

Students’ Perception about the Assignment of Physics Course (APC) of NIOS in Relation to their Personal Variables

**Mrs. Trisha Bhattacharya, Research Scholar,
Department of Education, Handia PG College, Affiliated to Veer Bahadur Singh
Purvanchal University, Jaunpur, U.P., India**

Abstract

Open learning system allow access to wider sections of adult populations, to enable students to complete lost opportunities in the past and it acquire new skills and qualifications. The open learning system is cost effective, flexible and innovative system. The learners have the freedom to take the examination as per their preparation. Hence in this paper the researcher examines in detail about the objective to study the students’ perception about the Assignment of Physics Course (APC) 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 and female students’ perception about Assignment of Physics Course (APC) than that of their English medium and male counter parts; (b.) Medium of instruction equally influence to both the urban & rural area students’ perception about APC and area differences hasn’t any significant impact on senior secondary school students’ perception about Assignment of Physics Course (APC).

Key Words : Perception, Assignment of Physics Course (APC), NIOS, Personal Variables, Virtual Education, Physics, Curriculum, Sr. Secondary Stage, Critical Analysis etc.

Introduction : With the rapid change in global society, education has been considered as a fundamental right among most of the countries of the today’s world. people have become aware about education. This, awareness has exerted. pressure on government to provide various opportunities to people. But the formal system of education National Institute of Open Schooling has made important alternatives of formal education. It provides education through distance and open learning mode at school level. It removes many barriers of needy learners. Open learning system is more flexible in term of admission process, study periods, duration of course, choice of subjects and other schedule. First time open school system at national level was came in 1979 through open School of CBSE. The first National Open school was set up in New Delhi in 1989 by department of education as an autonomous body. The government of India vested NOS with the authority to examine and certify learners registered with it up to pre degree level courses in 1990. It was reorganized as NIOS in July 2002.

National Institute of open schooling is working under the union government of India. It was established in 1989 by MHRD, Government of India to provide education in expensively in remote areas. Its previous name was National Open school. Its present name was changed in 2002. NIOS is a national board that conducts examinations for secondary and senior secondary schools of open learning. According to Mackenzie

and Scupham, open learning systems offer opportunities for part time study, learning at in distance and for innovations in the curriculum. Open learning systems intended to allow access to wider sections of adult populations, to enable students to complete lost opportunities in the past and it acquire new skills and qualifications. The open learning system is cost effective, flexible and innovative system.

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 Assignment of Physics Course (APC) of NIOS at the Sr. Secondary stage in Relation to their Personal Variables. Therefore, the following questions arose in the mind of the researcher:

1. Whether Students' Perception about the Assignment of Physics Course (APC) of NIOS at the Sr. Secondary stage is independent of their medium of instruction?
2. Whether Students' Perception about the Assignment of Physics Course (APC) of NIOS at the Sr. secondary stage is independent of their locality?
3. Whether Students' Perception about the Assignment of Physics Course (APC) of NIOS 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 Assignment of Physics Course (APC) 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 Assignment of Physics Course (APC) of NIOS at the Sr. secondary stage.

H0.2. There is no significant difference between the mean scores of urban and rural area students' perception about the Assignment of Physics Course (APC) 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 Assignment of Physics Course (APC) of NIOS at the Sr. secondary stage.

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

- **Evaluation-** Evaluation in education is the evaluation process of characterizing and appraising some aspect/s of an educational process. Educational institutions casually require evaluation data to demonstrate effectiveness to funders and other state holders, and to provide a measure of performance for marketing purposes. A curriculum evaluation is vital to understand the productivity of any curriculum offering and knowing when and what to update.
- **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.

- **Curriculum:-** Curriculum in Latin measure a course for racing". In education broadly deafened as arability of students experiences that occur development. In general education, it is set of courses, course work and content offered at a school or university. in the educational process (wiles, Jon (2008) Leading curriculum development). In general education, it is set of courses; course work and content offered at a school or university.
- **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
		N = 132	n = 126

□ **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 standard in NIOS.

