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## Subject Experts/ Counsellors' Perception about the Content of Physics Course (CPC) of NIOS in Relation to their Personal Variables

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*Open school learning system of education is an important mean to fulfill the need of all. It has created the 'facility to earn while you learn'. Education through open school learning system is a cost effective, flexible and innovative system. Hence in this paper the researcher examines in detail about the objective to study the Subject Experts/ Counsellors' perception about the content of physics course 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 subject experts/ counsellors teaching at senior secondary stage in NIOS as a sample and out of them 126 were responded. Further, he employed Perception Scale for Physics Subject Experts/ Counsellors 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 Subject Experts/ Counsellors' perception about content of physics course (CPC) than that of their English medium and male counter parts; (b.) Medium of instruction equally influence to both the urban & rural area Subject Experts/ Counsellors' perception about CPC and area differences hasn't any significant impact on senior secondary school Subject Experts/ Counsellors' perception about content of physics course (CPC).*

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

**Introduction** : The education imparted to four walls of classroom can now reach at the door step of learner through the open school learning system. Through this alternate system, everybody can achieve education according to his/her need. In open learning system, Subject Experts/ Counsellors may continue his/her work or job for income with education. It means, the open learning system of education has created the 'facility to earn while you learn'. Education through open school learning system is a cost effective, flexible and innovative system.



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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 Subject Experts/ Counsellors' academic success (Stephens & Schaben, 2002; Huang & Chang, 2004; Hunt, 2005), and contribute to bachelor's degree attainment (Tan & Pope, 2007). Subject Experts/ Counsellors 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 Subject Experts/ Counsellors 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 Subject Experts/ Counsellors from their regular study and degrade their academic performance. The researcher found the same case with the Subject Experts/ Counsellors' Perception about the Content of Physics Course 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 Subject Experts/ Counsellors' Perception about the Content of physics course of NIOS at the Sr. Secondary stage is independent of their medium of instruction?
- Whether Subject Experts/ Counsellors' Perception about the Content of Physics course of NIOS at the Sr. secondary stage is independent of their locality?



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- Whether Subject Experts/ Counsellors' Perception about the Content of physics course 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 Subject Experts/ Counsellors' Perception about the Content of Physics Course 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 Subject Experts/ Counsellors' perception about the content of physics course of NIOS at the Sr. secondary stage.

H0.2. There is no significant difference between the mean scores of urban and rural area Subject Experts/ Counsellors' perception about the content of physics course of NIOS at the Sr. secondary stage.

H0.3. There is no significant difference between the mean scores of male and female Subject Experts/ Counsellors' perception about the content of physics course 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.

**•Curriculum:-** Curriculum in Latin measure a course for racing". In education broadly defined as a variety of Subject Experts/ Counsellors 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.

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•**Sr. Secondary Stage:** Sr. Secondary stage means Class XII, Which takes place after secondary; education, followed by higher education. Research was limited to Subject Experts/ Counsellors 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 Subject Experts/ Counsellors and boy Subject Experts/ Counsellors 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 Subject Experts/ Counsellors 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 Subject Experts/ Counsellors teaching 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 Subject Experts/ Counsellors of Uttar Pradesh (U.P.) who were teaching 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 Subject Experts/ Counsellors :** For selecting sample from the population of Physics Subject Experts/ Counsellors of Uttar Pradesh (U.P.) who were teaching 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 Subject Experts/

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Counsellors 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 Subject Experts/ Counsellors responded. The names of districts and number of Physics Subject Experts/ Counsellors from those districts have been given below in table 1.:

**Table 1.: District-wise Distribution of Physics Subject Experts/ Counsellors in the Sample**

Sl. No.	Name of the District	No. of Physics Subject Experts/ Counsellors 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>



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**•Tools:**

**•Perception Scale for Physics Subject Experts/ Counsellors 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 Subject Experts/ Counsellors of Uttar Pradesh (U.P.) who were teaching at same standard in NIOS.

**Statistical Analysis of the Data :**

**•Objective No. 1.** To study the Subject Experts/ Counsellors' Perception about the Content of Physics Course 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 Subject Experts/ Counsellors' 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 (Sex)												
		B <sub>1</sub> (Male)						B <sub>2</sub> (Female)						□
		Different Stages of Factor C (Area)						Different Stages of Factor C (Area)						
		C <sub>1</sub> (Urban Area)			C <sub>2</sub> (Rural Area)			C <sub>1</sub> (Urban Area)			C <sub>2</sub> (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)			
		D <sub>1</sub> H igh (SES)	D <sub>2</sub> Mi ddle (SES)	D <sub>3</sub> Lo w (SES)	D <sub>1</sub> Hig h (SES)	D <sub>2</sub> Mi ddle (SES)	D <sub>3</sub> Lo w (SES)	D <sub>1</sub> Hi gh (SES)	D <sub>2</sub> Mi ddle (SES)	D <sub>3</sub> Lo w (SES)	D <sub>1</sub> Hig h (SES)	D <sub>2</sub> Mi ddle (SES)	D <sub>3</sub> Lo w (SES)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Different stages of factor A (Medium of Instruction)	A <sub>1</sub> (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=63
	□M=	□M=	□M=	□M=	□M=									
	61.20	58.38	46.25	58.50	57.50	48.67	54.83	59.11	43.00	57.00	60.17	45.50	56.68	
	□σ=	□σ=	□σ=	□σ=	□σ=									
	8.349	9.410	6.850	12.503	7.746	6.028	6.646	4.729	6.683	14.514	6.242	3.536	9.563	
	A <sub>2</sub> (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=63
□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	
34.80	26.88	23.75	33.00	30.63	22.67	34.17	30.67	21.00	27.25	29.17	26.50	29.06		
□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	
7.085	8.026	6.994	9.764	6.948	10.017	2.787	3.969	7.616	8.057	3.656	.707	7.195		



