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## Students' Perception about the Personal Contact Programme (PCP) of NIOS in Relation to their Personal Variables

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### Abstract

*Education is not only a fundamental need, it is also a dynamic phenomenon. It is no longer the privilege of the elite or particular age, it is reaching out to embrace the whole of humane society and the entire life of individual. There are many cannot afford formal schooling and many who have leave their education without to complete. So open school learning system of education is a important mean to fulfill the need of all. In open learning system, education is imparted by mailing the printed material followed by organization of personal contact programs. Hence in this paper the researcher examines in detail about the objective to study the students' perception about the Personal Contact Programme (PCP) of NIOS at the sr. secondary stage in relation to their personal variables e.g. (a.) medium of instruction; (b.) area (locality); (c.) gender (sex). In order to investigate, the researcher has purposively selected 132 physics students studying at senior secondary stage in NIOS as a sample and out of them 126 were responded. Further, he employed Perception Scale for Physics Students of NIOS (PSPS) for data collection and four way ANCOVA for analyzing the data. The main findings of the study were : (a.) medium of instruction differences more positively affects to the Hindi medium students' perception about Personal Contact Programme (PCP) than that of their English medium counter parts; (b.) Medium of instruction equally influences to both the urban & rural area students' perception as well as that of male and female students' perception about PCP. Further the sex and area differences hasn't any significant impact on senior secondary school students' perception about Personal Contact Programme (PCP).*

**Key Words** : Perception, Personal Contact Programme (PCP), NIOS, Personal Variables, Virtual Education, Sr. Secondary Stage, Critical Analysis etc.

**Introduction** : The main purpose of education is to make individuals according to need and nature of society. It preserves the culture of society and transmits to next generation. Education also transmits the perception, norms and practice of society to next generation. The process of education may take place through formal, informal and non-formal education. So there are several institutions such as state, schools, mass media, religious groups, peer group, family etc. engaged in the process of socialization.

After reviewing the related literature, it is found that many researches have been conducted in the area and they have created a lot of contradiction with their results. Where on one side some of the researchers reported that participation in co-curricular activities play a key role in students' academic success (Stephens & Schaben, 2002; Huang & Chang, 2004; Hunt, 2005), and contribute to bachelor's degree attainment (Tan & Pope, 2007). Students also realize the



importance of developing overall competences, by joining co-curricular activities and working collaboratively with their student peers on academic work in order to gain hands-on experience (Fung, Lee, & Chow, 2007). Co-curricular activities were positively correlated to academic performance (Hanks & Eckland, 1976; Camp, 1990). While on the other side some of the researchers found no such correlation between co-curricular involvement and academic performance (Light, 1990; Hartnett, 1965). One research finding suggested that only an academic curriculum would enhance academic performance (Chambers & Schreiber, 2004). It implied that the participation in some non-academic co-curricular activities might not directly benefit academic performance. Black (2002) suggested that involvement in student clubs and organizations might even distract students from their regular study, and not all activities were of benefit to academic performance. Here, the two opposing hypotheses have been proposed to explain the relationship between organized curricular & co-curricular activities and academic performance, academic success, attainment of proper knowledge, understanding, perceptions, skills and perception etc. Whether organized curricular & co-curricular activities enhance academic performance or distract students from their regular study and degrade their academic performance. The researcher found the same case with the Students' Perception about the Personal Contact Programme (PCP) of NIOS at the Sr. Secondary stage in Relation to their Personal Variables. Therefore, the following questions arose in the mind of the researcher:

- Whether Students' Perception about the Personal Contact Programme (PCP) of NIOS at the Sr. Secondary stage is independent of their medium of instruction?
- Whether Students' Perception about the Personal Contact Programme (PCP) of NIOS at the Sr. secondary stage is independent of their locality?
- Whether Students' Perception about the Personal Contact Programme (PCP) at Sr. Secondary stage is Independent of their gender?

