LEARNING ACHIEVEMENT OF CLASS-VIII STUDENTS IN SCIENCE IN RELATION TO LOCALITY OF SCHOOL, GENDER AND SOCIAL CATEGORY

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ABSTRACT

Learning Achievement in science is influenced by locality of school, social category and gender .National Achievement Survey (NAS)-2017 reported that, overall achievement of students in science in Class VIII in Odisha is trailing behind the National average .The said survey observed that Students from groups, comprising Scheduled Castes, Scheduled Tribes and General categories score significantly lower in science than students under the Socially & Economically Backward Category. Although there is no significant difference between the achievement of boys and girls in science, rural students perform better as compared to Urban students in science at National level .However ,in Odisha, performance of rural Class VIII students in science is also better as compared to their Urban counterparts and boys perform better in science as compared to girls. Also students from SC,ST and General categories score significantly lower in science than students under the SEBC category .To address this research gap ,a study was conducted on 505 Class VIII students ,selected randomly. A self made achievement test in science was prepared and administered on the students spreading over 12 schools of 6 blocks and 3 districts of Odisha state. Three-way ANOVA was used to analyse the data to study the influence of locality of schools, gender and social category of students of Class VIII along with interaction effect on learning achievement in science. A regression analysis was done to determine the contribution of the predictor variables like locality of schools, gender and social category to the criterion variable like learning achievement in science. It is found that locality of schools influences learning achievement in science significantly along with social category. The data reveal that (i) rural students perform better than their urban counterparts .(ii)General students demonstrate better learning achievement with a mean score of 31.82 as compared with SEBC,SC and ST students with mean scores of

learning achievements 30.12,18.09 and 11.87 respectively. Further it is found from the regression analysis that locality of schools and social category contributes significantly to learning achievement in science .

Keywords -Learning Achievement in science, Locality of school, Gender ,Social Category and Upper Primary Level.

INTRODUCTION

Scientific knowledge enables us to develop new technologies, address practical problems, and make informed judgments. New scientific information leads to new applications, therefore the scientific process is closely linked with applications to advance knowledge and society . The scientific knowledge also serves to meet many basic human needs and enhance living standards, that is why the study of science is given priority at school and tertiary level. The science education which follows scientific method includes observation, testing and data collection, produces scientific knowledge and logical analysis. Scientific knowledge is long lasting and more or less stable ,but it is subject to correction or refinement. Learning science inside and outside classroom helps students to apply science in day-to-day life.

REVIEW OF RELATED LITERATURE

LEARNING ACHIEVEMENT OF STUDENTS IN SCIENCE

Fischer (2013), while studying on learning achievement of students in science at upper primary level, found that interactions among environmental factors, peer group relationships, and learning opportunities students had both in and out of school, as well as physical, psychological, cognitive, social, and emotional processes influencing one another and shaping children's development and learning scientific concepts.

Mahmud et al. (2018), while conducting a study on the impact of assessment on learning achievement of upper primary level students in science, reported that science teachers need to be equipped with knowledge, understanding, and practices high-level thinking skills, such as,

developing high-level questions in their assessments, establishing rubrics in assessing student activities, and enhancing better achievement of students in science.

LEARNING ACHIEVEMENT OF STUDENTS IN SCIENCE WITH RESPECT TO LOCALITY OF SCHOOLS

Nasri et al. (2010), Alabdulkareem (2016) conducted a study to identify impact of locality of school (Rural /Urban) on learning achievement of students in science at upper primary level and found that limited science materials and resources acts as a barrier to rural children receiving equal access to high-quality science education. Students in Rural schools are unable to correlate science with their day today activities.

Kalonde (2017) ,Agbo & Isa (2017)reported that Science teaching in Rural schools falls short of the national level. This is illustrated by the scarcity of technology as well as the fact that Rural school teachers have only a minimum understanding of current technology.

However ,The National Achievement Survey (NAS-2017) reported that Rural Class VIII students perform significantly better in science . Performance of State-Odisha by Locality of School in Class V: EVS and in Class VIII: Science has been shown in Table No.-1.

Table No.-1

Performance of State-Odisha by Locality of Schoolin Class V: EVS and in Class VIII: Science

Odisha	Rural mean score	Urban mean score
Class VIII: Science	279	269
Class V: EVS	312	306

Also in Odisha state it is found that rural students perform better as compared to Urban students in science .

