural area have high moral when compared to that of prospective teachers studying in urban areas.

Hypothesis 5

There is no significant difference in Emotional maturity with respect to type of family

Table 5: Emotional Maturity of prospective teachers with respect to type of family

Dependent Variable	Type of Family	N	Mean	Std. Deviation	Std. Error Mean	t Value
Emotional Maturity	Joint Family	141	151.01	13.484	1.136	0.737
	Nuclear Family	109	152.19	11.761	1.127	

From the above Table 5, it is clear that the t value is 0.737 which is lesser than the tabulated value 1.96 at 5% level of significance. Hence, the null hypothesis, "There is no significant difference in Emotional maturity with respect to type of family" is accepted.

The Mean value of prospective teachers in nuclear family is higher than the mean value of prospective teachers in joint family. Hence, prospective teachers in nuclear family are emotionally matured when compared to that of prospective teachers in joint family.

Hypothesis 6

There is no significant difference in moral values with respect to type of family

Table 6: Moral Values of prospective teachers with respect to Type of Family

Dependent Variable	Type of Family	N	Mean	Std. Deviation	Std. Error Mean	t Value
Moral Value	Joint Family	141	58.56	3.487	.294	1.562
	Nuclear Family	109	59.32	3.937	.377	

From the above Table 6, it is clear that the t value is 1.562 which is lesser than the tabulated value 1.96 at 5% level of significance. Hence, the null hypothesis, "There is no significant difference in moral values with respect to type of family" is accepted.

The mean value of prospective teachers in nuclear family is higher than the mean value of prospective teachers in joint family. Hence, prospective teachers in nuclear family have high morals when compared to that of prospective teachers in joint family.

FINDINGS OF THE STUDY

The investigator after analysing the data collected from the prospective teachers in Vellore district, has arrived the following findings. They are as follows,

1. The level of Emotional Maturity of the prospective teachers is high.
2. The level of Moral Values among the prospective teachers is Moderate.
3. There is no significant difference in emotional maturity of the prospective teachers with respect to gender.
4. There is no significant difference in moral values of the prospective teachers with respect to gender.
5. There is no significant difference in emotional maturity of the prospective teachers with respect to Locality of the college.
6. There is a significant difference in moral values of the prospective teachers with respect to Locality of the college.
7. There is no significant difference in emotional maturity of the prospective teachers with respect to Type of family.
8. There is no significant difference in moral values of the prospective teachers with respect to Type of Family.

CONCLUSION

The investigator after performing the research in the topic has concluded that the prospective teachers in Vellore district have good emotional maturity. The investigator has also found that the moral values among the prospective teachers can be improved. The suggestions for the improvement of both emotional maturity and moral values have to be adopted so as to shine in this competitive world. Since, the role of the teacher is very important in shaping the personality of the students, it is always necessary to see that the teacher should be well trained not only in academic aspects, but also in emotional maturity.

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CRITICAL THINKING DISPOSITION AND SKILL AS FACTORS OF ACADEMIC PERFORMANCE AMONG HIGHER SECONDARY SCHOOL STUDENTS

7

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INTRODUCTION

Contemporary cognitive psychology regards human reasoning as a complex process which is both reactive and reflective. The teaching of thinking is acknowledged by many as an important goal of education and underlying this view is a conception of what constitutes good thinking. Good thinking consists of a cluster of well-developed creative and critical thinking skills.

John Dewey is just one of many educational leaders who recognized that a curriculum aimed at building thinking skills would be a benefit not only to the individual learner, but also to the community and to the entire democracy. A holistic approach to the teaching of thinking-skills should be considered essential if we want to empower students with 'the skills they need to adapt to change, to handle the information explosion in our environment and to face the challenging years ahead' (McGrath & Noble, 1995).

The schooling process has to enable students to develop thinking skills and questioning abilities. It implies that thinking is one of the basic abilities that need to be developed. The thinking processes can be developed if a teacher is sensitive to the fact that he has the responsibility to work for all round development of the personality of the children.

Critical Thinking

Critical thinking is best understood as the ability of thinkers to take charge of their own thinking. This requires that they develop sound criteria and standards for analyzing and assessing their own thinking and routinely use those criteria and standards to improve its quality (Elder, L. and Paul, R, 1994).

