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CONTENTS

Editorial

Educational scenario has assumed unprecedented dynamism in the light of the fast growing technological advancements coupled with the changes in information and dissemination facilities. This has also led to changes in research and innovations being conducted by the scholars for different stages of education. Schools are the basic structure where education shapes the destiny of a learner, who gains experiences and expertise through interaction with the educational environment. For this interaction to be meaningful, the school environment has to be conducive to effective teaching – learning, responding to child's individual capacities and aspirations. While the policies focus on the child as a learner, the scholars are constantly researching on making the learning experience rich and relevant. We bring some of these efforts to you through our latest issue of Indian Educational Review, which contains six research papers.

The first paper assesses the influence of out of school experiences on interest in science and relevance of these experiences in science education and factors influencing out of school experiences, interest in science and their interrelation. This Kerala experience could be of use for rural and distant schools with limited facilities for experimental science. Language is an important factor in teaching – learning process and the issue of the language to be used remains debatable. To address one of the aspects of this issue i.e., how language can even become a barrier in imparting education, the researcher of the second paper has studied effects of school language – home language gap on primary education, the study focusing on the first generation learners of disadvantaged groups. The next paper on assistive technology for students with visual impairment aims at critically reviewing the benefits and limitation of using such technologies for education of such people. The fourth paper discusses the emotional intelligence in relation to occupational self-efficacy and personality of secondary school teacher. The fifth paper examines the impact of learning approaches on achievement of pupil teachers in relation to their academic streams at different levels of intelligences. The last paper reflects on the gender differences in self-concept among adolescent students of Uttarakhand. The paper studies secondary school students in public schools and government schools both in rural and urban settings and compares development of self-concept.

This issue also contains summaries of three research projects funded by NCERT under ERIC. These are:

1. A Theory of Mind Based Programme for Enhancement of Children's Social Skills.
2. Education for the Challenged Children: Trends and Innovation in East Khasi Hills District of Meghalaya.
3. Development of Training Package in School Mathematics (DTPSM) for Pre-service and In-service Teachers.

The Indian Educational Review focuses on enriching the discipline of education by disseminating findings of educational research, providing opportunities for exhanging research experience among fellow researchers, motivating young researchers and providing inputs to all those involved in policy making and planning. Contributions of academicians, researchers, research writers and institutions are cordially invited for the next issue. We welcome your suggestions for improvement in the quality of the journal.

Poonam Agrawal
Academic Editor

Indian Educational Review

Indian Educational Review aims to enhance the theory and practice of research in education. It is a journal of opinion and research in the field of education. Contributions may comprise scholarly discussion of new issues, reports of research, reviews of researches in particular field, reports of developments, and debate on educational research generally or on specific issues. Contributions are also invited reporting all kinds of empirical research in education, whether sociological, psychological, economic or organisational. The journal is intended to cover a wide range, including interdisciplinary studies.

In addition, the purpose of this journal is to provide a medium for dissemination of educational research and exchange of experiences among research workers, scholars, teacher educators, teachers and others interested in educational research and related fields and professions.

Indian Educational Review is published half-yearly, in January and July by the National Council of Educational Research and Training (NCERT), New Delhi. The journal is indexed in *Indian Psychological Abstracts and Reviews, Sociological Abstracts and Contents Pages in Education (U.K.).*

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Research Papers

Influence of Out-of-School Experiences on Interest in Science of Secondary School Students in Kerala

Dr K. Abdul Gafoor* and Smt. Jaithra, V.S.**

Abstract

Influence of out-of-school experiences on interest in science and such experiences which are significantly contributive to interest are studied on a representative sample of grades 8-9 students of Kozhikode district. Locale but not gender difference exists in extent of interest. Over 40 per cent variance in science interest is attributable to out-of-school experiences. Observation and visits influence interest in science above collection and activity. Influence of common place life experiences among rural students and of structured, organised and planned experiences among urban students were evidenced. Among rural students influence from physical science related experiences is stronger. In urban sample, influence of visits and collections is more and that of activity mainly of physical sciences is less. Experimental experiences were found inconsequential on student interest. Implications for science curricula, instruction, textbooks and support facilities, teacher preparation, assessment and research are added.

Introduction

India and the world need scientists in adequate number, a population and workforce able to think scientifically, and, a citizenry able to understand and approach science and technology related questions with positive attitudes. There is an increase in the number of students in higher education, and in science and technology too. But, the proportion of science and technology students to the total students

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has been decreasing during the last two decades (Organisation for Economic Co-operation and Development [OECD], 2006). In India too, students' interest in science was found to decline as they climb educational ladder from middle school classes to tertiary level. Students are not pursuing science because they have no interest in science (Shukla, 2005). Guiding force that determines the choices that one formulates is one's own interests. So students' interest in science should enhance. Lack of interest in science is due to lack of confidence in science, stemming from insecurity in understanding science. Science teaching is less intrinsically motivating. While nearly two–thirds of students in Classes VI to VIII are satisfied with the quality of science teaching, this falls to just 40 per cent in senior secondary classes (Shukla, 2005). In other countries too, science curriculum is overloaded with content unrelated to life (Osborne and Collins, 2001).

One way to develop interest in science is to relate science topics with students' experiences. Learning based on experiences generates interest. Connections between students' lives and what they learn in their science courses increase student interest in science (Hulleman and Harackiewicz, 2009). Learning becomes fruitful when past experiences of learner interact meaningfully with present ones. The idea that past experiences of individual interacts with present situation to form new experiences (Dewey, 1938) is old enough. Experiences lead to further inquiry, enjoyment and a sense of what is being leant as personally relevant. If materials presented are familiar, students develop a desire for further learning. Thus, experiences have major role in developing interest.

Relevance of Out-of-School Experience in Science Education

Formal and informal experiences of students may affect interest in science. Children are naturally curious to learn about the things they experience. If these experiences satisfy them, they get interested. Out-of-school visits, collections, making models, watching science-programmes, voluntary work, and the like give students relief from classroom routine, and make the learning interesting and fruitful. Experiences, thought and actions are interrelated. Watching, listening and doing are the ways to spark interest. Strengthening the exposure to science through hands-on activities will result in a more positive perception of these subjects among teens (Lemelson-MIT Invention Index, 2010). Hands-on school science programmes help to increase the number of students entering and maintaining science

careers (Roberts and Wassersug, 2009) also. Since every experience that has gone before influences the quality of further learning, out-of-school experiences have evident long-term effects, too.

Many psychologists and educationists (Dewey, 1925; Lewin, 1936; Piaget, 1951; Kolb, 1984; Melnick, 1991; Wilson, 2005) have established a strong and inseparable link between informal experiential basis and the development of children. The formal external influences are just acting upon this experiential foundation to enhance learning. These experiences can be direct, indirect or vicarious (Kellert, 2005). Out-of-school experiences require social participation that offers students with social support, whereas, school-based experiences do not (Melnick, 1991). Allowing social interaction creates real interest in the topic and a desire to learn, besides the cognitive gains (Koosimile, 2004; Jarman, 2005). In contrast, alienation of school science from the society results in its decontextualisation (Ebenzer and Zoller, 1993).

Out-of-school experiences are effectively used in science lessons to develop interest in science. Science educators, therefore, have begun to pay greater attention to the potential interactions between formal and informal science learning. Though some teachers make extensive use of student-experiences in science lessons; majority of teachers use real-life contexts barely for classroom activities. One reason behind this is that the use of students' out-of-school experiences in science education has not been systematically studied (Cajas, 1998).

Factors Influencing Out-of-School Experience, Science Interest and their Interrelation

Many factors interplay the influence of science related experience on the development of interest in science among students. So, teachers need to promote a congruent relationship between out-of-school science experiences and formal science learning (Mayoh and Knutton, 1997; Lindemann and Matthies, 2006). Age affects experiential foundation (Bottomley and Omerod, 1981; Coley et al., 2005) and there exist gender differences in science related activities (Gardner, 1975; Bottomley and Omerod, 1981; Hadden and Johnstone, 1982; Farenga and Joyce, 1997). Studies suggest that there are urban-rural differences in experiential basis (Coley et al., 2005; Gafoor and Smitha, 2010) and that these differences have differing impacts on learning (Brown, 2007).

For interest in science too, social variables such as ethnic origin (Taylor, 1993) and parental education (Miller, 1988) are important. Kahle (2004) who reported more interest for boys (13+ age group) and Singh (1999) who reported more interests for girls (18+ age group) have reached almost opposing conclusions on gender difference in interest. Gender difference in science interest (Feldhusen and Williard-Holt, 1993) is due more to gender role socialisation (Jones and Kirk, 1990) and is more qualitative than quantitative (Qualter, 1993; Dawson, 2000; Tsabari and Yarden, 2005; Trumper, 2006). Greenfield (1997) further observed a reversal of interest patterns of boys and girls as they move from primary to secondary school. Significant correlation exists between science interest and science experiences (Johnson, 1987 and Uitto et al., 2006; Zoldosova and Prokop, 2006).