LEARNING ACHIEVEMENT OF STUDENTS IN SCIENCE WITH RESPECT TO GENDER OF STUDENTS

Hannum and Buchmann (2005),Hadjar and Berger (2011),Veloo et al. (2013), while conducting research on (boys/girls) learning achievement status in science at upper primary level ,found that, in many countries, girls showed better achievement in science as compared with their boys counterparts at upper primary level.

Hadjar et al. (2012), Klapproth et al.(2013) ,Dublin et al. (2014), while conducting research on comparing gender of students with learning achievement of students in science at upper primary level , found that there is no gender differences in learning achievement in science at upper primary level.

Blossfeld et al. (2009) and Hadjar (2011) Bhagavatheeswaran et al.(2016) while conducting a research on learning achievement of boys and girls in science at upper primary level ,found that boys performed better in science as compared with their girl counterparts at upper primary level .

According to National Achievement Survey (NAS-2017), boys performed significantly better than Girls in Class VIII in Science. Performance of State - Odisha by Gender in Class V: EVS and in Class VIII: Science has been shown in Table no.-2

Table No.-2

Performance of State-Odisha by Gender in Class V: EVS and in Class VIII: Science

Odisha	Boys mean score	Girls mean score
Class VIII: Science	279	276
Class V: EVS	311	312

Thus, the question of gender has not been conclusively addressed in the scholastic literature.

LEARNING ACHIEVEMENT OF STUDENTS IN SCIENCE WITH RESPECT TO SOCIAL CATEGORY OF STUDENTS

Dyer (2011) while conducting a study on learning achievement of different social category of students at upper primary level, focused on inclusion and participation of children from SC/ST and other disadvantaged groups in learning science .This included special provisions and budget allocation for the disadvantaged sections, curricular support and training of teachers in science to attend to the needs of these children.

From the report of National Achievement Survey NAS (2012) it can be seen that, students from Scheduled Castes, Scheduled Tribes, and Other Backward Categories scored significantly lower in science than students in the General category.

Bhagavatheeswaran et al.(2016) while conducting study on learning achievement in science of different social category students at upper primary level, found that SC/ST girls in Northern Karnataka suffered a lot from learning science as compared to their boys counterparts .

National Achievement Survey (NAS-2017) reported that Students of Class VIII , comprising Scheduled Castes, Scheduled Tribes and General categories score significantly lower in science than students under the Socially & Economically Backward Category.

SEBC students of Odisha state perform better by Social Groups in Class VIII in science and in Class V in EVS as reported by National Achievement Survey (NAS-2017) which has been shown in Table no.-3

Table No.-3

Performance of Odisha by Social Groups in Class V :EVS and in Class VIII: science as reported by NAS-2017.

State	Class	Subject	SC mean score	ST mean score	OBC mean score	General mean score	Sig.
Odisha	Class VIII	Science	275	266	285	283	ST < SC < Gen <OBC
	Class V	EVS	312	302	320	316	ST < SC < Gen <OBC

The survey clearly indicates gap in the learning achievement existing among students having different social category.

RATIONALE OF THE STUDY

Learning achievement of students in science leads to development in cognitive affective and psychomotor domains (Fischer (2013)).Overall achievement of students in Class VIII in Odisha is trailing behind the National average (National Achievement Survey (NAS)-2017) science teachers need to be equipped with knowledge, understanding, and practice of high-level thinking skills(Mahmud et al. (2018)) .Learning achievement of Rural schools falls due to unavailability of adequate facilities. Students in Rural schools are unable to correlate science with their day today activities.(Nasri et al. (2010), Alabdulkareem (2016)) . Rural school teachers have a minimum understanding of current technology(Kalonde (2017) ,Agbo & Isa (2017)). Rural Class VIII students perform significantly better in science (According to National Achievement Survey ((NAS-2017)) . Girls show better achievement in science as compared with their boys counterparts at upper primary level (Hannum and Buchmann (2005) Hadjar and Berger (2011) Veloo et al. (2013)) .There were no gender differences in learning achievement in science at upper primary level (Hadjar et al. (2012) , Klapproth et al.(2013)). Boys perform better in science as compared with their girl counterparts at upper primary level (Blossfeld et al. (2009) and Hadjar (2011) Bhagavatheeswaran et al.(2016), National Achievement Survey (NAS-2017)). Focused on inclusion and participation of children from SC/ST and other disadvantaged groups in learning science(Dyer (2011)). Students comprising Scheduled Castes, Scheduled Tribes and Other Backward Categories, scored significantly lower in science than students in the General category (National Achievement Survey (NAS - 2012)). Students comprising General ,SC and ST scored significantly lower in science than students in the SEBC category.SC/ST girls in Northern Karnataka suffered a lot from learning science as compared to their boys counterparts (Bhagavatheeswaran et al.(2016)) .