In the light of above research question, the researcher has formulated the following objective:

- To study the Students' Perception about the Personal Contact Programme (PCP) of NIOS at the Sr. Secondary stage in Relation to their Personal Variables:
  - a. Medium of Instruction;
  - b. Area (Locality);
  - c. Gender (Sex);

**Hypotheses of the Study :** For obtaining the above research objective, the researcher has formulated the following null hypotheses :

H0.1. There is no significant difference between the mean scores of Hindi and English medium students' perception about the Personal Contact Programme (PCP) of NIOS at the Sr. secondary stage.

H0.2. There is no significant difference between the mean scores of urban and rural area



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students' perception about the Personal Contact Programme (PCP) of NIOS at the Sr. secondary stage.

H0.3. There is no significant difference between the mean scores of male and female students' perception about the Personal Contact Programme (PCP) of NIOS at the Sr. secondary stage.

### **Operational Definition of the Key Terms Used in the Study:**

- **Physics:-** The word physics is derived from the Latin word physics, which means "natural thing." It is the branch of science concerned with the nature and properties of matter and energy. The subject matters of physics includes mechanics, heat, light and other radiation, sound, electricity, magnetism, and the structure of atom.
- **Sr. Secondary Stage:** Sr. Secondary stage means Class XII, Which takes place after secondary; education, followed by higher education. Research was limited to Students of Class XII Science Stream only.
- **Perception:** The ability to see, hear, or become aware of something thought the sources. It is a way in which something is regarded, understood or interpreted. Here perception would be the view regarding items covered in interview schedule/check list. I questionnaire noise covering different dimensions of science curriculum. (Gold star,' E. Bruce Lee 13 Feb, 2009 al. sensation and perception).
- **Gender:** Both girl students and boy students were included in the study.
- **Locale:** Locale is the specific place where something happens. A locale identifies consists at least a language identifier and a region identifies. Here in this study both students from Rural and Urban areas were considered.
- **Medium of instruction:** The medium of Instruction is the language used by the teachers for teaching. Here medium of instruction is either Hindi or is English.

### **Research Design:**

- **Population :** The study required collection of information from Physics Students studying at Senior Secondary Stage in NIOS. Their Perception about different issues (e.g. objectives, course material, transaction methodology and evaluation pattern etc.) related to Physics curriculum prescribed in NIOS at Senior Secondary Stage was taken. Considering the above situations, the Physics Students of Uttar Pradesh (U.P.) who studying at Senior Secondary Stage in NIOS were defined as population of the study.
- **Sampling Technique and Sample :** For purpose of the present study, the sample has been taken from population of the study in two stages in the following way :
- **Selection of the Students :** For selecting sample from the population of Physics Students of Uttar Pradesh (U.P.) who studying at Senior Secondary Stage in NIOS, the purposive sampling technique was adopted. Twelve (12) districts of Eastern U.P. were selected



randomly. One hundred thirty two (132) Physics Students from these twelve districts were taken purposively in the sample. The developed tool was administered on them. At the final stage only 126 out of 132 Physics Students responded. The names of districts and number of Physics Students from those districts have been given below in table 1.:

**Table 1.: District-wise Distribution of Physics Students in the Sample**

Sl. No.	Name of the District	No. of Physics Students in the Sample	Actual Respondents
1.	Varanasi	14	11
2.	Gorakhpur	14	11
3.	Faizabad	14	11
4.	Ballia	10	10
5.	Allahabad	14	11
6.	Mau	10	10
7.	Azamgarh	14	11
8.	Basti	10	10
9.	Deoria	14	11
10.	Siddharthnagar	10	10
11.	Kushinagar	10	10
12.	Balrampur	10	10
		<b>N = 132</b>	<b>n = 126</b>

**Tools:**

- **Perception Scale for Physics Students of NIOS** has been constructed and standardized by the Researcher herself to critically evaluate the physics curriculum of NIOS at the Sr. Secondary stage for the Physics Students of Uttar Pradesh (U.P.) who studying at same standardized in NIOS.