Statistical Analysis of the Data :

- **Objective No. 1.** To study the Students' Perception about the Assignment of Physics Course (APC) of NIOS at the Sr. Secondary stage in Relation to their Personal Variables:
 - Medium of Instruction;
 - Area (Locality);
 - Gender (Sex);

Calculating the Mean (M) and Standard Deviation (σ) 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)

Factor s and its stages		Differ ent stages of Factor B Sex)												
		B1 (Male)					B2 (Fem ale)							Σ
		Differ ent Stages of Factor C (Area)					Differ ent Stage s of Facto r C (Area)							
		C1 (Urba n Area)			C2 (Rura l Area)		C1 (Urba n Area)			C2 (Rura l Area)				
		Differ ent Stages of Factor D			Differ ent Stage s of Facto r D		Differ ent Stage s of Facto r D			Differ ent Stage s of Facto r D				

		(Socio- Economic Status)			(Socio- Economic Status)			(Socio- Economic Status)			(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=6	N=2	N=63	
		$\sum M=61.20$	$\sum M=58.38$	$\sum M=46.25$	$\sum M=58.50$	$\sum M=57.50$	$\sum M=48.67$	$\sum M=64.83$	$\sum M=59.11$	$\sum M=43.00$	$\sum M=57.00$	$\sum M=60.17$	$\sum M=45.50$	$\sum M=56.68$
		$\sum \sigma=8.349$	$\sum \sigma=9.410$	$\sum \sigma=6.850$	$\sum \sigma=12.503$	$\sum \sigma=7.746$	$\sum \sigma=6.028$	$\sum \sigma=6.646$	$\sum \sigma=4.729$	$\sum \sigma=6.683$	$\sum \sigma=14.514$	$\sum \sigma=6.242$	$\sum \sigma=3.536$	$\sum \sigma=9.563$
	A2 (Hindi Medium)	N=5	N=8	N=4	N=4	N=8	N=3	N=6	N=9	N=4	N=6	N=2	N=63	
		$\sum M=34.80$	$\sum M=26.88$	$\sum M=23.75$	$\sum M=33.00$	$\sum M=30.63$	$\sum M=22.67$	$\sum M=34.17$	$\sum M=30.67$	$\sum M=21.00$	$\sum M=27.25$	$\sum M=29.17$	$\sum M=26.50$	$\sum M=29.06$
		$\sum \sigma=7.085$	$\sum \sigma=8.026$	$\sum \sigma=6.994$	$\sum \sigma=9.764$	$\sum \sigma=6.948$	$\sum \sigma=10.017$	$\sum \sigma=2.787$	$\sum \sigma=3.969$	$\sum \sigma=7.616$	$\sum \sigma=8.057$	$\sum \sigma=3.656$	$\sum \sigma=7.707$	$\sum \sigma=7.195$
Σ		N=10	N=16	N=8	N=8	N=16	N=6	N=12	N=18	N=8	N=12	N=4	N=126	
		$\sum M=48.00$	$\sum M=42.63$	$\sum M=35.00$	$\sum M=45.75$	$\sum M=44.06$	$\sum M=35.67$	$\sum M=49.50$	$\sum M=44.89$	$\sum M=32.00$	$\sum M=42.12$	$\sum M=44.67$	$\sum M=36.00$	$\sum M=42.87$
		$\sum \sigma=15.713$	$\sum \sigma=18.330$	$\sum \sigma=13.628$	$\sum \sigma=17.136$	$\sum \sigma=15.593$	$\sum \sigma=16.046$	$\sum \sigma=16.736$	$\sum \sigma=15.235$	$\sum \sigma=13.501$	$\sum \sigma=19.261$	$\sum \sigma=16.908$	$\sum \sigma=11.165$	$\sum \sigma=16.225$

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

Table –3. : Summary Table of Four Way Analysis of Covariance (ANCOVA) of Chi-Square (χ^2) of Students' Perception Scores for the Assignment of Physics Course (APC) at Different Stages of Medium of Instruction (A), Sex (B), Area (C), Socio-Economic Status (E)