In view of the research gaps as observed from the review of Related Literature, it is considered worthwhile to conduct a research study on the problem

"LEARNING ACHIEVEMENT CLASS –VII AND CLASS –VIII IN SCIENCE IN RELATION TO LOCALITY OF SCHOOL, GENDER AND SOCIAL CATEGORY AT UPPER PRIMARY LEVEL."

OBJECTIVES

1.To study the influence of the locality of schools ,gender and social category of students in learning achievement of class VIII students in science.

2. To study the individual contribution of gender, locality of schools & social category in predicting learning achievement of class VIII students in science.

HYPOTHESIS

Ho.1- There exists no significant influence of gender, locality of school, social category & their interaction on learning achievement of class VIII students in science .

Ho.2- There exists no significant individual contribution of gender, locality of school & social category in predicting learning achievement of class VIII students in science.

DELIMITATION OF THE STUDY

The present study was conducted on 12 Elementary Schools having Class- VIII of Odisha state covering Kendrapara, Dhenkanal & Ganjam districts . 02 blocks from each district & 02 schools from each block that is 04 schools from each district were considered for the purpose of study.

RESEARCH METHODOLOGY

Descriptive survey method was used to collect data for this study.The researcher obtained data from students in Class VIII by using a self developed Achievement Test. The Independent

Variables of the study are Location of schools, Gender and Social Category of students reading in Class VIII and the Dependent Variable is Learning Achievement of students in science.

PARTICIPANTS

Data were obtained from 505 Class VIII students from 12schools of 6 blocks covering 3 districts of Odisha. Gender wise, Locality wise, Qualification wise number of **participants** have been furnished in the Table No-4.

TABLE No.-4

Gender wise, Locality wise and Qualification wise number of participants.

Social Category	Urban Class –VIII		Rural Class –VIII		Total Class –VIII students
	Boys	Girls	Boys	Girls	
General	37	25	36	29	127
SEBC/OBC	69	48	59	75	251
SC	28	18	12	17	75
ST	18	11	11	12	52
Total	152	102	118	133	505

An Achievement test having 50 numbers of questions was prepared for Class –VIII. Before preparing the questions the researcher has framed a blue print. For class VIII the researcher has taken five chapters related to Physics ,Chemistry, Biology and Ecology. The questions were framed under three domains of learning that is knowledge, understanding, application/skill . Total marks assigned for the achievement test was 50 . Each question carries 01 mark .Time allotted to answer the questions was 01hour .From each selected chapter certain conceptual questions were framed . For each question four options were provided .Students were supposed to give answer as per given instruction . The number of questions framed from Physics, Chemistry, Botany, Zoology and Ecology may be seen from the following Table-05.

Table-05

Number of questions framed from different branches of science for class VIII students in the administered achievement test

Branches of science	Number of questions framed
Physics	12
Chemistry	11
Botany	11
Zoology	10
Ecology	06
Total no. of questions	50

COLLECTION OF DATA

The Learning Achievement test in science was conducted to find out the achievement level of class VIII students in science with respect to Gender ,Location of school & Social Category. Students were explained how the test items are to be filled up before the test.

ANALYSIS OF DATA

Three –way ANOVA was used to find out the effects of gender, locality of schools and social category on learning achievement for class VIII students. Regression analysis was done to study the individual contribution of gender, locality of schools & social category in predicting learning achievement of class VIII students in science.

LEARNING ACHIEVEMENT OF CLASS -VIII STUDENTS IN SCIENCE WITH RESPECT TO SOCIAL CATEGORY, GENDER AND LOCALITY

In order to study the effect of Social Category, Gender and Locality on Learning achievement of class-VIII students in science, students were classified under four levels of Social Categories (General, SEBC, SC, ST), two levels of Gender (Boys and Girls) and two levels of Locality (Rural and Urban).