**Statistical Analysis of the Data :**

- **Objective No. 1.** To study the Students’ Perception about the Personal Contact Programme ( PCP) of NIOS at the Sr. Secondary stage in Relation to their Personal Variables:
  - a. Medium of Instruction;
  - b. Area (Locality);
  - c. Gender (Sex);

Table – 2.: Showing the Mean (M) and Standard Deviation ( $\sigma$ ) of Students’ Perception Scores Falling in the Different Strata of their personal variables e.g. Medium of Instruction (A), Sex (B), Area (C), Socio-Economic Status (E)

Factors and its stages		Different stages of Factor B (ex)															
		B1 (Male)						B2 (Female)									$\Sigma$
		Different Stages of Factor C (Area)						Different Stages of Factor C (Area)									
		C1 (Urban Area)			C2 (Rural Area)			C1 (Urban Area)			C2 (Rural Area)						
		Different Stages of Factor D (Socio-Economic Status)			Different Stages of Factor D (Socio-Economic Status)			Different Stages of Factor D (Socio-Economic Status)			Different Stages of Factor D (Socio-Economic Status)						
		D1 High (SES)	D2 Middle (SES)	D3 Low (SES)	D1 High (SES)	D2 Middle (SES)	D3 Low (SES)	D1 High (SES)	D2 Middle (SES)	D3 Low (SES)	D1 High (SES)	D2 Middle (SES)	D3 Low (SES)				
1		2	3	4	5	6	7	8	9	10	11	12	13	14			
Different stages of factor A (Medium of Instruction)	A1 (English Medium)	N=5	N=8	N=4	N=4	N=8	N=3	N=6	N=9	N=4	N=4	N=6	N=2	N=6	3		
		$\Sigma M=61.20$	$\Sigma M=58.38$	$\Sigma M=46.25$	$\Sigma M=58.50$	$\Sigma M=57.50$	$\Sigma M=48.67$	$\Sigma M=64.83$	$\Sigma M=59.11$	$\Sigma M=43.00$	$\Sigma M=57.00$	$\Sigma M=60.17$	$\Sigma M=45.50$	$\Sigma M=56.68$			
		$\Sigma \sigma=8.349$	$\Sigma \sigma=9.410$	$\Sigma \sigma=6.850$	$\Sigma \sigma=12.503$	$\Sigma \sigma=7.746$	$\Sigma \sigma=6.028$	$\Sigma \sigma=6.646$	$\Sigma \sigma=4.729$	$\Sigma \sigma=6.683$	$\Sigma \sigma=14.514$	$\Sigma \sigma=6.242$	$\Sigma \sigma=3.536$	$\Sigma \sigma=9.563$			
	A2 (Hindi Medium)	N=5	N=8	N=4	N=4	N=8	N=3	N=6	N=9	N=4	N=4	N=6	N=2	N=6	3		
		$\Sigma M=34.80$	$\Sigma M=26.88$	$\Sigma M=23.75$	$\Sigma M=33.00$	$\Sigma M=30.63$	$\Sigma M=22.67$	$\Sigma M=34.17$	$\Sigma M=30.67$	$\Sigma M=21.00$	$\Sigma M=27.25$	$\Sigma M=29.17$	$\Sigma M=26.50$	$\Sigma M=29.06$			
		$\Sigma \sigma=7.085$	$\Sigma \sigma=8.026$	$\Sigma \sigma=6.994$	$\Sigma \sigma=9.764$	$\Sigma \sigma=6.948$	$\Sigma \sigma=10.17$	$\Sigma \sigma=2.787$	$\Sigma \sigma=3.969$	$\Sigma \sigma=7.616$	$\Sigma \sigma=8.057$	$\Sigma \sigma=3.656$	$\Sigma \sigma=.707$	$\Sigma \sigma=7.195$			