	N=10	N=16	N=8	N=8	N=16	N=6	N=12	N=18	N=8	N=8	N=12	N=4	N=126
□	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=	□M=
	48.00	42.63	35.00	45.75	44.06	35.67	49.50	44.89	32.00	42.12	44.67	36.00	42.87
	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=	□σ=
	15.71	18.33	13.628	17.136	15.593	16.046	16.736	15.235	13.50	19.261	16.908	11.16	16.225
	3	0							1			5	

**Table –3. : Summary Table of Four Way Four way analysis of Covariance (ANCOVA) of Chi-Square ( $\chi^2$ ) of Subject Experts/ Counsellors’ Perception Scores for the Content of Physics Course (CPC) 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	31980.597 <sup>a</sup>	26	1230.023	131.309	.000	.972	3414.036	1.000
Intercept	12.327	1	12.327	1.316	.254	.013	1.316	.206
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



<b>Medium of Instruction* Sex * Area * Socio-economic Status</b>	33.948	2	16.974	1.812	.169	.035	3.624	.371
<b>Error</b>	927.371	99	9.367					
<b>Total</b>	264508.000	126						
<b>Corrected Total</b>	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) had been applied to the Senior Secondary School Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC) at different stages of Medium of Instruction, sex, area, socio-economic status using Senior Secondary School Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC) as within subject variable/dependent variable; 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 Senior Secondary School Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC) 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) show that:



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**H<sub>01</sub>**. The above table- 3. 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 Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC) 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 Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC) pertaining to Hindi Medium group (56.6850794) is comparatively much higher than that of English Medium group (29.068254) which shows that Medium of Instruction affects significantly to the Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC). The possible reasons may be that Medium of Instruction creates the environment conducive to strengthen the appropriate value, understanding, perception and skills for living with togetherness among the Counsellors through organizing proper professional developmental activities in time to time.

**H<sub>02</sub>**. The above table- 3. 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 Subject Experts/ Counsellors'



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Perception Scores for the Content of Physics Course (CPC) 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 Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC) pertaining to male group (39.12) is comparatively less than that of female group (40.23) which shows that Medium of Instruction affects more positively to the level of female Subject Experts/ Counsellors' Perception for the Content of Physics Course (CPC) in comparison to that of male Counsellors. The possible reasons may be that the females are more humane and sensitive by nature in comparison to that of males. They were comparatively more sincere in taking part in all the professional development activities that were organized in time to time. 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 Counsellors realize the importance of developing overall competences, by joining professional development activities and working collaboratively with their students and 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 Subject Experts/ Counsellors' Perception Scores for



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the Content of Physics Course (CPC) 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 Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC) pertaining to urban group (38.28) is comparatively a little higher or almost equal to that of rural group (37.96) or in other words there is no significant difference between the mean scores of Senior Secondary School Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC) pertaining to urban and rural area groups which shows that Medium of Instruction equally influence to both the groups and sex differences hadn't any significant impact on Senior Secondary School Subject Experts/ Counsellors' Perception Scores for the Content of Physics Course (CPC). The possible reasons may be that the Counsellors 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 Counsellors 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**).



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

- Medium of Instruction differences more positively affects to the Hindi medium Subject Experts/ Counsellors' Perception about Content of Physics Course (CPC) than that of their English medium counter parts.
- Medium of Instruction equally influence to both the urban & rural area Subject Experts/ Counsellors' Perception about CPC and area differences hasn't any significant impact on Senior Secondary School Subject Experts/ Counsellors' Perception about Content of Physics Course (CPC).
- Medium of Instruction affects more positively to the Female Subject Experts/ Counsellors' Perception about Content of Physics Course (CPC) in comparison to that of male Subject Experts/ Counsellors.
- Proper representation has been given to physics curriculum of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage.
- The existing curriculum of physics curriculum of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage was very dull and overloaded.
- Educational climate of physics classrooms of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage was very stressful and boring.
- The existing physics curriculum of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage was unable in making the students to utilize its theoretical knowledge in their practical life.
- The objectives of the physics curriculum of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage were appropriate and adequate.



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- The content of physics curriculum of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage wasn't appropriate, sufficient, understandable and comprehensive. It was very dull and overloaded and it was unable in grasping the interest of students.
  - Overall, the physics curriculum of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage was impracticable and it wasn't easy to run.
  - Curricular reform was urgently needed in the existing curriculum of physics of National Institute of Open Schooling (NIOS) at the Sr. Secondary stage.

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