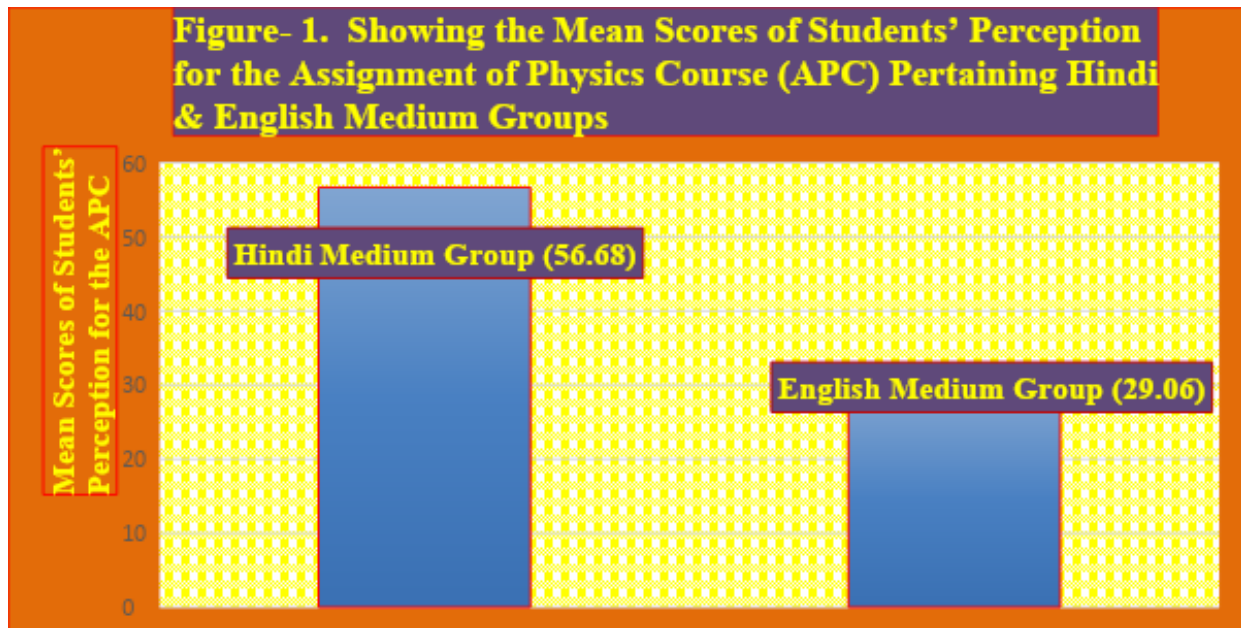
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Squared	Eta Noncent. Parameter	Observed Power ^b
Corrected Model	31980.597 ^a	26	1230.023	131.309	.000	.972	3414.036	1.000
Intercept	12.327	1	12.327	1.316	.254	.013	1.316	.206
Students' Perception Scores	355.249	1	355.249	37.924	.000	.277	37.924	1.000
I.Q	60.495	1	60.495	6.458	.013	.061	6.458	.711
Mental Health	25.908	1	25.908	2.766	.099	.027	2.766	.377
Medium of Instruction	19730.250	1	19730.250	2106.271	.05	.955	2106.271	1.000
Sex	70.164	1	70.164	7.490	.05	.070	7.490	.773
Area	14.958	1	14.958	1.597	.209	.016	1.597	.240
Socio-economic Status	20.074	2	10.037	1.071	.346	.021	2.143	.233
Medium of Instruction * Sex	1.417	1	1.417	.151	.698	.002	.151	.067
Medium of Instruction * Area	1.721	1	1.721	.184	.669	.002	.184	.071
Medium of Instruction * Socio-economic Status	27.195	2	13.598	1.452	.239	.028	2.903	.304