In Kerala context, upper primary girls showed more interest in science than boys though out-of-school science experiences were more for boys than girls (Gafoor and Smitha, 2010). Surveys also revealed that more urban pupils than rural pupils preferred science for higher education. Vani (1997) reported urban-rural difference in student interest in science. Interest in science is found to be decreasing with increase in age (Shukla, 2005) and according to this study urban student than rural student tend to prefer scientific jobs.

Significance of this Study

It is accepted that teachers can bring changes in students' interest (Kelly, 1988; Cooper and McIntyre, 1996) and for this out-of-school experiences are effective doorways. Linking science with students' out-of-school experiences require further studies on new world of children (Cajas, 1998). Contextualising science instruction involves utilising children's prior knowledge and everyday experience as a catalyst to understand the challenging concepts in science (Osborne and Collins, 2001; Rivet and Krajcik, 2008). Carefully planned and designed out-of-school experiential programmes have the potential to broaden students experiences of science and are helpful to bridge the gap between the school science with student experience (Luehmann, 2009). Those who engage in more hands-on activities achieve high (Stohr.Hunt and Patricia, 1996) too.

Students, of course, have innumerable likings and preferences. Student interests are fairly settled dispositions which teachers have to notice, to pay attention to, and to engage in some appropriate activity with certain sorts of things rather than others - as evidenced

from time to time by student inclinations. In order for teachers to efficiently incorporate out-of-school experiences in their plan for teaching and thus to enhance students interest and achievement in science, it will be highly helpful if experiences that are the most significant in developing student interest are identified.

Objective of the Study

This study looks at the influence of out-of-school experiences on interest in science in terms of predictive efficiency and thus, tries to pinpoint such experiences which are significantly contributive to the interest in science among secondary school students. Further, it examines whether interest in science among secondary school students significantly differ based on their gender and locale of their school, and if so, to locate such experiences which are significantly contributive to the interest in science among the subsamples based on gender and locale, too.

Method

Sample

Sample used is 1000 students drawn from 8th and 9th grades of 14 secondary schools belonging to government, aided, unaided categories in Kozhikode revenue district of Kerala by means of proportionate stratified random sampling. There were 714 rural and 286 urban school students, and 501 boys and 499 girls.

Measures

Scale of Interest in Science

One hundred topics in the secondary school science curriculum covering three fields i.e., Physics, Chemistry and Biology were finalised after analysing the contents in the science textbooks of standards 8-12 of schools following Kerala state curriculum. Pilot run of draft items and conventional item analysis procedure for ensuring discrimination power were done. For each topic, students indicated extend of interest on a 3-point likert scale, sum of which indicated the total score. Test re-test reliability coefficient is 0.97 (N=40).

Scale of Out-of-school Science Experiences

A total of 160 direct, indirect or vicarious experiences related with three main branches of school science viz., Physics, Chemistry and Biology that the children have from their surroundings and

which they choose to have without any external compulsion are put under five categories viz., observation, visits, collection, activity and experimentation. The experiences included were decided after informal interviews, pilot run of draft items, and conventional item analysis procedure for ensuring discrimination power among children of the pertinent age. For each item, students indicated extend of experience on a 3-point likert scale. Test re-test coefficient of correlation of the total scale was 0.96 (N=40).

Results

Influence of Out-of-School Science Experiences on Interest in Science

Distributions of interest in science scores (M= 122.54, median=124, mode=118, SD=37.41, skewness=-.30, kurtosis= -.17) and out-of-school science experience (total) scores (M= 172.18, median=171, mode=164, SD= 45.67, skewness=0, kurtosis=0.23) are near normal. Multiple regression analysis was conducted to examine the influence of out-of school science experience on interest in science of secondary school students (Table 1).

Table 1

Results of Multiple Regression Analysis for Interest in Science of Secondary School Students in the Total Sample

Predictors	R	R^2x100	F	B	t	SE	β	r	βxr
Photos of astronauts[3]	0.35	12.1	25.44*	6.86	3.78	1.82	0.130	0.338	0.439
Parasitic animals[1]	0.44	19.7		6.78	4.31	1.57	0.137	0.330	0.0452
Darkening of Silver Ornaments[1]	0.49	24.9		5.65	3.45	1.64	0.110	0.286	0.0315
Primary health centre[2]	0.53	27.9		4.99	3.27	1.53	0.105	0.285	0.299
NPK Fertilizers[1]	0.55	30.3		5.00	2.97	1.68	0.098	0.297	0.0291
Photos of Scientists[3]	0.56	31.8		4.67	2.43	1.92	0.086	0.331	0.0285
Making Electric current from tomato[5]	0.58	33.2		5.58	3.95	1.41	0.120	0.157	0.0188
Plant-growth[1]	0.59	34.2		4.94	2.74	1.80	0.084	0.230	0.0193
Loosening of electric line during summer[1]	0.59	35.0		3.69	2.32	1.59	0.074	0.277	0.0205

Making thick Jaggery[4]	0.59	35.7		4.4.5	3.07	1.45	0.095	0.209	0.0199
Soap Factory[2]	0.60	36.3		3.73	2.47	1.51	0.078	0.102	0.0079
Battery cells[3]	0.61	37.0		4.37	2.83	1.54	0.090	0.231	0.0208
Mammals[1]	0.61	37.5		4.01	2.49	1.61	0.080	0.241	0.0192
Aquaculture (Fish) farm[2]	0.62	38.0		4.03	2.72	1.48	0.087	0.113	0.0098
Pictures of the living[3]	0.62	38.5		4.72	2.26	2.09	0.073	0.278	0.0203
Ferns[1]	0.62	39.0		3.79	2.64	1.44	0.083	0.091	0.0076
Thorny Plants[1]	0.63	39.5		3.71	2.17	1.71	0.068	0.230	0.0156
Difficulty in closing doors during rainy season[1]	0.63	39.9		3.84	2.17	1.77	0.067	0.244	0.0163
Science books[3]	0.63	40.2		3.36	2.06	1.63	0.068	0.266	0.0181

Note: p<.01 (19,718) df
#1,2,3,4 and 5 indicates experiences categorised under observation, visit, collection, activity and experimentation respectively.

In the total sample, 19 out-of-school science experiences together significantly predict 40.2 per cent variance of interest in science [R = 0.63, F = 25.44 for (19,718 df), p<.01]. In order to understand the extent of influence of each significant out-of-school experience on interest, for each experience βr x 100, percentage influence of experience on interest (efficiency of the predictor), were estimated. These 19 significant predictor experiences in the order of their percentage influence (in parentheses) on interest in science are: Observation of parasitic animals (4.52), Collection of photos of astronauts (4.39), Observation of darkening of silver ornaments (3.15), Visit to primary health centre (2.99), Observation of NPK fertilisers (2.91), Collection of photos of scientists (2.85), Collection of battery cells (2.08), Observation of loosening of electric lines during summer (2.05), Collection of pictures of the living (2.03), Making thick jaggery (1.99), Observation of plant growth (1.93), Observation of mammals (1.92), Making electric current from tomato (1.88), Collection of science books (1.81), Observation of difficulty in closing doors during rainy season (1.63), Observation of thorny

plants (1.56), Visit to aquaculture (fish) farm (0.98), Visit to soap factory (0.79), and Observation of ferns (0.76).

Influence of Out-of-School Science Experiences on Interest in Science in the Subsamples

Mean difference analysis was done to examine the difference in interest in science between boy-girl and urban-rural sub samples (Table 2).

Table 2

Result of Test of Significance of Difference between the Mean Scores of Interest in Science of Subsamples Based on Gender and Locale

Subsamples based on	Groups	N	Mean	SD	Critical ratio
Gender	Boys	501	122.13	38.22	0.35
	Girls	499	122.96	36.60	
Locale	Rural	714	125.39	38.17	3.84**
	Urban	286	115.41	34.46	

*Note: **p<.01*

There exists no significant difference between boys and girls in the extent of interest in science (p>.05), but there exists significant difference between the rural and urban school students in the extent of interest in science (p<.01). Hence, experiences which are significantly contributive to the interest in science among rural and urban samples are identified separately, while no such analysis was done on boy-girl subsamples.

In the rural sample

Result of multiple regression analysis to examine the influence of out-of-school experience on interest in science among rural secondary school students is in Table 3.