All students, regardless of social class or presumed limitations in ambition or ability have some degree of potential to think critically. This potential can be developed to the fullest by embedding critical thinking in the core curriculum.

Students' capabilities to think critically are likely to be increased if they practice strategies and skills systematically and extensively and in a manner that is consistent with their cognitive development and prior learning experiences. Subject specific teaching of critical thinking may be the most effective means to develop students' abilities to transfer skills and solve problems in life outside of school. By contrast, separate courses on critical thinking seem to be rather weak means of developing cognitive strategies and skills.

Critical thinking is about being both willing and able to evaluate one's thinking. The relationship between critical thinking skills and critical thinking disposition is an empirical question. Some people have both in abundance, some have skills but not the disposition to use them, some are disposed but lack strong skills, and some have neither of the two.

Critical Thinking Components: Dispositions and Skills

1. **Disposition** - the motivation, inclination and drive of the learner to involve her/himself in meaningful critical thinking while dealing with thinking about issues, making decisions and/or solving problems (P.A.Facione, N.C. Facione and Giancarlo, 1996). Dispositions are attitudinal in nature and develop over time. They are influenced by significant adults, peers and environmental factors. Dispositions are strong forerunners of critical thinking although they can be changed, they change slowly over time.

Dispositions are the gateways through which one allows the mind to engage in critical thinking activity. With low–level dispositions, one would be less likely to entertain complex questions, look for multiple solutions, question decisions, or seek solutions to meaningful problems. It is important to assess not only critical thinking skills, but also students' disposition towards critical thinking, since they may point to the tendency of the learner to actually apply critical thinking in different contexts.

A good thinker possesses certain abilities: cognitive capabilities, as well as thinking strategies and skills. Yet what sets good thinkers apart is not simply superior cognitive ability or particular skills; rather, it is their abiding tendencies to explore, to inquiry, to seek clarity, to take intellectual risks, to think critically and imaginatively. These tendencies can be called 'thinking dispositions.'

2. **Skills** - the ability to analyse, evaluate and make inferences. Critical thinking skills give students the ability to not only understand what they have read or been shown but also to build upon that knowledge without incremental guidance. It is not simply rote memorization or the ability to absorb lessons unquestioningly. Critical thinking encourages students to think for themselves, to question hypotheses, to develop alternative hypotheses, and to test those hypotheses against known facts.

If our students want to be both willing and able to engage in critical thinking, it

should be included both in school and professional development curricula, in our instructional assignments, and in our educational outcomes assessments. Because being skilled does not assure one is disposed to use critical thinking and being disposed toward critical thinking does not assure that one is skilled.

The forms of 'thinking' that schools have traditionally valued and taught have been confined to logic, analysis and argument; and the teaching of those equally important but missing, components of thinking such as the creative, the lateral, the reflective and the generative, have all but been neglected (de Bono, 1999: McGrath, 1998). It is clear that the new educational paradigm demands 'thinking, independent learners' and in order to create this profile among the students, educators themselves are being invited to consider appropriate strategies to facilitate the expected outcomes. Gagne also supported the argument that 'the central point of education is to teach people to think, to use their rational powers, to become better problem solvers' (Gagne, 1985). Creating a classroom with a strong thinking culture encourages students to develop good thinking dispositions, skills and habits of mind.

By adolescence, boys and girls have reached what Piaget called the stage of formal operations in cognitive ability. They are now capable of considering all possible ways of solving a particular problem and can reason on the basis of hypotheses or propositions. Thus they can look at their problems from several points of view and can take many factors into account when solving them. It is infact the highest stage of intellectual functioning, the stage at which one's thought processes are said to be functioning to the maximum at the most advanced level. Therefore, the investigator selected the students from Standard XI and XII for the study.

This study attempts to find the relationship between critical thinking disposition, critical thinking skill and academic performance of standard XI and XII students. In studying the variables critical thinking disposition, critical thinking skill and academic performance, certain personal variables were taken into account. They were gender, order of birth, number of siblings, number of family members, father's educational qualification, mother's educational qualification, father's occupation, mother's occupation and family income.

METHOD OF STUDY

Normative method is employed in the present study. The study intends to collect data pertaining to the students' critical thinking disposition, critical thinking skill and their academic performance.