Three - way Analysis of Variance was applied to find out the main effect and interaction effects of Social Category, Gender and Locality on Learning achievement of class-VIII students .The 2x2x4 factorial design has been followed as described in Figure-1

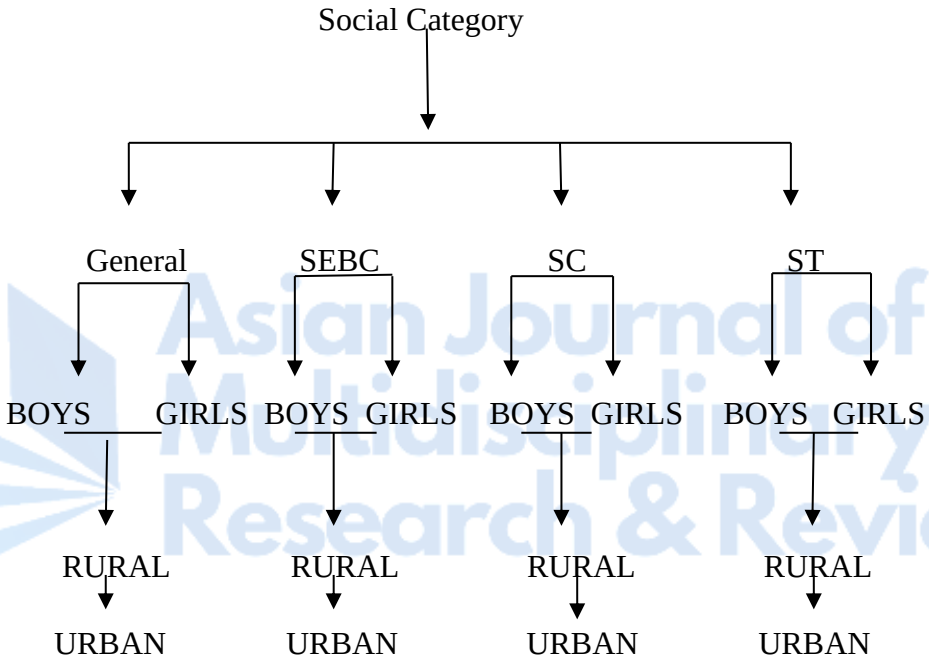

Figure-1. 2x2x4 factorial design to study the effect of Social Category, Gender and Locality on Learning achievement .

The achievement test in Science for Class VIII was administered for students based on their course . The achievement scores were categorized under Social Categories (General, SEBC, SC, ST), Gender (Boys and Girls) and Locality (Rural and Urban).The data relating to mean achievement score and S.D. have been presented in Table-6 for Class VIII students .

Mean learning achievement scores of Class VIII students in science across Social category, Gender of students and Locality of schools have been shown in Table-5

TABLE-6

The distribution of N ,Means and SDs of learning achievement scores across Locality of schools ,Social category and Gender of Class VIII students in science (N=505)

Social Category		General		SEBC		SC		ST	
Gender		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Urban	N	37	25	69	48	28	18	18	11
	M	27.92	32.68	28.35	29.04	18.68	17.22	10.72	12.55
	SD	9.73	9.99	10.30	7.48	9.25	6.25	4.74	6.47
Rural	N	36	29	59	75	12	17	11	12
	M	34.69	32.48	32.25	30.75	19.42	17.12	12.00	12.83
	SD	6.53	10.05	5.55	8.63	9.28	8.28	8.33	9.05

Category wise Mcomb (Combined mean) of class-VIII students with respect to their Learning Achievement in science has been shown in Table-7.

TABLE-7

Mcomb (Combined mean) scores on Learning Achievement in science of class-VIII students with respect to Social category, Gender and Locality of school.

Variables	Social category				Gender		Locality of school	
Categories	General	SEBC	SC	ST	Boys	Girls	Rural	Urban
	31.82	30.12	18.09	11.87	26.74	27.03	28.72	25.05

Three-Way ANOVA was applied to find out the influence of Locality , Gender and Social Category on Learning Achievement of class-VIII students on total scores. The result of ANOVA have been shown in TABLE-8 .

TABLE-8

Summary of Three-Way ANOVA showing the effect of Locality , Gender and Social Category on Learning Achievement of class-VIII students on total scores.