Table 3

Results of Step-wise Multiple Regression Analysis for Interest in Science of Secondary School Students in the Rural Sample

Predictors	R	R^2x100	F	B	t	SE	b	r	βxr
Parasitic animals[1]	0.36	12.8	23.62*	8.83	4.82	1.83	0.176	0.247	0.0435
Photos of scientists[3]	0.48	22.6		7.98	3.68	2.17	0.141	0.275	0.0388

Darkening of silver ornaments[1]	0.53	27.7		8.93	4.71	1.89	0.168	0.204	0.0343
Primary health centre[2]	0.57	32.0		7.23	4.24	1.70	0.147	0.202	0.0297
Making electric current from tomato[5]	0.59	35.1		6.51	4.07	1.60	0.138	0.024	0.0033
Attracting iron onto a magnet[5]	0.61	36.9		7.06	3.48	2.03	0.127	0.119	0.0151
Backward movement of roadside plants while we travel[1]	0.62	37.9		7.46	2.95	2.53	0.102	0.222	0.0226
Making loud noise in hall[4]	0.62	38.9		7.80	4.17	1.87	0.151	0.185	0.0279
Sprouting the seeds[1]	0.63	40.0		6.32	2.96	2.13	0.106	0.200	0.0212
Science books[3]	0.64	41.1		5.24	2.92	1.79	0.105	0.208	0.0218
Connecting electric switches[4]	0.65	41.8		4.93	2.97	1.66	0.108	0.125	0.0135
Thorny plants[1]	0.65	42.5		5.13	2.60	1.98	0.089	0.149	0.0133
Computer games[4]	0.66	43.2		5.25	2.47	2.13	0.088	0.156	-0.137
Photos of astronauts[3]	0.66	43.8		5.04	2.41	2.09	0.091	0.305	0.0278
Colour wheel[4]	0.67	44.3		4.43	2.38	1.86	0.087	0.172	0.0149
Parasitic plants[1]	0.67	44.8		4.83	2.39	2.02	0.090	0.234	0.0211
Pendulum movement in clock[1]	0.67	45.2		4.32	2.06	2.09	0.072	0.240	0.0173
Making thick Jaggery[4]	0.68	45.6		3.3.2	2.09	1.59	0.071	0.257	0.0182
Feathers[3]	0.68	46.0		4.64	2.00	2.32	0.071	0.229	-0.163

**p<0.01 (19,526) df*
1,2,3,4 and 5 indicates experiences categorised under observation, visit, collection, activity and experimentation respectively

Interest in science of rural school students can be significantly predicted [R=0.68, F = 23.62 for (19,526df), p<.01] using 19 predictors out-of-school experiences. These 19 significant predictor variables in the order of their predictive efficiency, in terms of percentage influence (in parentheses) on interest in science of rural secondary school students are: Observation of parasitic animals (4.35), Collection of photos of scientists (3.88), Observation of darkening of silver ornaments (3.43), Visit to primary health centre (2.97), Making loud noise in hall (2.79), Collection of photos of astronauts (2.78), Observation of backward movement of roadside plants while we travel (2.26), Collection of science books (2.18), Sprouting the seeds (2.12), Observation of parasitic plants (2.11), Making thick jaggery (1.82), Observation of pendulum movement in clock (1.73), Collection of feathers (1.63), Attracting iron on to a magnet (1.51), Making colour wheel (1.49), Doing computer game (1.37), Connecting electric switches (1.35), Observation of thorny plants (1.33), and, Making electric current from tomato (0.33). The percentage influence of the 19 predictors out-of-school experiences together on interest in science of rural secondary school students is 46.0

In the urban sample

Result of multiple regression analysis to examine the influence of out-of-school experiences on interest in science among urban secondary school students is in Table 4.

Table 4

Results of Step-wise Multiple Regression Analysis for Interest in Science of Secondary School Students in the Urban Sample

Predictors	R	R^2x100	F	B	t	SE	b	r	βxr
Pictures of the living[3]	0.40	16.2	14.29*	12.87	3.78	3.40	0.228	0.245	0.0559
Lichens[1]	0.49	24.5		8.63	2.99	2.89	0.176	0.227	0.0399
Photos of astronauts[3]	0.56	30.8		10.16	3.54	2.88	0.216	0.341	0.0737
NPK fertilizers[1]	0.59	34.8		9.17	3.09	2.96	0.181	0.282	0.0510
Loosening of electric lines during summer[1]	0.61	37.3		8.84	3.39	2.61	0.198	0.251	0.0497
Animal movements[1]	0.63	39.1		8.29	2.68	3.09	0.161	0.255	0.0411

Rubber/sandal factory[2]	0.64	40.6		-8.98	3.31	2.71	0.201	0.122	0.0245
Flower show[2]	0.65	42.4		8.45	3.00	2.82	0.190	0.113	0.0215
Horticulture[4]	0.67	44.3		-8.09	2.94	2.76	0.170	0.263	0.0447
Using thermo utensils[4]	0.68	46.1		6.80	2.79	2.44	0.154	0.119	0.0183
Aquarium Fish exhibition[2]	0.69	47.5		-7.45	2.51	2.97	0.159	0.121	0.0192
Agriculture research centres[2]	0.69	48.9		6.47	2.26	2.80	0.136	0.182	0.0248

*Note: *p<0.01(12,179)df*
#1,2,3,4 and 5 indicates experiences categorised under observation, visit, collection, activity and experimentation respectively.

Interest in science of urban school students can be significantly predicted [R = 0.69, F = 14.29 for (12,179df), p<.01] using 12 predictors out-of-school experiences. These 12 significant predictor experiences in the order of their predictive efficiency, in terms of percentage influence (in parentheses), on interest in science of urban secondary school students are the following: Collection of photos of astronauts (7.37), Collection of pictures of the living (5.59), Observation of NPK fertilizers (5.10), Observation of loosening of electric lines during summer (4.97), Doing horticulture (4.47), Observation of animal movements (4.11), Observation of lichens (3.99), Visit to agriculture research centre (2.48), Visit to rubber/ sandal factory (2.45), Visit to flower show (2.15), Visit to aquarium/ fish exhibition (1.92), and, Using thermo-utensils (1.83). The percentage influence of the 12 predictor out-of-school experiences together on interest in science of urban school students is 48.90.

Categories and Fields of Out-of-School Experiences Influencing Interest in Science More

In order to know the relative influence of observation, visits, collection, activity and experimentation related to biological and physical sciences on interest in science of the students, percentage influence if the relevant experiences under those categories were added together, and are presented in Table 5.

Table 5

Influence of Observation, Visits, Collection, Activity and Experimentation Related to Biological and Physical Sciences on Interest in Science of Secondary School Students

Group	Experience related to the field of	Percentage influence on interest in science of					
		Category of experience					
		Obser-vation	Visits	Collect-ion	Activity	Experi-mental	Total*
Total Sample	Biological science	10.69	3.97	2.03	0	0	16.69
	Physical science	10.09	0.79	6.47	1.99	1.88	20.04
	Science (total)	20.78	4.06	13.161	1.99	1.88	*
Rural	Biological science	9.90	2.97	1.63	0	0	14.50
	Physical science	7.42	0	2.78	8.82	1.84	20.85
	Science (total)	17.32	2.97	10.022	8.82	1.84	*
Urban	Biological science	8.10	6.55	5.59	4.47	0	24.71
	Physical science	10.07	2.45	7.37	1.83	0	21.72
	Science (total)	18.17	9.00	12.96	6.30	0	*

** Total may not add up to the value of $R^2 \times 100$ as some experiences are classifiable under neither of the fields of science; 1 and 2 indicate that respectively 4.66 and 6.06 per cent were added as percentage influence of collection of books and photos of scientists.*

Percentage influence of physical science related experiences on interest in science is 20.24 in total sample, 20.85 among rural school students and 21.72 among urban school students. Percentage influence of biological science related experiences on interest in science is 16.69 in total sample, 14.50 among rural school students and 24.71 among urban school students. In the total sample the experiential influence on interest in science is the highest from observation (10.69%) and is true in rural (17.32%) and urban (18.17%) samples also. Visits and collections especially to places and objects of biological interests are manifestly more in urban sample. In the rural sample, influence of visits related to physical

science on interest in science is nil, while percentage influence of visits to places of biological interest on interest in science is 2.97. The influence of collections related to both physical science and biological science on interest in science are more in urban sample than in rural sample. Influence of activity experiences on interest in science is comparatively less in urban sample (6.30 per cent). In the rural sample, though influence of activities related to biological-science on interest in science is nil, influence of activities related to physical science is 8.82 per cent. In total as well as rural and urban samples, influence of experimentations on interest in science is very feeble. Influence of biological science related experimentations in total, rural and urban samples are nil, whereas that of physical science related experimentations are 1.88 per cent for total, 1.84 per cent for rural and zero per cent in urban students.