SAMPLE AND SAMPLING TECHNIQUE

Sampling techniques and population parameters are of paramount importance and become critical factors in the success of the study. In the present study, 21 schools were selected from three districts

namely Chennai, Kancheepuram and Thiruvallur in Tamil Nadu by giving due representation to the Management of the school. In this study, 928 students from Grades XI and XII were selected randomly.

TOOLS USED

1. Critical Thinking Disposition questionnaire developed by the Investigator.
2. Critical Thinking Skill test developed by the Investigator.

STATISTICAL TECHNIQUES USED FOR DATA ANALYSIS

The data collected were analysed with respect to the objectives and hypotheses of the study. The SPSS (version 18.0) was used for the analysis. In the present study following statistical techniques were adopted to analyse the pilot and final study data.

1. Item Analysis (Pilot Study).
2. Stepwise Multiple Correlation and Regression Analysis.
3. Discriminant Function Analysis.

DATA ANALYSIS AND INTERPRETATION

Stepwise Multiple Correlation and Regression Analysis

Regression is the determination of statistical relationship between two or more variables. To study the correlation of independent variables (personal, school related and research variables) with dependent variable (academic performance) stepwise multiple correlation coefficients (R) was calculated. In order to study the contribution of the said independent variables towards academic performance, stepwise regression analysis was made. The variables and the codes used in the stepwise multiple correlation and regression analysis are given as gender (X_1), order of birth (X_2), no. of siblings (X_3), no. of family members (X_4), father educational qualification (X_5), mother educational qualification (X_6), father occupation (X_7), mother occupation (X_8), family income (X_9), medium of instruction (X_{10}), group (X_{11}), type of management (X_{12}), board of affiliation (X_{13}), district (X_{14}), inquisitiveness (X_{15}), open-mindedness (X_{16}), systematicity (X_{17}), truth seeking (X_{18}), self confidence (X_{19}), cognitive maturity (X_{20}), metacognition (X_{21}), creativity (X_{22}), classroom activities (X_{23}), analysis (X_{24}), inference (X_{25}), evaluation (X_{26}), academic performance (Y).

Table 1: Results of Multiple Correlations of Independent Variables with Classroom Students' Academic Performance

S. No.	Variables	Code	R	R^2	df1	df2	F-ratio	Level of Significance
1	Inference	X_{25}	0.191	0.190	1	926	218.03	P<0.001
2	Analysis	X_{24}	0.481	0.232	2	925	139.59	P<0.001
3	Group	X_{11}	0.514	0.264	3	924	110.71	P<0.001
4	District	X_{14}	0.541	0.293	4	923	95.61	P<0.001
5	Medium of Instruction	X_{10}	0.556	0.309	5	922	82.36	P<0.001
6	Truth seeking	X_{18}	0.563	0.317	6	921	71.11	P<0.001
7	Evaluation	X_{26}	0.568	0.323	7	920	62.66	P<0.001
8	Mother Educational Qualification	X_6	0.573	0.328	8	919	56.04	P<0.001

Multiple R = 0.573 Multiple R^2 = 0.328

Out of 26 variables entered, eight variables were found significant correlates of students' academic performance. Research variables like truth seeking, inference, analysis and evaluation, School related variables like group, medium of instruction and district, Personal variable Mother's educational qualification made significant contributions towards students' academic performance. These variables together had contributed to the extent of 33% of variance in the academic performance. The regression equations formed were

$$Y = 1.605 X_{25} + 0.933 X_{24} + 3.154 X_{11} - 2.253 X_{14} - 3.119 X_{10} + 0.231 X_{18} + 0.677 X_{26} + 1.573 X_6 + 58.069 \text{ --- Raw Score Form}$$

$$Y = 0.234 X_{25} + 0.137 X_{24} + 0.192 X_{11} - 0.162 X_{14} - 0.130 X_{10} + 0.085 X_{18} + 0.089 X_{26} + 0.081 X_6 \text{ --- Standard Score Form}$$

Discriminant Function Analysis

Discriminant Function Analysis is concerned with developing a linear equation to distinguish two are more apriori groups from each other, that is to develop a mathematically precise discriminant function based upon a set of variables or attributes. Discriminant analysis attempts to use the independent variables and research variables to distinguish among the groups or categories of the dependent variable.