Dependent Variable: Learning Achievement						
Source of variance	Sum of Squares	Df	Mean Square	F	P-value	Level of Significance.
Locality (A)	276.410	1	276.410	3.897*	0.049	P<0.05
Gender(B)	0.541	1	0.541	0.008	0.930	P>0.05
Social Category(C)	21970.832	3	7323.611	103.266**	0.000	P<0.01
Locality x Gender (A x B)	161.741	1	161.741	2.281	0.132	P>0.05
Locality x Social Category (A x C)	141.373	3	47.124	0.664	0.574	P>0.05
Gender x Social Category (B x C)	142.778	3	47.593	0.671	0.570	P>0.05
Locality x Gender x Social Category (A x B x C)	164.027	3	54.676	0.771	0.511	P>0.05
Error	34679.924	489	70.920			
Total	59481.632	504				
a. R Squared = .417 (Adjusted R Squared = .399)						

****Significant at 0.01 level of significance**

***Significant at 0.05 level of significance**

MAIN EFFECT

(i)Locality (A):-Influence of locality of schools on learning achievement of students.

From the Table-8, it can be seen that the F-value of 3.897 for locality of school is significant at 0.01 level with df = 1/489.It indicates that the mean scores of learning achievement of rural & urban students differ significantly .So there is a significant influence of locality on learning achievement of students. Thus the Ho that there exists no significant influence of locality of schools on learning achievement of class VIII students in science is rejected. Further the mean score of learning achievement of Urban student is 25.05 which is significantly lower than that of Rural students whose mean score of learning achievement is 28.72.It may, therefore, be concluded that Rural students are found to have higher learning achievement as compared to Urban students.

(ii) Gender (B):-Influence of Gender on learning achievement of students

From the Table -8 ,it can be seen that the F value of 0.008 for Gender of students of class-VIII is not significant .It indicates that the mean scores of learning achievement of boys & girls of class-VIII did not differ significantly. So there was no significant influence of Gender on learning achievement of students of class-VIII is found. Thus, the Ho that there is no significant influence of Gender on learning achievement of students of class-VIII is not rejected. It may ,therefore, be said that both boys & girls students of class-VIII were found to have learning achievement to the same extent.

(iii) Social Category (C) :- Influence of Social Category on learning achievement of students

From the Table-8, it can be seen that the F-value of 103.266 for Social Category of students is significant at 0.01 level with df = 3/489.It indicates that the mean scores of learning achievement of General, SEBC, SC & ST students differ significantly .So there was a significant influence of Social Category on learning achievement of students. Thus the Ho that there exists no significant influence of Social Category on learning achievement of class VIII students in science is rejected. Further the mean score of learning achievement of General students is 31.82 which is significantly higher than that of SEBC,SC and ST students whose mean scores of learning achievements 30.12,18.09 and 11.87 respectively. It may, therefore,

be concluded that General students are found to have higher learning achievement as compared to. SEBC,SC and ST students .

INTERACTION EFFECT

Learning Achievement is found to be independent of interaction between Locality of schools & Gender, Locality of schools & social category and Gender & Social Category as well as among Locality of schools **,** Gender & Social Category.

Contribution of variables like Locality of schools, Gender & Social Category in determining learning achievement of class-VIII students in science.

Regression analysis for determining the contribution of variables like Locality of schools, Gender & Social Category in determining learning achievement of class-VIII students in science has been shown in Table-9.

TABLE- 9

Model summery of Regression equation(Class-VIII)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.595[a]	.354	.350	8.761
a. Predictors: (Constant), Social Category, Gender, Locality of schools				

ANOVA for regression equation determining the contribution of variables like Locality of schools, Gender & Social Category in determining learning achievement of class-VIII students in science has been shown in Table-10

TABLE-10

ANOVA for regression equation(Class-VIII)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	37.161	1.865		19.922	.000
	Locality of schools	2.791	.788	.129	3.540	.000
	Gender	.076	.788	.004	.097	.923
	Social Category	-6.929	.437	-.571	-15.866	.000
a. Dependent Variable: Learning Achievement						

Regression analysis was done for class VIII students with "Learning Achievement" as the criterion variable and Locality of schools, Gender & Social Category of students as the predictor variables, the results of which are presented in the Table - 9 . As may be seen from the Table - 9 ,the multiple correlation coefficient is 0.595 for class -VIII students .The respective squared multiple correlation coefficient is 0.354.