Sex * Area	5.613	1	5.613	.599	.441	.006	.599	.120
Sex * Socio-economic Status	7.467	2	3.733	.399	.672	.008	.797	.113
Area * Socio-economic Status	7.456	2	3.728	.398	.673	.008	.796	.113
Medium of Instruction * Sex * Area	2.350	1	2.350	.251	.618	.003	.251	.079
Medium of Instruction * Sex * Socio-economic Status	35.756	2	17.878	1.909	.154	.037	3.817	.388
Medium of Instruction * Area * Socio-economic Status	6.273	2	3.137	.335	.716	.007	.670	.102
Sex * Area * Socio-economic Status	57.280	2	28.640	3.057	.051	.058	6.115	.579
Medium of Instruction * Sex * Area * Socio-economic Status	33.948	2	16.974	1.812	.169	.035	3.624	.371
Error	927.371	99	9.367					
Total	264508.000	126						
Corrected Total	32907.968	125						

- R Squared = .972 (Adjusted R Squared = .964);
- 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 (χ^2)** had been applied to the Senior Secondary school students' Perception scores for the **Assignment of Physics Course (APC)** at different stages of Medium of Instruction, sex, area, socio-economic status using Senior Secondary school students' Perception scores as within subject variable/dependent variable; Senior Secondary school students' Perception scores for the Assignment of Physics Course (APC), intelligence scores, mental health scores as covariates; and the variables like – Medium of Instruction, sex, area, socio-economic status as independent variables. The Senior Secondary school students' Perception scores had been divided in the different groups in accordance to their Medium of Instruction, sex, area, socio-economic status. The results of the four way analysis of **Covariance (ANCOVA) of Chi-Square (χ^2)** show that:

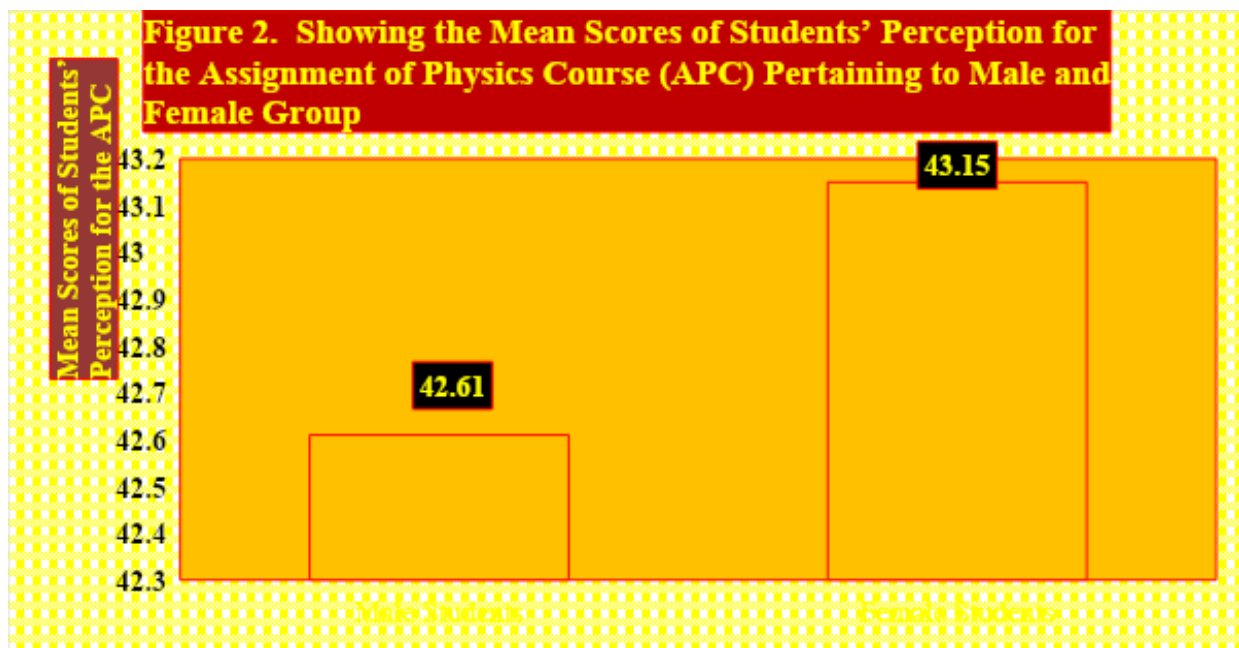
H01. The above table- 2. shows that the calculated value of $F(1, 99) = 2106.271$ ($P < .05$) for the main effect of Factor A (Medium of Instruction) far exceeds the critical value ($F_{.05} = 3.94$), therefore F- ratio is significant at .05 level. As indicated by the eta squared value (.955) that the main effect of Medium of Instruction accounts for 95.50% of the variance in total. Therefore null hypothesis is rejected and research hypothesis that is the mean scores of Senior Secondary school students' Perception scores for the Assignment of Physics Course (APC) pertaining to Hindi Medium group is significantly different from that of English Medium group, is accepted.