$\Sigma$		N=10	N=16	N=8	N=8	N=16	N=	N=12	N=8	N=8	N=8	N=12	N=4	N=126
		$\Sigma M=48.00$	$\Sigma M=42.63$	$\Sigma M=35.00$	$\Sigma M=45.75$	$\Sigma M=44.06$	$\Sigma M=35.67$	$\Sigma M=49.50$	$\Sigma M=44.89$	$\Sigma M=32.00$	$\Sigma M=42.12$	$\Sigma M=44.67$	$\Sigma M=36.00$	$\Sigma M=42.87$
		$\Sigma \sigma=15.713$	$\Sigma \sigma=18.330$	$\Sigma \sigma=13.628$	$\Sigma \sigma=17.136$	$\Sigma \sigma=15.593$	$\Sigma \sigma=16.046$	$\Sigma \sigma=16.736$	$\Sigma \sigma=15.235$	$\Sigma \sigma=13.501$	$\Sigma \sigma=19.261$	$\Sigma \sigma=16.908$	$\Sigma \sigma=11.165$	$\Sigma \sigma=16.225$

Table –IV : Summary Table of Four Way Four Way Analysis of Covariance (ANCOVA) of Chi-Square ( $\chi^2$ ) of ChiSquare ( $\chi^2$ ) (ANCOVA) of Chi-Square ( $\chi^2$ ) of Students' Perception Scores at Different Stages of Medium of Instruction (A), Sex (B), Area (C), Socio-Economic Status (E)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>b</sup>
Corrected Model	326833.915 <sup>a</sup>	26	12570.535	133.204	.000	.972	3463.291	1.000
Intercept	5.879	1	5.879	.062	.803	.001	.062	.057
<b>Students' Perception Scores</b>	13334.076	1	13334.076	141.294	.000	.588	141.294	1.000
I.Q	1421.932	1	1421.932	15.067	.000	.132	15.067	.970
Mental Health	4.373	1	4.373	.046	.830	.000	.046	.055
Medium of Instruction	154814.632	1	154814.632	1640.491	.000	.943	1640.491	1.000
Sex	52.996	1	52.996	.543	.455	.006	.562	.115
Area	95.978	1	95.978	1.017	.316	.010	1.017	.170
Socio-economic Status	12.494	2	6.247	.066	.936	.001	.132	.060



Medium of Instruction* Sex	116.665	1	116.665	1.236	.269	.012	1.236	.196
Medium of Instruction* Area	43.376	1	43.376	.460	.499	.005	.460	.103
Medium of Instruction* Socio-economic Status	158.851	2	79.425	.842	.434	.017	1.683	.191
Sex * Area	600.022	1	600.022	6.358	.013	.060	6.358	.704
Sex * Socio-economic Status	207.700	2	103.850	1.100	.337	.022	2.201	.238
Area * Socio-economic Status	291.277	2	145.638	1.543	.219	.030	3.087	.321
Medium of Instruction* Sex * Area	51.228	1	51.228	.543	.463	.005	.543	.113
Medium of Instruction* Sex * Socio-economic Status	426.409	2	213.204	2.259	.110	.044	4.518	.450
Medium of Instruction* Area * Socio-economic Status	37.292	2	18.646	.198	.821	.004	.395	.080
Sex * Area * Socio-economic Status	352.454	2	176.227	1.867	.160	.036	3.735	.381
Medium of Instruction* Sex * Area * Socio-economic Status	127.843	2	63.922	.677	.510	.013	1.355	.161
Error	9342.720	99	94.371					
Total	7797750.000	126						
Corrected Total	336176.635	125						