Conclusions

In essence this study found that locale but not gender difference is noteworthy in interest in school science in Kerala, that interest in science is decidedly influenced by out-of-school experiences, and that locale difference exists in the influence of out-of-school science experiences on interest in science. Around 40 per cent variance of interest in science is attributable to out-of-school experiences among secondary school students, while such influence is 46 per cent among rural school students and 48.9 per cent among urban school students. Thus, nearly half the variance in interest in science is attributable to variance in experience. Observational experiences influence interest in science more than collection, activity, and experimentation. Experimental experiences derived by students are not found effective enough to arouse their interest in science.

This study could not reveal gender-difference in the extent of interest in science among secondary school students. While samples other than from Kerala indicated gender-based difference in interest in science (Feldhusen and Williard-Holt, 1993; Farenga and Joyce, 1997) a previous study on Kerala upper primary school sample revealed that the difference is qualitative than quantitative (Gafoor and Smitha, 2010), and the present finding is similar to the latter. Significant difference exists between interest in science of rural and urban school students with the former having markedly higher interest than the latter, confirming the previous similar findings from India (Vani, 1997; Shukla, 2005).

Interest in science of rural students is better influenced by experiences from easily available materials and day to day life

activities, whereas for the urban school students experience from structured, organised and planned settings are found more influential. Interest in science is influenced more by physical science related experiences, especially among rural school students. Influence of organised experiences such as visits and collections on interest in science is more in urban than rural sample. Influence of activity on interest in science, mainly those related to physical sciences, is less in urban sample.

Educational Implications of the Study

Linking science with students out-of-school science experiences to enhance student interest in science requires re-examination of traditional school science in terms of contents, instructional practices, textbooks and support facilities, teacher preparation, and assessment and further research.

Science learning at least in the early years needs to be an expansion of children's natural activities of observation and exploration. Exploring the living and non-living things and playfully interacting with their environment help children learn. Constructive science experiences are found in playful exploration of their immediate environments. Mountain, sky, sea, valleys, parks, and zoo might be distant, but stimulating environments. Teachers can suggest situations that encourage collecting information about primary qualities like location, dimension, mass, number and secondary qualities like colour, smell or sound.

Observation is found influential on student interest. But, teaching until the high school was not able to use this primary tendency to trigger students' science activities and experimentation. This is evident from less than expected influence these latter categories have on student interest. Careful expression of what one observes is important in prompting students' science activities and experimentation. Children require time to talk about what they observe and to compare their observations one another. Mutual descriptions and discussions of the observations encourage one to compare experiences and to "check what you think against what you see".

True science requires abilities that exceed observation. For elder students, observations are to provide basis for explanations, beyond mere descriptions and discussions. Observation ought to work as springboard for refined questions, beyond what, how, when, and why of things, to evaluate "what counts" as scientific knowledge. Findings

reveal that students' experiences from experiments have feeble effect on their interest in science. Repetition of past experiments is not the best way of exciting the spirit of science. Science learning activities should challenge, but not overly frustrate. Teachers have to find ways to keep children's natural yearning for learning burning by engaging them in motivating activities, by not forcing them to do. Genuine student involvement is the key to the stimulation of interest and intellectual development.

Arranged but less formal experiences have impact on student interests. Effect of visits on urban school students' interest in science is noticeable. Opportunity for rural students too for field-visits is to be thought upon. Structured activities and experiences are integral to an instruction for the development of interest in science. Influence of indirect experiences from books and computers on interest in science of students is evident in findings of this study. Bridging classrooms with media is one way to relate science teaching with the world outside. Movies, television, magazines, newspapers, books, and computer can bring in a lot of experiences into the classroom and thus, generate interest in science. Development of a school museum devoted to science will help students to structure the experience from collection better.

Impact of out-of-school experiences on science learning must be borne in mind while imparting instruction. For every unit, decide the major concepts and identify corresponding experiences from out-of-school. For achieving the affective goals of education the most appropriate, responsive, relevant, and reliable curriculum is a local one. At the start of every unit, relating the topic to the world outside the classroom works as a catalyst for setting the mind and body to really involve in learning. Before they begin a new topic, related materials be made available for students to get an opportunity to explore freely and prompt questions related to the topic. Linking out-of school experiences and systematic instruction is but a way of integrating right brain and left brain functioning, and thus of integrating achievement with attitudes.

Schools cannot ignore the urban-rural disparity in out-of-school experiences, as out-of-school experiences are highly influential on interest in science. Providing more computers and better lab facilities supplemented with frequent educational excursions to places of scientific interest might be one-step for rural children to get more experience and to further their interest in science. Interest in science can be enhanced through intervention that make use of

out-of-school experiences as symposia, science centres, puzzles, field based scientific investigations, summer science programmes, visits to space stations, field trips and garden based activities.

What students learn from textbooks be an extension of and be reinforced by out-of-school experiences. Science text books should be sources of interesting ideas, references and activities, rather than words to be memorised. Suggested activities should not be directed and "cookbook" in nature. On topics that can't be studied in depth or for which a hands-on approach is not possible, chapter need be useful to read as summaries. And teacher has to seek out activities and local examples to complement and to keep students interested in the subject.

Though observational skills are basic to science, guidelines to differentiate between the observations, say, of a first grader from those of an eighth grader are vague. The age-appropriateness of concrete learning strategies is ambiguous. Hence, teacher-incorporated activities tend to stress lower level skills such as information gathering, remembering, and organising rather than higher level skills classifying, inferring, theorising, generalising, hypothesising, and predicting. Further, research is needed to tune activity-based learning to the age of learner.

How teachers assess and what they assess has a major impact on the implemented curriculum. Assessment focuses learning activities in science classrooms. Educators are to develop better means of measuring kinds of understanding students acquire through activities. Evaluation of experience-based-learning has to be informal, majorly via unobtrusive observations. Teacher's observations should be recorded in writing, and if possible in detail. This can serve in planning further instruction, as a record of progress and attainment.

Beyond sheer possession of appropriate conceptual framework of the subject, teachers need to enrich their experiential repertoire through reading, observation, discussion with colleagues, and the like. Recognition of the aspects of science that students enjoy will help teachers to elicit and address student ideas, and to personalise students' learning experiences. Teachers having inadequate understanding of out-of-school experiences may discourage further discussion of student ideas. Teachers have to share their science interests and seize the ensuing teachable moments. Sharing teacher's hobbies such as keeping an aquarium or pets, or fixing electric circuits, create excitement that is contagious. Science

learning begins hands-on which stir students' mind-on to make their heads-on. Classroom science has to become a way of observing, a way of thinking about the experiences, a way of sharing these thoughts to others, and, a way of verifying what one think against what one see and share, in order to improve students' understanding of the world.

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Effects of School Language-Home Language Gap on Primary Education: A Study of First Generation Learners of Disadvantaged Groups

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Abstract

Annual Status of Education Report (ASER) estimates that 44 per cent children in government primary schools of India in standard fifth cannot read a standard two text (ASER, 2008, 2009). High dropout rate from primary and elementary education combined with such poor performance in reading poses a serious challenge before Sarva Shiksha Abhiyan, which aims at universal quality elementary education. Acquisition of reading and writing skills is the prerequisite for any successful school learning. One of the important reasons for this poor performance in reading may be the difference between curricular language and home language. The school language may be entirely different from the language children are used to at home. This dichotomy in language can pose barriers in comprehension that impede children's learning, especially of first generation learners from working Class backgrounds as they lack additional support structures from home. In such situations it is the school's responsibility to facilitate the process of transition from the home language to the school language. The present paper discusses such an effort carried out in the schools of Varanasi district of UP. This project was financially supported by UGC.

Introduction

Widespread literacy has been a desired goal in India since independence. However, there is a wide gap between the stated goal in the Constitution and in reality. Even though the percentage of literacy has increased, the number of out-of-school children and the dropout rate from school is a nightmare. Most people who are considered literate are incapable of comprehending what they read. In our country for a majority of children the primary responsibility of facilitating reading falls on schools, the only learning site available to them.

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The importance of reading skills for young children is beyond doubt because it is crucial and vital for any other learning. Reading is most difficult for students because it involves the combination of many skills and cognitive abilities. Reading is a process of finding meaning in written words. A good reading competence is a necessity for academic studies, professional success and personal development. In pedagogic literature reading is recognised as a distinct development area in the formative years of schooling. But beyond educational goals reading is also a source of enjoyment and pleasure. If a child is competent in reading and likes to read, a new world of knowledge will be open for him/her. Reading for pleasure has not been given much of importance in Indian schools and it remains more a theoretical concept. Millions of children learn reading every year but fail to achieve lasting reading skills.