The above Table- 2. & 3. and Figure- 1. shows that the mean scores of Senior Secondary school students' Perception scores for the Assignment of Physics Course (APC) pertaining to Hindi Medium group (56.6794) is comparatively much higher than that of English Medium group (29.068254) which shows that Medium of Instruction affects significantly to the students' Perception for the Assignment of Physics Course (APC). The possible reasons may be that Medium of Instruction creates the environment conducive to nurture the appropriate value, understanding, perception, perception and skills for right perception 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- 2. shows that the calculated value of $F(1, 99) = 7.490$ ($P < .05$) for the main effect of Factor B (Sex) far exceeds the critical value ($F_{.05} = 3.94$), therefore F- ratio is significant at .05 level. As indicated by the eta squared value (.070) that the main effect of

Sex accounts for 7.0% of the variance in total. Therefore null hypothesis is rejected and research hypothesis that is the mean scores of Senior Secondary school students' Perception scores for the Assignment of Physics Course (APC) pertaining to male group is significantly

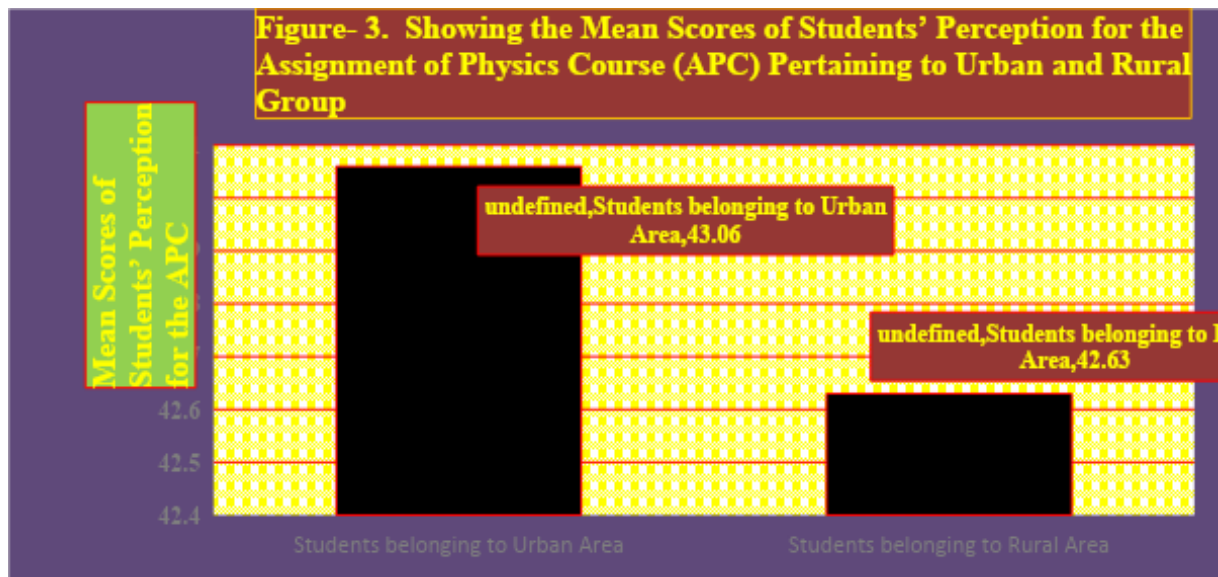


different from that of female group, is accepted.