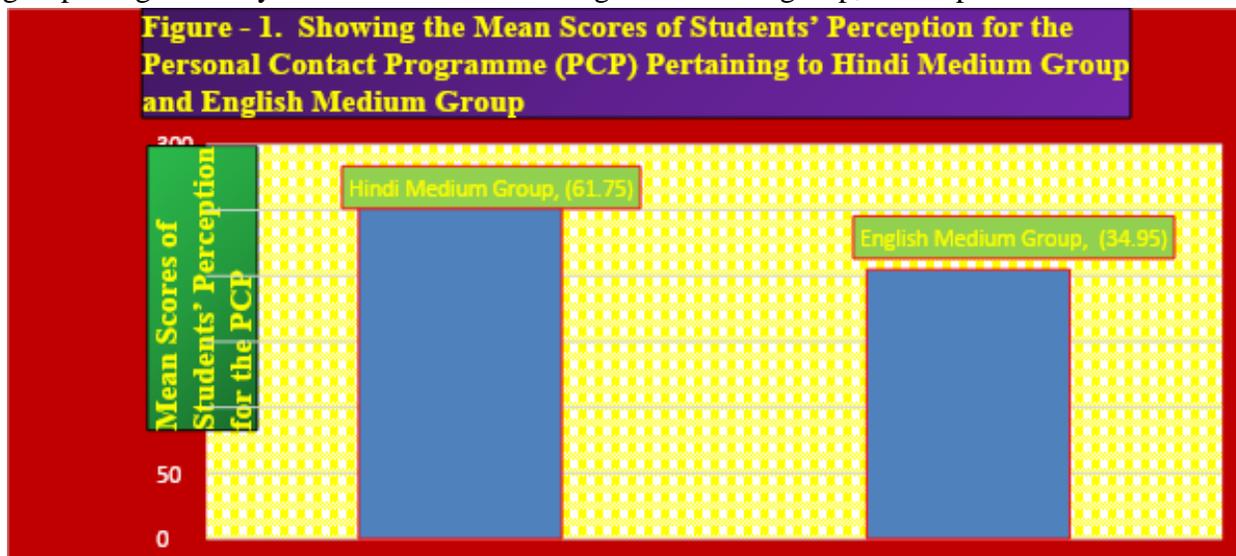
- R Squared = .972 (Adjusted R Squared = .965);**
- Computed using alpha = .05;**
- Table value of F-ratio is F.05= 3.94 and F.01= 6.90 for df = (1,99);**
- Table value of F-ratio is F.05 = 3.09, and F.01 = 4.82 for df = (2,99);**

The above **Table-3.** denotes that **Four Way Analysis of Covariance (ANCOVA) of Chi-Square ( $\chi^2$ ) of Chi-Square ( $\chi^2$ )** had been applied to the Students' Perception Scores for the Personal Contact Programme (PCP) at different stages of Medium of Instruction, sex, area, socio-economic status using Students' Perception Scores for the Personal Contact

Programme ( PCP) as within Subject variable/dependent variable; pre-test perception scores, intelligence scores, mental health scores as covariates; and the variables like – Medium of Instruction, sex, area, socio-economic status as independent variables. The Students’ Perception Scores for the Personal Contact Programme ( PCP) had been divided in the different groups in accordance with their Medium of Instruction, sex, area, socio-economic status. The results of the four way Four Way Analysis of Covariance (ANCOVA) of Chi-Square ( $\chi^2$ ) of Chi-Square ( $\chi^2$ ) shows that:

**H01.** The above Table-3. shows that the calculated value of **F (1, 99) = 1640.49 (P<.05)** for the main effect of Factor A (Medium of Instruction) far exceeds the critical value (**F.05 = 3.94**), therefore F- ratio is significant at **.05** level. As indicated by the eta squared value (**.943**) that the main effect of Medium of Instruction accounts for **94.3%** of the variance in total. Therefore null hypothesis is rejected and research hypothesis that is the mean scores of Students’ Perception for the Personal Contact Programme (PCP) pertaining to Hindi Medium group is significantly different from that of English Medium group, is accepted.