Several methods of teaching of reading have been proposed and advocated from time to time and these can be classified in to two broad groups (Fries, 1963; Gray, 1956), 'synthetic method' and 'analytic method'. The alphabetic method included in the analytic method was the standard method of teaching reading for alphabetic orthographies for at least 3000 years until the 19th century. By the second half of the nineteenth century the alphabetic method was losing its dominance (Smith, 1965) and three alternative methods of teaching reading came into existence: phonic method, look and say method, and sentence method (Farnie, 1985). Late in the 19th century, the sentence method, which was more global than Look and Say, was advocated in the United States. The rationale of this method was that language is recognised in whole units that express thoughts. Hence, the teaching of reading commenced with the meaningful reading of these whole units that are sentence rather than letters or words (Smith, 1965). From the turn of the century until the 1920s, the story method was a quite popular global successor to the Sentence method in the United States. Subsequently, in 1960s and 1970s the Language Experience Approach to teaching reading gave birth in part to Whole Language Approach. Whole Language, however, has a stronger emphasis on wholeness and integrity of the literary activities in which children engage. Authentic literature for learners, including beginner readers, is advocated (Goodman, 1989). In this approach, it is important to start with reading of books rather than rote recitation of alphabets. Separate letters of the alphabets do not mean anything. Reading is not an isolated behaviour. It involves simultaneous processing of all

three types of clues: graphophonemic clues (shapes of letters and sound associated with it), syntactic clues (word order); and semantic clues (meaning of the words).

Sadly, methods used in India for the teaching of reading in early classes are quite obsolete and incapable of sustaining the child's motivation. Rather these traditional alphabetic methods turn reading into a chore (Kumar, 2008). The whole process is so irrational and exhausting that it is hardly surprising to find government primary school children unable to read comfortably even in Class V. Though all children who enter school have a good command over spoken language, they fail to comprehend standard curricular or school language. This dichotomy of language affects adversely first generation learners of deprived sections because they have limited vocabulary, lack print rich environment, and negligible support at their home. Thus, the primary responsibility to make students learn to read lies with schools. There is an urgent need to bridge the gap between the home language and the school language. It requires a different kind of reading pedagogy, which must be sensitive to the vernacular language and at the same time can help the process of transition from spoken to written language. With this background the present study has been undertaken to fulfill the following objectives.

Objectives of the Study:

- To assess the impact of school versus home language dichotomy on learning outcomes of students.
- To study the impact of dichotomy of language on drop outs and failure in primary education.
- To propose a paradigm of micro-level planning for bridging the gap between home language and school language.

Sample and Selection of the Schools:

Initially, it was planned to select one school for the purpose of study, but the actual number of first generation learners of disadvantaged groups regularly attending the school in Class IV and V was small in a school as students are enrolled, but are not attending school (long term absentees). In order to have a reasonable number of Class IV and V students, four government primary schools located in slum or nearby slum areas of Varanasi city were selected through purposive sampling. The sample comprised all the students enrolled in Class IV and V in the session 2008-09 in the four schools mentioned above. Besides this, all regular (05) as well as contractual (08) teachers were also part of the sample.

Sample Description

Table 1

School	Class IV		Class V		Total
	Boys	Girls	Boys	Girls	
School 1	07	08	07	06	28
School 2	00	00	04	02	06
School 3	03	01	02	00	06
School 4	03	03	01	03	10
Total	13	11	14	12	50

Table 2

Category	No, of Students		Total no. of Students
	Boys	Girls	
SC	14	12	26
OBC	10	10	20
Minority (Muslim)	03	01	04
Total	27	23	50

Tools

The following self developed tools were used to achieve the objectives of the study:

1. Tests for Class IV and V were constructed in the subjects Hindi, Mathematics, and Social Studies to measure the comprehension of standard curricular language i.e., pronunciation, meaning, and its usage in their own sentences or contexts. Besides this, the students were asked to read a passage of their choice from Hindi text book. While administering the test students were asked to tell their own words (if they knew in local dialect) which they use to understand or describe a concept or phenomenon.
2. A self developed interview schedule was used for teachers to enquire into the problem of students' language and strategies or measures they adopt to address these issues within and outside the classroom.

Research Procedure

Tests were administered orally on all students of the sample (50) in 2008-09. It was found that in all the schools students' reading ability and comprehension level of language was very low in all the subjects i.e., Hindi, Social Studies, and Mathematics. In the next

stage of study 15 students of Class IV (promoted to Class V in the session 2009-10) of the school-1, who performed very poorly on the test were selected for the treatment. All these students were declared 'Pass' in their Class IV examination. These students were chosen because they were attending school regularly. All of them were first generation learners of deprived sections. At the beginning of new session 2009-10, an activity-based treatment was given to these students for 45 working days. After the treatment the same test was administered to measure students' comprehension of school/ standard curricular language.

Result and Interpretation

Table 3
Pronunciation level of Students in Class IV-V (Pre treatment)

Subject	Pronunciation Level # (No. of students)				Total no. of students
	Good	Average	Poor	Very Poor	
Hindi	04 (8)*	06 (12)	10 (20)	30 (60)	50
Social Studies	04 (8)	07 (14)	09 (18)	30 (60)	
Mathematics	02 (4)	05 (10)	09 (18)	33 (66)	

** Figures in parentheses are in percentage*

#Pronunciation Level

Good – pronounced more than 60 per cent of the words given in the test.

Average – pronounced between 40 to 60 per cent of the words given in the test.

Poor – pronounced more than 10 but less than 40 per cent of the words given in the test.

Very Poor – pronounced less than 10 per cent of the words given in the test.

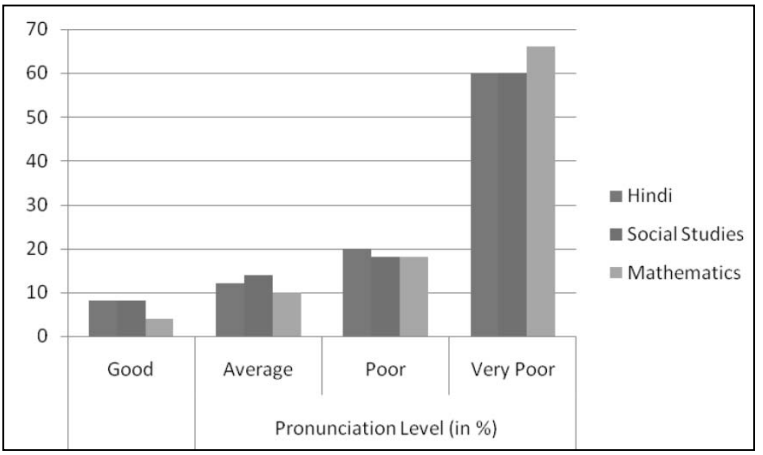

Fig. 1 *Pronunciation level of Students in Class IV-V (Pre-treatment)*

It is evident from Table- 3 and Figure-1 that 60 per cent students of the sample pronounce less than 10 per cent of words given in the tests of Hindi and Social Studies. Situation is so bad that there are some students (mostly girls) in the sample who could not pronounce a single word. Only 8 per cent students were able to pronounce more than 60 per cent of the words of Hindi and Social Studies, for Mathematics number of students even goes down further to 4 per cent students and 66 per cent students are in very poor category. An analysis of test results showed that most of the students were unable to pronounce the joint letter words, Hindi words having Sanskrit overtones, and the words which are uncommon in common usage or used only in the framework of particular discipline.