For this study, the entire sample of 928 students was classified into low, average and high groups on the basis of their academic performance scores. The cut-off criterion of M ± 1σ [mean (M) = 75.11 and standard deviation (σ) = 11.82] was followed for classifying the students. Thus 188, 569 and 171 students were classified as low, average and high groups.

Table 2: Summary of Discriminant Function Analysis

Step No.	Variable Code	Entered	Removed	Variables in	Wilks Lambda	Level of Significance	MinimumD-Squared Significance	Between Groups
1	X_{25}	Inference	---	1	0.814	P<0.001	0.717	2&3
2	X_{24}	Analysis	---	3	0.771	P<0.001	0.871	2&3
3	X_{14}	District	---	4	0.744	P<0.001	0.890	2&3
4	X_{23}	Classroom Activities	---	5	0.735	P<0.001	0.889	2&3
5	X_{16}	Open-mindedness	---	6	0.727	P<0.001	0.963	2&3
6	X_{13}	Board of Affiliation	---	7	0.717	P<0.001	0.866	2&3
7	X_{12}	Type of Management	---	8	0.711	P<0.001	0.907	2&3
8	X_{11}	Group	---	8	0.675	P<0.001	0.975	2&3

The Stepwise Discriminant Analysis began with 26 variables. Among these variables, eight variables were found to be significant on the basis of Wilks Lambda and Mahananobis-D-Square. Out of eight significant discriminating variables, four were school related variables (group, type of management, board of affiliation and district) and four were research variables (open-mindedness, classroom activities, analysis and inference). It can be understood that all the eight variables had very well discriminated the students with high from average academic achievers.

Fisher's Linear Discriminant Function

With a review to developing a linear discriminant function equation, Fisher's discriminant coefficients were calculated for those eight variables and are given.

Table 3: Fisher's Linear Discriminant Function Co-efficients

Sl. No	Code	Variables	Low Group (1)	Average Group (2)	High Group (3)
1	X_{11}	Group	1.739	2.728	2.591
2	X_{12}	Type of Management	12.604	12.455	13.131
3	X_{13}	Board of Affiliation	15.283	15.640	16.545
4	X_{14}	District	-1.210	-1.969	-2.406
5	X_{16}	Open-mindedness	1.269	1.363	1.322
6	X_{23}	Classroom Activities	0.528	0.518	0.589
7	X_{24}	Analysis	-0.315	-0.249	-0.014
8	X_{25}	Inference	1.112	1.507	1.881
Constant			-47.198	-49.865	-56.008

Using the results, three linear discriminant functions (equations) are drawn as given below.

$$Y_1 = 1.739 X_{11} + 12.604 X_{12} + 15.283 X_{13} - 1.210 X_{14} + 1.269 X_{16} + 0.528 X_{23} - 0.315 X_{24} + 1.112 X_{25} - 47.198$$

$$Y_2 = 2.728 X_{11} + 12.455 X_{12} + 15.640 X_{13} - 1.969 X_{14} + 1.363 X_{16} + 0.518 X_{23} - 0.249 X_{24} + 1.507 X_{25} - 49.865$$

$$Y_3 = 2.591 X_{11} + 13.131 X_{12} + 16.545 X_{13} - 2.406 X_{14} + 1.322 X_{16} + 0.589 X_{23} - 0.014 X_{24} + 1.881 X_{25} - 56.008$$

Table 4: Results of Canonical Discriminant Functions

Function	Eigen Value	Percentage of Variance	Cumulative Percentage	Canonical Correlation	After Function	Wilks Lambda	Chi- square	df	Level of significance
1	0.403	88.3	87.7	0.536	1	0.675	362.198	16	P<0.001
2	0.056	12.3	100.0	0.231	2	0.947	50.462	7	P<0.001

The Canonical Discriminant Co-efficient of function one and two were found to be 0.536 and 0.231 which are highly significant at P<0.001 level.

Table 5: Classification Results of the Sample

Actual Group	No of cases	Predicted Group Membership		
		High	Average	Low
High	171	46(26.9%)	123(71.9%)	2(1.2%)
Average	569	31(5.4%)	494(86.8%)	44(7.7%)
Low	188	1(0.5%)	111 (59.0%)	76(40.4%)
Total	928	78	728	122

Percentage of grouped cases correctly classified = 66.40%. No of cases correctly classified = 46+494+76 = 616.