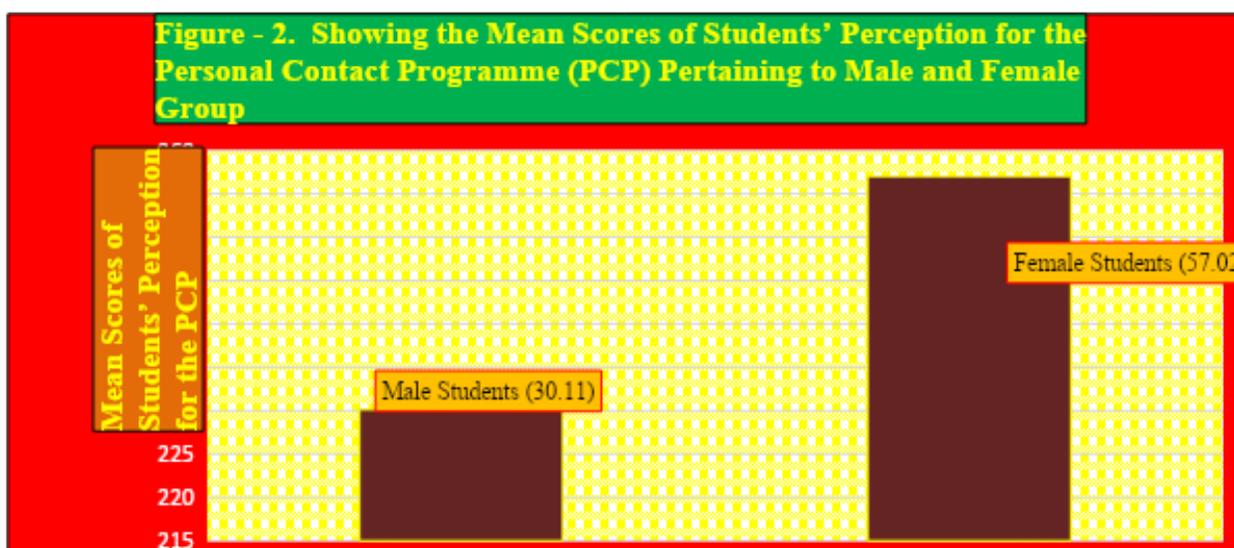
**Figure - 1. Showing the Mean Scores of Students’ Perception for the Personal Contact Programme (PCP) Pertaining to Hindi Medium Group and English Medium Group**



The above **Table-2. & 3.** and **Figure- 1.** shows that the mean scores of Students’ Perception for the Personal Contact Programme (PCP) pertaining to Hindi Medium group (**61.75**) is comparatively much higher than that of English Medium group (**34.95**) which shows that Medium of Instruction influences significantly to Students’ Perception for the Personal Contact Programme (PCP). The possible reasons may be that Medium of Instruction creates the environment conducive to nurture the appropriate knowledge, perception and Perception for the Assignment of Physics Course (APC) among the students through organizing proper curricular and co-curricular activities in the class room. The same thing **Meyer (1998)** revealed that organized curricular and co-curricular activities also provides structured time for

students to think, talk, and write about their experiences; fosters an ethic of caring for others; and encourages them to value diversity.

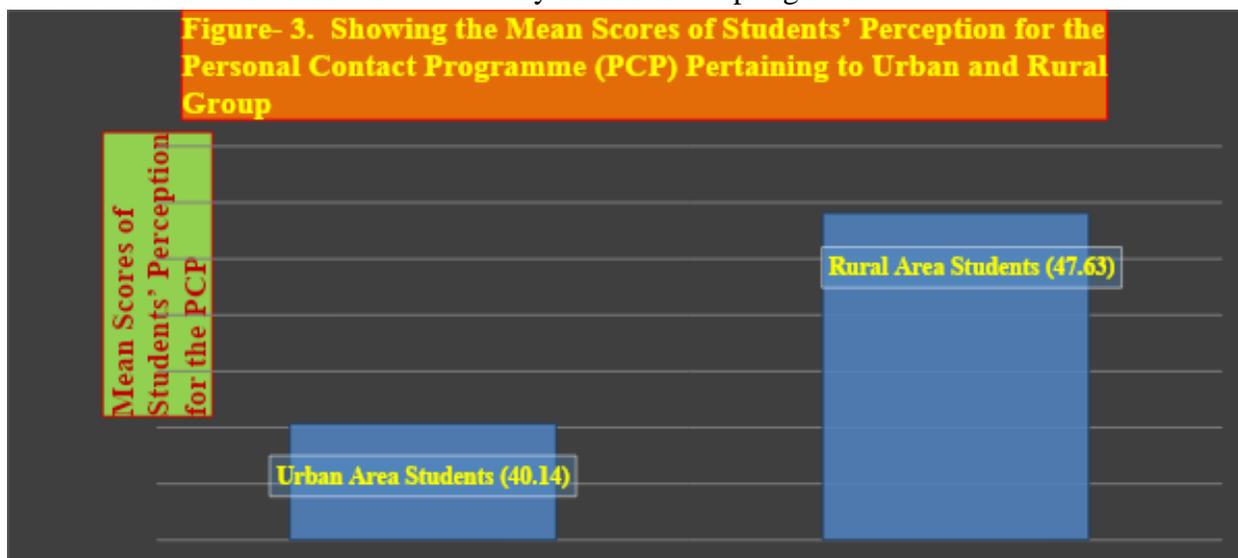
**H02.** The above Table- 3. shows that the calculated value of  $F(1, 99) = 0.543$  ( $P > .05$ ) for the main effect of Factor B (Sex) is very less than the critical value ( $F_{.05} = 3.94$ ), therefore F-ratio is not significant at **.05** level. As indicated by the eta squared value (**.006**) that the main effect of sex accounts for **0.6%** of the variance in total. Therefore null hypothesis that is the mean scores of students' Perception for the Personal Contact Programme (PCP) pertaining to male group is not significantly different from that of female group is accepted and the observed difference between them may be due to sampling error.