Table 4
Comprehension Levels of Students in Class IV-V (Pre-treatment)

Comprehension Level in	Able to tell the meaning of 50% words of the Test (number of students)	Able to make meaningful sentences with the help of given words (number of students)	Total no. of students in the sample
Hindi	04 (8)*	02 (4)	50
Social Studies	05 (10)	02 (4)	
Mathematics	00	00	

**Figures in parentheses are in percentage*

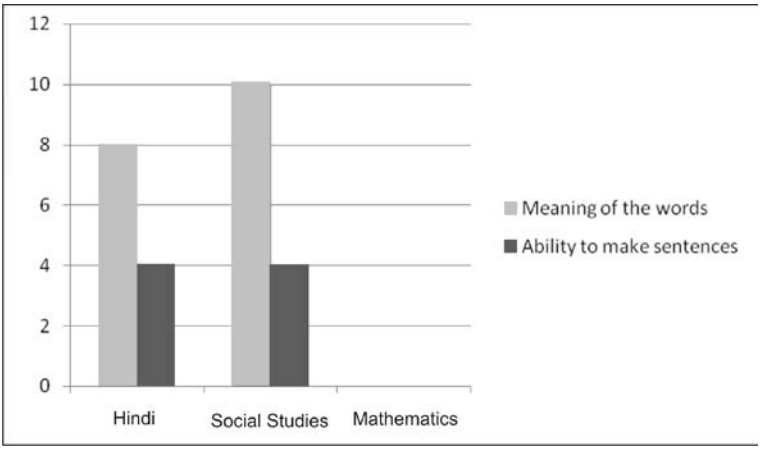

Fig. 2 *Comprehension levels of Students in Class IV-V (Pre-treatment)*

Table 4 and Figure-2 reveals that only 8-10 per cent students are able to tell the meaning of at least 50 per cent of the words in Hindi and Social Studies and 4 per cent of them can use a few words to make meaningful sentences. In Mathematics there wasn't a single student who can tell the meaning of the words given in the test. It is surprising how these students got promotion to higher Class (IV-V) over the years without learning anything.

Table 5
Percentage of Students Who can Read a Passage from Hindi Textbook

Reading	No. and % of Students
Satisfactory	04 (8)*
Unsatisfactory	46 (92)
Total	50

** Figures in parentheses are in percentage*

Satisfactory Reading — able to read the passage fluently with proper intonation, punctuation marks and can understand what he/she is reading.

Unsatisfactory Reading — cannot read the passage fluently with proper intonation, punctuation marks and cannot understand what he/she is reading.

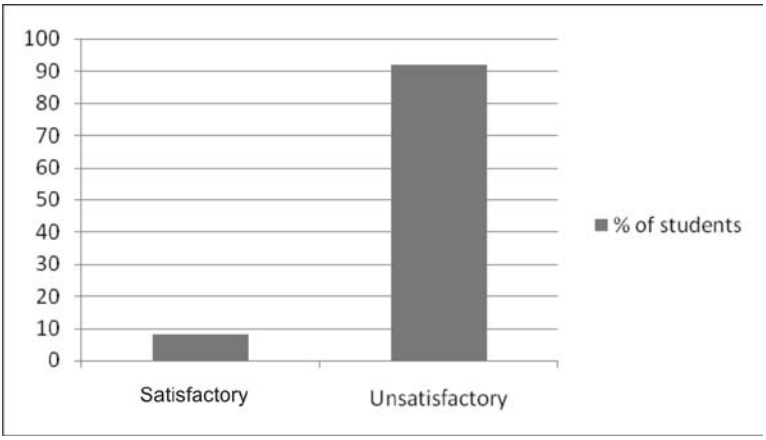

Fig. 3 *Percentage of Students Who can Read a Passage from Hindi Textbook*

Interpretation: It is evident from Table 5 and Figure-3 that 92 per cent students of the sample can't read a passage from their Hindi text book fluently. Only 8 per cent students from the sample of 50 can read the passage in somewhat fluent manner and these students got the maximum opportunity to read in the classroom. During data collection process it was observed by the researcher that some of the students who could not pronounce the word and were unable to tell the meaning of the words, asked:

"Didi ji likh kar dikha dein?" (Madam, can we show in writing?). It seems that students can't pronounce or read meaningfully but they can copy the same pattern of letters from the textbook, apparently without understanding what they are writing. Muscular maturity provided them that eye-hand-coordination, which is required for copying but recognition and decoding of written words is a cognitive ability and one has to learn reading and decipher meaning out of written words. It was observed by the researcher that most of the times in the school students were busy copying words or text either from the textbooks or from the black-board. They were seldom allowed to read and reading opportunity was given only to those one or two students who were fluent in reading, the rest of the students remained seated silently.

Responses of teachers

All 5 regular and 8 contractual teachers of all the schools were interviewed regarding the student's difficulty in reading and

comprehension. In response to the question that all students must be given the opportunity to read, teachers simply said, *"ye padh nahin sakte"* (they can't read). All the teachers unanimously agreed that most of students have problem in reading as most of them do not speak Hindi but Bhojpuri (local dialect) at home. In response to the questions 'what do they do to address this problem? Do they use Bhojpuri (local dialect) for instruction or for explaining a concept?' all of them except one said that they don't, though they were familiar with it and can understand Bhojpuri.

Teachers were indifferent towards their students and some of them had the strong notion that it is futile to make any attempt to teach them. It seems from their responses that they don't consider that it is schools' and teachers' responsibility to make all students able to read and write meaningfully. One of the teachers remarked, *"ye roj nahin aate aur ghar mein bhi nahin padhte isiliye sikh nahin pate"* (students are not regular and don't study at home, that is why they are not learning). All the regular teachers said that they were over burdened with administrative work, hence don't find enough time to teach. There was shortage of permanent teachers in all the four schools and they were managing with the help of contractual teachers.

Cohort Analysis: To achieve a second objective of the study a Class wise cohort analysis of the students was done to find out dropouts and failure in selected schools.

Table 6
Cohort Analysis

	No. of students admitted in Class I in 2004-05	New students joined the Same cohort at the level of Class II, III, and IV (2006-07)	No. of students reached in Class V in 2008-09
School 1	111	34	30
School 2	43	10	07
School 3	31	None	06
School 4	#	None	20

 # School did not provide previous years' records.

It is evident from Table 6 that dropout rate between Classes I to V is as high as 80 to 86 per cent. It means that out of 100 students admitted in the Class I only 20 to 15 students reach to Class V level. Dropout rate for schools 1, 2 and 3 is 79.32 per cent,

86.8 per cent and 80.65 per cent respectively. School-4 did not give enrolment figures of previous years. This situation is alarming because no students were declared 'failed' in school records due to zero detention policy in primary classes. It means that students did not dropout of school because they failed. It can be said that students left school because they were unable to read, write and thus making any sense of school learning. Results of student's comprehension of school language (tables -3, 4, and 5) support this fact. It is one of the most significant reasons because parents were complaining informally that their wards are not learning much in school. Attending school regularly does not make any difference in their life so they remained absent from school for a long time. In informal talk one of the parents said,

"Muft hai tab bhi roj school jane se kya fayada agar wah kuch padhana likhana nahin sikh raha hai" (though it is free, what is the point to attend school regularly if he is not learning basic reading, writing, and numeric abilities). It is evident from Table 6 that chances to complete five years of schooling for a first generation learner of deprived section is very meager.

Treatment: 15 very poor readers (8 boys and 7 girls) of school- 1 were selected for activity-based treatment. All these students were attending school regularly. Inputs from classroom observations, interviews of teachers, were incorporated in the selection, design, and execution of activities. Pre-treatment assessment of students' comprehension of standard curricular language helped in selecting the level of activity to start with. The whole activity lasted for one and half months.

Plan of Work (Treatment):

1. Students were given ample opportunity to talk.
2. Researcher noted down the different indigenous (Bhojpuri) words used by the students for various objects and concepts.
3. A series of activities were organised as suggested in the handbook, 'The Child's Language and the Teacher' by Kumar, K. 2000. Some of the activities given in the handbook were used during talk sessions and for the teaching of reading. Besides this, words from the local dialect (Bhojpuri) used by the students have been utilised for bridging the gap between home language and school language and it was used for instruction and explanation too whenever needed. The whole treatment was divided into two broad categories,

Table 7
Description of Activities

S.No.	Activity	Number of Days
A.	Talk	
A.1.	Opportunities to talk about oneself	3
A.2.	What did you see	3
A.3.	Asking the Explorers	3
A.4.	Guess What I Saw	3
A.5.	Analying the Pictures	3
A.6.	Opportunities to talk about objects and experiences at school	4
	Total number of Days	**19**
B.	Read	
B.1.	Story Telling and Reading of Story Books	12
B.2.	Dividing the Alphabet	4
B.3.	Reading Science	2
B.4.	Doing What You Read	2
B.5.	Last Word, Next Word	4
B.6.	Three Questions	2
	Total number of Days	**26**

The Child's Language and the Teacher, (Kumar, K. 2000).

Talk

Opportunity and the freedom were given to all the selected children to talk about their life and hobbies. Initially, children's talk was incoherent, repetitive, and formal e.g. in response to the question, what do they like? all of them said that, "*Padhai achchhi lagti hai*" (they like to study), children usually talked about domestic violence faced by them. All the activities were very helpful to shed the initial inhibition of students of talking in front of the teacher and it served as an excellent ice breaker. 'Analysing the pictures' was the most helpful activity in listing Bhojpuri words spoken by students.