The above Table- 2. & 3. and Figure-2 shows that the mean scores of Senior Secondary school students' Perception scores for the Assignment of Physics Course (APC) pertaining to male group (42.6112) is comparatively less than that of female group (43.15) which shows that Medium of Instruction affects more positively to the level of female students' perception about Assignment of Physics Course (APC) of NIOS in comparison to that of male students. 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 in them with whole heartedly and fully enjoyed them. As some of the researches in the field like **Fung, Lee, & Chow (2007)** found that 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 (**Finkenber, 1990**). Vulnerability to major depression is determined by how satisfied we are with our lives (**Locke & Latham, 1990, 1990b; Kreitner & Kinicki, 2007**).

H03. The above table- 3. shows that the calculated value of $F(1, 99) = 1.597$ ($P > .05$) 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 (**.016**) that the main effect of area accounts for only 1.6% of the variance in total. Therefore the null hypothesis that is the mean scores of Senior Secondary school students' Perception scores for the Assignment of Physics Course (APC) pertaining to urban area group is not significantly different from that of rural area group is accepted and the observed difference between them may be due to sampling error.



The above Table- 2. & 3. and Figure- 3. shows that the mean scores of Senior Secondary school students' Perception scores for the Assignment of Physics Course (APC) pertaining to urban group (43.0696) is comparatively a little higher or almost equal to that of rural group (42.6328) or in other words there is no significant difference between the mean scores of Senior Secondary school students' Perception scores for the Assignment of Physics Course (APC) pertaining to urban and rural area groups which shows that Medium of Instruction equally influence to both the groups and area differences hasn't any significant impact on Senior Secondary school students' right perception. The possible reasons may be that the students 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 students became more receptive to ideas and more accepting of people from different backgrounds. They approached studies more seriously in subsequent

years than they had in their first year : academic curriculum would enhance academic performance (Chambers & Schreiber, 2004). That directly benefit academic performance **(Black, 2002)**.

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 Assignment of Physics Course (APC) than that of their English medium counter parts.
- Medium of Instruction equally influence to both the urban & rural area Students' Perception about Assignment of Physics Course (APC) and area differences hasn't any significant impact on Senior Secondary School Students' Perception about Assignment of Physics Course (APC).
- Medium of Instruction affects more positively to the Female Students' Perception about Assignment of Physics Course (APC) in comparison to that of male students.
- Curricular reform is urgently needed in the existing curriculum of physics of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage.

References :

- A. R. Deshpande. (1992). An enquiry into the development of curriculum in mathematics at the secondary stage of education in Maharashtra State. Maharashtra.
- B.P. Darji. (1967). Curriculum Development in Secondary Schools. Baroda: A Report of All India.

- 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.
- L Tanner, D. T. (1975).Curriculum Development: Theory into Practice. New York: Macmillan.
- L. Brady. (1995). Curriculum Development (5th Edition). Sydney: Prentice-Hall.
- 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.
- National Council of Educational Research and Tranning (NCERT).(1988). National Curriculum for elementary and secondary education- a framework. NCERT, New Delhi.
- National Policy of Education(NPE). (1986, Rev. 1992).National Policy of Education.Ministry of Human Resource and Development, Department of Education, New Delhi.
- 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 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.
- 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
- 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.JamiaMilliaIslamia.
- 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>
- S. Maclure. (1971). Styles of Curriculum Development. USA: Allerton Park.
- Singh, U.S. (1977). Development of a curriculum in science for secondary Schools in the State of Maharashtra, Ph.D. Edu., Bom.University.