The above **Table-2.** and **Figure- 2.** shows that the mean scores of Students' Perception for the Personal Contact Programme (PCP) pertaining to male group (**30.11**) is comparatively less than that of female group (**57.02**) while at the same time, **Table-3.** makes it clear that there is no significant difference between the mean scores of students' Perception for the Personal Contact Programme (PCP) pertaining to male and female groups which shows that the Medium of Instruction almost equally influence to both the groups and sex differences hasn't any significant impact on Students' Perception for the Personal Contact Programme (PCP). The possible reasons may be that the girls are more humane and sensitive by nature in comparison to boys. They were comparatively more sincere in taking part in all the curricular and co-curricular activities that were organized in the class room. They had participated whole heartedly in them and fully enjoyed them. As some of the researches in the field like **Fung, Lee, & Chow (2007)** found that the students realize the importance of developing overall competences, by joining co-curricular activities and working collaboratively with their student peers on academic work in order to gain hands-on experience : perception of physical self, personal self, social self, identity, and self-satisfaction (**Finkenberg, 1990**).

Vulnerability to major depression is determined by how satisfied we are with our lives (Locke & Latham, 1990, 1990b; Kreitner & Kinicki, 2007). Agnihotri (2004) found no significant difference in male & female teacher trainees in terms of their environmental awareness and perception towards environmental approach.

**H03.** The above table-3 shows that the calculated value of  $F(1, 99) = 1.017 (P > .05)$  for the main effect of Factor C (Area) is very less than the critical value ( $F_{.05} = 3.94$ ), therefore F-ratio is not significant at .05 level. As indicated by the eta squared value (.010) that the main effect of area accounts for only 1.0% of the variance in total. Therefore the null hypothesis that is the mean scores of Students' Perception for the Personal Contact Programme (PCP) pertaining to urban group is not significantly different from that of rural group is accepted and the observed difference between them may be due to sampling error.



The above **Table-2.** and **Figure- 3.** shows that the mean scores of students' Perception for the Personal Contact Programme (PCP) pertaining to urban group (40.14) is comparatively less than that of rural group (47.63) while at the same time, **Table-3.** makes it clear that there is no significant difference between the mean scores of students' Perception for the Personal Contact Programme (PCP) pertaining to urban and rural groups which shows that Medium of Instruction almost equally influence to both the groups and area differences hasn't any significant impact on students' Perception for the Personal Contact Programme (PCP). The possible reasons may be that the adolescent belonging to both the localities – urban and rural are facing almost similar problems in their day to day life situations like- home violence, social violence, structural violence, social injustices, corruption, ill social practices, prejudices and partialities that are detrimental to their physical, mental, emotional and spiritual health. The researches in the field like **Banta & Kuh (1998)** found that the students who actively participated in curricular and co-curricular activities, became more receptive to ideas and more



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accepting of people from different backgrounds. They approached studies more seriously in subsequent years than they had in their first year : co-curricular activities were positively correlated to academic performance (**Hanks & Eckland, 1976; Camp, 1990**).