Reading

Six kinds of activities were used in the classroom to encourage children to read. Whole language approach to reading was adopted. For meaningful reading selection of books for the children is the most important, for the present study 'Barkha Series', a collection of forty books published by NCERT for the teaching of reading was used. These story books have bright, colourful illustrations based on stories side by side written words are ideal books to start with. For this activity all the 15 students and researcher sat on the ground so that all the students can see the book while reading. It was suggested in the handbook (Kumar, 2000) that it should not be plain aloud reading of only written words so sometimes researcher elaborated by adding details or shortened the story by using her own words. Researcher had prior familiarity with stories as it was necessary.

Reading book sessions generated much interest and familiarity with books among students and helped in developing all the three types of clues that any use of language consists of i.e. graphophonemic clues, syntactic clues, and semantic clue. At this point no questions were asked. It was just to get students familiar with print and fun of getting meaning out of it. Response of the story reading sessions was so encouraging that after one week students started asking for books of their choice.

After this activity-based treatment students moved to their Class V textbooks. With the newly gained confidence they started reading. Researcher remained there for the next one and half months to help the learners as per need. After that the researcher administered the same language comprehension test on all 15 students. Results of the post-treatment are given in Table 7 and 8.

Table 8
Post-Treatment Students' Language Comprehension level
(Number and % of students)

Comprehension in	Pronunciation Level Good#	Ability to tell the Meaning		No. of students got the treatment
		Average*	Above Average**	
Hindi	15 (100 %)	10 (66 %)	5 (33%)	15
Social Studies	15 (100%)	9 (60 %)	6 (40 %)	
Mathematics	15 (100%)	12(80%)	3 (20%)	

 # Good- Able to pronounce more than 60 per cent of the words given in the test
** Average - Able to tell the meaning of 50 per cent of the words given in the test.*
*** Above Average - Able to tell the meaning of more than 50 per cent of the words given in the test.*

Interpretation

It is evident from Table 7 that after the treatment, students' performance has been improved significantly. All 15 students who received treatment were able to pronounce more than 60 per cent of the words given in the test of Hindi, Social Studies, and Mathematics. Ability to decipher meaning is shown in Table 7 into two categories average and above average. Out of total 15 students 10, 09 and 12 students told the meaning of 50 per cent of the words of the test of Hindi, S.S.T., and Mathematics respectively and are in the average category. However, the number of students who described the meaning of more than 50 per cent of the words and in the above average category is low as it is 5 students in Hindi, 6 students in S.S.T., and only 3 students in Mathematics test. But if we compare these numbers to the performance of pre-test scores, almost all students scored better. Improvement in students' performance is evident in all the subjects but the gains are more in Hindi and SST than in Mathematics.

Table 9
Post-Treatment Students' Language Comprehension level

Comprehension in	Make Meaningful Sentences Using Words (No. of Students)		
	Up to 40 % of the words	More than 40% but less than 55% words	No. of Students got the Treatment
Hindi	12	03	15
Social Studies	14	01	
Mathematics	14	01	

Interpretation

Table 8 shows that intensive activity-based treatment has improved students' capacity to use the language (words) in different contexts or in their own contexts. Out of 15 students 12 students in Hindi, 14 students in S.S.T. and Mathematics were able to use up to 40 per cent of the words given in the test to make meaningful sentences. Though no student of the sample used more than 55 per cent of the words to make meaningful sentences, but this achievement is significant as all these students were poor readers, who performed poorly on all the dimensions of the pre-test i.e., pronunciation, tell the meaning and use of the words to make meaningful sentences.

The post-treatment scores show that performance of students has improved after undergoing through an activity-based treatment,

which helped transition from spoken to standard curricular language and the first generation learners of disadvantaged groups benefited by this exercise. It enhanced their limited vocabulary and aroused interest and love for books and reading.

Conclusion

On the basis of above findings it may be concluded that,

1. School and home language opposition affects student's achievement adversely and due to it students are not able to read and understand the school subjects as language cuts across all the disciplines.
2. Inability to read meaningfully is one of the major causes of dropout from government primary schools as students are not making any sense of school learning.
3. An intense activity-based programme designed as per the need of students to bridge the gap between the home language and the standard curricular/school language is proved to be useful. After going through this programme students' comprehension of school language has improved significantly.

Implications of the Study

The true spirit of *Sarva Shiksha Abhiyan* is to make all children learn read and write meaningfully. Due to various initiatives taken in SSA, a lot of first generation learners are now in primary schools, but unfortunately most of them are not learning (ASER, 2008, 2009). High dropout rate is a serious concern because the purpose of elementary education is defeated if all the children are not completing five years of schooling successfully. High dropout rate contributes to wastage in primary education. In the light of findings of the present study and other studies including ASER, 2008 and 2009 it can be said that most students dropout from school because they are unable to make sense of school learning due to inability to read. It is interesting to note that all the children when they enter in school have a good command over spoken language but fail to comprehend standard curricular or school language. The findings of the present study show that with careful planning transition from home language to school language is possible and students' performance can be improved significantly. The findings of the study have special significance for the planning of 'Residential Bridge Course' under Sarva Shiksha Abhiyan for the mainstreaming of dropouts and out-of-school children.

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Assistive Technology for Students with Visual Impairments: A Path Revisited

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ABSTRACT

The paper aims to look at the significance of assistive technologies for the education of persons with visual impairments. In this context, it makes an attempt to analyse some of the benefits of assistive technologies and their usage for providing a quality education to such people. It also provides a critical review of the limitations of such technologies that needs to be addressed to facilitate their better instruction and integration.

"New information and communications technologies can improve the quality of life for people with disabilities, but only if such technologies are designed from the beginning so that everyone can use them...." - Bill Clinton

In the age of incessant technological advancement there is tremendous demand for incorporation of new and modern programmes and methods in order to ensure greater adaptability with the pace of rapid competition. The same holds true for people with disabilities all over the world. Visualisation which is regarded an inevitable medium for people to adapt to complex information as well as to navigate around structured information, the visually challenged are placed at a vulnerable position by nature. However, the situation seems to be undergoing rapid and more positive changes with the ushering in of new technological interventions.

The opportunity to access and interact with text, both printed and electronic, continues to be fundamental to education in the information age. Appropriate assistive technology has enabled students who are visually impaired to access information and to complete tasks efficiently enabling them to achieve the highest level of independence possible. Emerging research suggests that technology promotes acquisition of literacy, provides more equal access to information required for employment, and for access

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to information, in general, and facilitates social and community networks (Kelly and Smith, 2011). In recent years, assistive technology has enabled people with visual impairment to overcome stereotypes and to function efficiently in diverse professions of life.

The most important advancement since blind assistive technology began to appear in the 1970s is the screen reading software, which simulates the human voice reading the text on computer screen or renders hard-copy output into Braille. Screen reading software such as JAWS, Job access with Speech, by Freedom Scientific, Window-Eyes by GW Micro, and Serotek are being used widely by the visually impaired students to read the text appearing on the screen. Their ease in operation by keyboard commands and the options of Braille display and a synthetic voice facilitates better instruction. Given the current state of technologies for displaying refreshable braille or magnified text, paired with speech driven by screen reader technology, students can now access information available in text through multiple modalities. The optical character recognition which scans and reads the text aloud has enabled students with visual impairments to access all types of print materials by using this scanning technology. Portable reading devices are now being used to download books and read them out loud in a synthesised voice such as the Victor Reader Stream and the BookSense.

The apparent benefits of Audio Supported Reading (ASR) suggest that rather than teaching the skills essential for braille reading, print reading, and listening in isolation as separate pedagogies, a more robust and integrated approach for teaching and acquiring literacy skills will be more advantageous. In today's era of general curriculum access and high stakes testing, it is imperative that new practices and pedagogies be examined with a view to improving results for these students, many of whom lag far behind their typically seeing counterparts. In addition to computers and other devices, talking clocks and thermometers, specialised bar code scanners, and palm pilots all make daily life, education and employment more accessible for people with vision impairment. The GPS system including BrailleNote GPS, Street Talk™, Trekker, and Mobile GEO have also taken a lead in facilitating mobility of people with visual impairment.

Lowenfeld (1973) determined that there were three primary issues facing individuals with visual impairments: access to information, independent travel and lack of meaningful experiences. Assistive technology is used by individuals with visual impairments to compensate for these limitations, achieve educational success,

gain competitive employment by providing tools for increased independent access to information and for effective communication. The current challenge is to provide appropriate access to and instruction on blindness and low vision specific assistive technology through individualised assessment of assistive technology needs, appropriate instruction in the use of assistive technology as tools and equitable distribution of assistive technology.