The three predictor variables taken together accounted for 35% of variation in learning achievement of class -VIII students. As it may be seen from the Table-10, among the three predictor variables the beta coefficients associated with the 'Social Category' was the highest for class -VIII students that is -.571.Among the three predictor variables, 'Social Category' carried the highest predictive power in explaining variations in learning achievement .For class -VIII students , 'Gender' was in-consequential in explaining learning achievement variations ,while 'Locality of schools' remained as a significantly contributing variable .

In summary, it can be said that students differed with respect to their learning achievement primarily because of their 'Social Category' status and partially ,yet significantly, because of their 'Locality of schools'. The findings suggest that greater educational attention needs to be paid to bridge variations in academic achievement arising out of student's 'Social Category' status in order to achieve equity in science Education.

MAIN FINDINGS

(i) Rural Class-VIII students are found to have higher learning achievement in Science as compared with Urban students.

(ii) Both boys & girls students of class-VIII were found to have learning achievement to the same extent.

(iii) Learning Achievement in science of Class-VIII General students are found to have higher as compared to SEBC,SC and ST students .

(iv) Learning Achievement in science of Class-VIII students is found to be independent of interaction between Gender & Social Category, Locality of schools & social category and Locality of schools & Gender.

(v) Students differed with respect to their learning achievement primarily because of their 'Social Category' status and partially ,yet significantly, because of their 'Locality of schools'.

DISCUSSION

The findings of the study relating to locality is in agreement with report provided by National Achievement Survey (NAS-2017). The findings of the study relating to gender is in agreement with studies reported by Hadjar et al. (2012), Klapproth et al.(2013) and Dublin et al. (2014).The findings of the study relating to social category contradicts report provided by National Achievement Survey (NAS-2017) with respect to general & SEBC categories ,however it is in agreement with the report provided by National Achievement Survey (NAS-2012) with respect to general & SEBC categories and studies reported by Bhagavatheeswaran et al.(2016) and Dyer (2011) with respect to SC & ST categories .

EDUCATIONAL IMPLICATION

(i) The network of monitoring and supervision may be strengthened in Urban areas.

(ii) Science experts may extend onsite academic support to science teachers in Urban areas .

(iii) Greater educational attention needs to be paid to bridge variations in academic achievement arising out of student's 'Social Category' status .

(iv) SEBC,SC and ST students may be provided with remedial teaching to improve their level of learning in science which is very essential from the priority view of equality.

(v) Since SC,ST mean achievement score in science is very poor, they may be provided with supplementary materials in science along with laboratory support.

(vi) There is need for capacity building of teachers to improve the teaching learning needs of SC,ST students.

(vii) However overall performance of students in science achievement is good which can be further improved.

REFERENCE

1. Alabdulkareem, S. A. (2016). The Impact of Science Teachers' Beliefs on Teaching Science: The Case of Saudi Science Teachers. Journal of Education and Learning, 5, 233-249. https://doi.org/10.5539/jel.v5n2p233
2. Agbo, F. O., & Isa, A. A. M. (2017). Scientific Skills and Concept Learning by Rural Women for Personal and National Development. Science Education International, 28, 128-135.
3. Banilower, E.R., Smith, P.S., Weiss, I.R., Malzahn, K.A., Campbell, K.M., and Weis, A.M. (2013). *Report of the 2012 National Survey of Science and Mathematics Education*. Chapel Hill, NC: Horizon Research.
4. Blossfeld, H., W. Bos, B. Hannover, D. Lenzen, D. Müller-Böling, M. Prenzel, and L. Wössmann, eds. 2009. *Geschlechterdifferenzen Im Bildungssystem. Jahresgutachten 2009* [Gender Differences in Educational Systems]. Wiesbaden: VS Verlag. [Google Scholar]
5. Bhagavatheeswaran, Lalitha et al., (2016). The barriers and enablers to education among scheduled caste and scheduled tribe adolescent girls in northern Karnataka, South India: A qualitative study, International Journal of Educational Development. 49: pp. 262-270.