**Conclusion:** After analyzing the above results, the following conclusion may be drawn :

- Medium of Instruction differences more positively affects to the Hindi medium students' Perception about Personal Contact Programme (PCP) than that of their English medium counter parts.
- Medium of Instruction equally influence to both the urban & rural area Students' Perception about Personal Contact Programme (PCP) and area differences hasn't any significant impact on Senior Secondary School Students' Perception about Personal Contact Programme (PCP).
- Medium of Instruction equally influence to both the male & female Students' Perception about Personal Contact Programme (PCP) and sex differences hasn't any significant impact on Senior Secondary School Students' Perception about Personal Contact Programme (PCP).

**References :**

- D.K. Kar. (1986). A study of relationship between perception and achievement in general science of class IX students of Cuttack City Ph.D. Education..Utkal University, Cuttack.Unpublished Ph.D. Thesis.
- Digrumurti.(1996). Evaluation study of Andhra Pradesh 'X' class Biological Science TextBook.The Eduational Review, Vol.CII, No.10.
- Lachiver, G., & Tardif, J. (2002). Fostering and Managing Curriculum Change and Innovation. Proceedings - Frontiers in Education Conference, 2, F2F-7.<https://doi.org/10.1109/FIE.2002.1158168>
- N.B. Biswas. (1986). A study of the curriculum for primary education in Bangladesh. Ph.D. Edn. M.S.U University.Unpublished Ph.D. Thesis.
- NCERT(2005).National curriculum framework 2005. Retrieved from <http://epathshala.nic.in/programmes/national-curriculum-frameworks/>
- NCERT(2011). National study on ten year School curriculum. Retrieved from [http://ncert.nic.in/rightside/links/national\\_curriculum.pdf](http://ncert.nic.in/rightside/links/national_curriculum.pdf) 82
- Pandey, Dheeraj K. (2008). Vishwavidyalaya star par adhyayanrat samanya jati, anusoochit jati tatha janjati ke chhatra-chhatraon ke vibhinna jivan moolyaon ka tulnatmak adhyayan. Unpublished M. Ed. Dissertation, Department of Education, Tilak Degree College, Auraiya, U.P., India.
- Pandey, Dheeraj K. (2009). A study of the effects of internet uses on mental health, adjustment and stress of adolescents. Unpublished M. Phil. Dissertation, Department of Education, C.S.J.M. University, Kanpur, U. P., India.



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- Pandey, Dheeraj K. (2015). College teachers' life satisfaction in relation to their spiritual intelligence and job satisfaction. Unpublished PGDHE Project, School of Education, IGNOU, New Delhi, India.
  - Pandey, Priyanka (2022). Education for peace: Self-instructional package for teacher educators. Retrieved, June 12, 2022, from [www.uis.unesco.org/Education/Documents/fs30-teachers-en.pdf](http://www.uis.unesco.org/Education/Documents/fs30-teachers-en.pdf)
  - Prakash, Vidhya. (1991) "An investigation into curriculum policies, planning and their implementation at the primary school level in Delhi during 1966-76." Ph.D, Edu. Jamia Millia Islamia.
  - Ryder, J., & Banner, I. (2013). School Teachers' Experiences of Science Curriculum Reform. International Journal of Science Education, 35(3), 490–514. <https://doi.org/10.1080/09500693.2012.665195>
  - Singh, U.S. (1977). Development of a curriculum in science for secondary Schools in the State of Maharashtra, Ph.D. Edu., Bom. University.
  - TBSE (2016). Notice on new syllabus for class ix and x. Retrieved from [http://tbse.in/new/PDF/Notice\\_29\\_03\\_2016.pdf](http://tbse.in/new/PDF/Notice_29_03_2016.pdf).