The present Discriminant Function Analysis had correctly classified 616 out of 928 cases (66.40%). 125 out of 171 cases (High group) were wrongly classified (negatively classified). As many as 75 out of 569 cases (Average group) were wrongly classified i.e. 31 positively and 44 negatively. 112 out of 188 cases (Low group) were wrongly classified (positively classified).

$$Y_1 = 1.739\ X_{11} + 12.604\ X_{12} + 15.283\ X_{13} - 1.210\ X_{14} + 1.269\ X_{16} + 0.528\ X_{23} - 0.315\ X_{24} + 1.112\ X_{25} - 47.198$$

$$Y_2 = 2.728\ X_{11} + 12.455\ X_{12} + 15.640\ X_{13} - 1.969\ X_{14} + 1.363\ X_{16} + 0.518\ X_{23} - 0.249\ X_{24} + 1.507\ X_{25} - 49.865$$

$$Y_3 = 2.591\ X_{11} + 13.131\ X_{12} + 16.545\ X_{13} - 2.406\ X_{14} + 1.322\ X_{16} + 0.589\ X_{23} - 0.014\ X_{24} + 1.881\ X_{25} - 56.008$$

FINDINGS AND INTERPRETATION

The personal variables namely number of siblings, number of family members, father's educational qualification, mother's educational qualification, father's occupation, family income and school related variables namely medium of instruction, type of management, board of affiliation and district have significantly influenced critical thinking disposition, critical thinking skill and academic performance of the students.

The personal variables namely mother's educational qualification, school related variables namely subject group, district, medium of instruction and the dimension of critical thinking disposition namely truth seeking and the dimensions of critical thinking skill namely analysis, inference and evaluation have significantly contributed to the extent of 33% of variance in the academic performance. Of all these eight significantly contributing variables of academic performance, the highest contribution is made by inference (critical

thinking skill) and the least is made by evaluation (critical thinking skill).

Out of eight significant discriminating variables, four school related variables namely group, type of management, board of affiliation, district and four research variables namely open-mindedness, classroom activities, analysis and inference have very well discriminated the students with high from average achievers.

DISCUSSION

It is seen from the findings that in the regression analysis, apart from personal variables and critical thinking skill dimensions, only one dispositional dimension namely truth-seeking has made significant contribution towards students' academic performance. This is in accordance with the findings of Ku and Ho (2010). Hence more importance must be given in the developing the dispositional attributes of the students.

Also, the present findings show that there is no significant difference in the critical thinking disposition of students studying in different subject groups which is in relation with the findings of Qing et al. (2007). Also, students studying in science group have better critical thinking skills than the students of other subject groups. This is also in accordance with the findings of the Fenl (2000) and Qing et al. (2007). This may be due to interactive classroom practices, hands-on experiments and discussions of real-world problems.

In the present study, mother's educational qualification has strongly influenced the academic performance of students. This is in accordance with the study done by Fan and Chen (2001), where parental involvement had a positive influence on student's academic performance. Educated parents motivate their wards and provide necessary facilities to perform well.

Critical thinking skills are highly correlated with the academic performance of students. All the three critical thinking skills namely analysis, inference and evaluation have significantly contributed towards students' academic performance and this finding is supported by the study carried out by Yeh and Wu (1992).

RECOMMENDATIONS AND CONCLUSION

What the schools can contribute to the development of the student is of great importance. The school must first conceive the role, not as an agency, whose primary function is to impart knowledge but to provide quality education that would enable him to meet with all the challenges in life.

Teachers should use various instructional methods to promote critical thinking in the classroom. Effective peer group participation both inside and outside the class should be encouraged. A major factor in the growth of higher order thinking capability is a student-centred classroom. It supports the open expression of ideas, provides active modelling of thinking processes,

develops thinking skills, and motivates students to learn. Without it, students will not persist in higher level thinking processes. Socratic questioning, real-world problems, peer group discussions, debates, simulated environments and field trips not only provide opportunities to exhibit students' skill but also develop their learning abilities and higher order skills. With the available resources teachers must see that pupils make use of opportunities available to enhance their critical thinking.

If these objectives can be duly met, students can better internalize, analyze, and synthesize information because they will have arrived at an answer through their own rational thought processes. The hope is to teach students to transfer and internalize the thinking skills they learn, so that they will be better thinkers on their own, in a variety of contexts inside and outside of school.

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