6. Dyer, Caroline (2010) 'Education and social (in)justice for mobile groups: re-framing rights and educational inclusion for Indian pastoralist children', Educational Review, 62: 3, 301 — 313

7. Dublin, R., Sigman, M., Anderson, A., Barnhardt, R., & Topkok, S. A. (2014). COSEE-AK Ocean Science Fairs: A Science Fair Model That Grounds Student Projects in Both Western Science and Traditional Native Knowledge. Journal of Geoscience Education, 62, 166-176. https://doi.org/10.5408/12-411.1
8. Fischer, K. W., & Bidell, T. R. (2006). Dynamic development of action, thought, and emotion. In W. Damon & R.M. Learner (Eds.), Theoretical models of human development, Handbook of child psychology (6th ed., Vol. 1, pp. 319–399). New York: Wiley. [Google Scholar]
9. Goldhaber, D., Lavery, L., and Theobald, R. (2015). Uneven playing field? Assessing the quality gap between advantaged and disadvantaged students. *Educational Researcher*, *44*(5), 293-307.
10. Holubova, R. (2008). Effective Teaching Methods—Project-Based Learning in Physics. Online Submission, 5, 27-36. https://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf
11. Hascher, T., and G. Hagenauer. 2010. "Alienation from School." *International Journal of Educational Research* 49: 220–232. doi:10.1016/j.ijer.2011.03.002. [Crossref], [Google Scholar]
12. Hadjar, A., and J. Lupatsch. 2011. "Geschlechterunterschiede Im Schulerfolg. Spielt Die Lehrperson Eine Rolle? [Gender Differences in Educational Success. Does the Teacher Matter?]." *Zeitschrift Für Soziologie Der Erziehung Und Sozialisation* 31: 79–94. [Web of Science ®], [Google Scholar]
13. Hannum, E., and C. Buchmann. 2005. "Global Educational Expansion and Socio-economic Development: An Assessment of Findings from the Social Sciences." *World Development* 33: 333–354. [Crossref], [Web of Science ®], [Google Scholar]
14. Hadjar, A., E. Grünewald-Huber, S. Gysin, J. Lupatsch, and D. Braun. 2012. "Traditionelle Geschlechterrollen Und Der Geringere Schulerfolg Der Jungen. Quantitative Und Qualitative Befunde Aus Einer Schulstudie Im Kanton Bern

(Schweiz) [Traditional Gender Roles and the Lower Educational Attainment of Boys. Quantitative and Qualitative Findings from a School Study in the Kanton Bern (Switzerland)].” *Schweizerische Zeitschrift Für Soziologie* 38: 375–400. [Google Scholar]

15. Kalonde, G. (2017). Rural School Math and Science Teachers' Technology Integration Familiarization. International Journal of Educational Technology, 4, 17-25.
16. Klapproth, F., S. Krolak-Schwerdt, S. Glock, R. Martin, and M. Böhmer. 2013. “Prädiktoren Der Sekundarschulempfehlung in Luxemburg: Ergebnisse Einer Large-Scale-Untersuchung [Predictors of the Luxembourgish Secondary School Recommendations: Findings from a Large Scale Study].” *Zeitschrift Für Erziehungswissenschaft* 16: 335–379. doi:10.1007/s11218-012-9197-z. [Crossref], [Web of Science ®], [Google Scholar]
17. Mahmud, S. N. D., Nasri, N. M., Samsudin, M. A., & Halim, L. (2018). Science Teacher Education in Malaysia: Challenges and Way Forward. Asia-Pacific Science Education, 4, 8. https://doi.org/10.1186/s41029-018-0026-3
18. Nasri, N. M., Yusof, Z. M., & Halim, L. (2010). Uncovering Problems Faced by Science Teacher. Procedia—Social and Behavioral Sciences, 9, 670-673. https://doi.org/10.1016/j.sbspro.2010.12.215
19. Rockoff, J. E., & Lockwood, B. B. (2010). Stuck in the middle: Impacts of grade configuration in public schools. Journal of Public Economics, *94*(11–12), 1051–1061. [Crossref], [Web of Science ®], [Google Scholar]
20. National Achievement Survey-2012. NASGOI. RTE: The Gazette of India. (2012).
21. National Achievement Survey-2017. NASGOI. RTE: The Gazette of India. (2017). Retrived from: http://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/RTE_Amendment_2017.pdf
22. Veloo, A., Perumal, S., & Vikneswary, R. (2013). Inquiry-Based Instruction, Students' Attitudes, and Teachers' Support towards Science Achievement in Rural Primary Schools. Procedia—Social and Behavioral Sciences, 93, 65-69. https://doi.org/10.1016/j.sbspro.2013.09.153