Issues and Challenges

Although the need for and benefit of assistive technology has been well-documented throughout literature, there are various complex issues that often restricts the use of assistive technology devices and software. One such problem centers on the fact that most of the provision of assistive technology are not based on the particular needs of individual but upon disability. There is frequent ignorance of the fact that even students with the same visual loss may require instruction in different types of assistive technology based upon their unique needs. Besides this it is also imperative to take into account that determination of access mode(s) i.e. speech access, braille access, print access, tactile communication systems, etc. and must be guided by skilled specialists in the education of students with visual impairments who have comprehensive expertise in blindness and low vision specific assistive technology and who can also access individual learning characteristics.

There is also the need to diagnose the specific needs of students with visual impairments followed by proper planning, implementation, and continuous monitoring instruction in the use of appropriate technology. Students with visual impairments will not be included unless their unique educational needs for access are addressed by specially trained personnel in appropriate environments and unless these students are provided with equal access to core and specialised curricula through appropriate specialised books, materials and equipments. Hence, it is imperative that efforts must be directed towards appropriate instruction including designing a plan of individualised assistive technology instruction and teaching a specialised hierarchy of skills that is based upon diagnostic evaluations. Instruction in the use of appropriate assistive technology devices such as speech, large print, Braille must take place concurrently with instruction in keyboarding, word processing, and use of the Internet. Appropriate instruction also needs to be provided concerning introduction to or mastery

of other blindness and low vision specific assistive technology devices such as electronic note takers, scanners, optical character recognition (OCR) systems, braille translation software, braille and print embossers, screen magnification software, etc.

Access to and instruction with assistive technology must be driven by individual needs, not by logistical constraints such as availability of equipments, location or model of service delivery, or funding restraints. Currently, some students with visual impairments have access to a wide range of blindness and low vision specific assistive technology devices while others have none at all (Kelly, 2008). In inclusive classrooms, students with disabilities do not always have access to the same learning tools as their classmates. For instance while the students with visual impairments have to rely on alternative-format books, such as large print or Braille as compared to their sighted counterparts who access written text, the former are dependent on their teachers and peers to describe the matter to them and also in certain cases visual materials may never be adapted. Moreover, though use of Educational Software has become an important tool and their use is continuously being emphasised on in classrooms it poses certain challenges for the students with disabilities. For instance while a sighted student can learn a biology lesson based on interactive simulation, a student with low vision may have to depend on assistive interactive software for experimental. Though the accessible software can contribute positively towards filling in some of the gaps resulting from lack of exposure to a wide range of activities the issue of proper accessibility and training becomes important.

Instruction by qualified educational professionals is often hindered by lack of pre-service and in-service training in assistive technologies. It is evident from research that some students with visual impairments have access to teachers who are well-prepared to deliver special instruction in blindness and low vision specific assistive technology, while others do not and Edwards and Lewis, 1998; Kapperman, Sticken, and Heinze, 2002; Murphy, Hatton, and Erickson, 2008; Parker et al., 1990; Sahfi, Zhou, Smith, Kelley, 2009; Smith, Kelley, Maushak, Griffin-Shirley, and Lan, 2009). Hence, there is the urge to eliminate this inequity. Opportunities must be provided for professional development through partnerships among school, universities, organisations as well as assistive technology vendors to ensure that professionals keep abreast of emerging technologies.

Factors such as location, cost, and personnel often hinder the availability of assistive technologies for individuals with visual impairments. The main problems are not only associated with designing the electronic circuitry for a satisfactory electronic mobility aid but in identifying the optimum information needed for independent traveling, displaying this information to the blind persons in a non-visual format i.e. auditory or vibratory signals, manufacturing the device at a reasonable price and finally training of the blind persons in the use of these devices. Referring to issue of structural adaptations for effective orientation and mobility of the visually challenged as well as other forms of disabilities most of the schools in India do not possess many of the prescribed infrastructural standards as specified by the 1995 Disability Act. There is still lack of basic requirements such as ramps, adequate Braille books etc. Morever though embossed maps can be used in familiarising a visually challenged person with the layout of the environment they are not easy to produce or interpret since just embossing a sighted map may not ensure an intelligible embossed map.

Limited awareness among non-specialist sighted users about the difficulties encountered by the visually impaired users in adapting to the new technology such as investing a great deal of time in learning the command structure and operation of the speech, Braille, or text display system can further hinder in providing assistance. Hence, attempt should be made towards providing structured training so as to bring positive benefits to those who need to use technology for a specific range of tasks.

Suggestions

It is important that schools must ensure that all students have equitable access to assistive technology devices and instruction as documented by the individualised education programme. School and university programmes must address the lack of blindness and low vision specific assistive technology knowledge among the future teachers of students with visual impairments. Opportunities for professional development needs to be provided through partnerships among school districts, universities, organisations as well as assistive technology vendors to ensure that professionals keep abreast of emerging technologies and have the opportunity to become proficient in the use of the assistive technology. There is also the need to bring separate pedagogies together in a unified

instructional design. Learning to read with Braille or print, learning to listen, and learning to use technology must all come together to create authentic classroom activities.

Conclusion

A significant challenge in education for both visually-impaired and deaf is that they are a minority population and often have less guided practice in communication. As a result, they have limited interaction with the larger community, which would normally reinforce their literacy and communication skills. Although inadequate teacher training, lack of awareness, infrastructural deficiency and high cost are some of the major problems in the use of technology but willingness, appropriate effort and positive outlook can play significant role reducing some of these shortcomings. This perfectly relates to the words of James Baldwin "Not everything that is faced can be changed, but nothing can be changed until it is faced."

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Emotional Intelligence in Relation to Occupational Self-efficacy and Personality of Secondary School Teachers

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Abstract

This study endeavoured (i) to assess the level of emotional intelligence of secondary school teachers, and (ii) to study the influence of occupational self-efficacy, personality and their interaction on emotional intelligence of secondary school teachers. A sample of 240 secondary school female teachers was randomly selected from various secondary schools of state Haryana. Data analysis revealed (i) significant independent effect of occupational self-efficacy and personality on emotional intelligence; and (ii) significant two factor interactive effect of variables on interpersonal management skill of secondary school teachers.

Keywords: Emotional Intelligence, Occupational self-efficacy, Personality, Secondary school teachers

Introduction

Salovey and Mayer (1990) first introduced emotional intelligence conceptualising it as "a form of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions." Goleman (1995) expanded Salovey and Mayer's work to consider how emotional intelligence differed from cognitive intelligence, or I.Q., which has been shown to be a week predictor of job performance (Sternberg and Detterman, 1986). Instead, what seemed to be the most significant predictors of performance and success were more affective abilities such as emotional control and the ability to get along with others. Goleman (1995) offered a definition of emotional intelligence as "the capacity for recognising our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our

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relationships." In light of the findings cited above, Goleman (1995) posited human competencies like self-awareness, self-discipline; persistence and empathy are of greater consequence than IQ in predicting performance.

The popularity of emotional intelligence during the past decade has led researchers to examine its potency in various areas of humans functioning. Thus, it has been found that emotional intelligence is related to life success (Bar-on, 2001), life satisfaction and well being (Palmer, Walls, Bergess, and Stough, 2002), interpersonal relationships (Fitness, 2001). Some other empirical studies have also found emotional intelligence as an important tool related to positive criterion such as prosocial behaviour, parental warmth, and positive family and peer relations (Mayer, Caruso and Salovey, 1999; Rice, 1999; Salovey, Mayer, Caruso and Lopes, 2001).

The measures of emotional intelligent competencies have also been shown to relate to other selected personality measures. Emotional intelligence has shown associations with Type B personality, Myers Briggs measures of intuiting and feeling; and the NEO-PR measures of extroversion (Byrne,2004). In his study to determine whether a relationship exists between personality (Types A and B) and emotional intelligence, found that people with a mixture of both Type A and Type B were higher in emotional intelligence. Furthermore, it was found that Type B was positively correlated with social skills competencies (Cited at Reed, 2005).

From literature review, it appears that emotional intelligence provides a very unique kind of ability by linking cognitive and affective sphere of human personality. Numbers of personal, social and personality factors seem to affect emotional intelligence to a great extent. One has to concede to the fact that emotional intelligence is environmental in nature and can be learned and increased over lifetime of an individual.

Study Rationale

The aim of an education is the all round development of the child. In the pursuit of this goal, teachers play a significant role. Along with the design and execution of an intelligent curriculum, its effective implementation requires an emotionally intelligent teacher who can sense the slightest changes in the classroom and can manoeuvre the teaching strategies accordingly. An emotionally intelligent teacher

can bring about a positive social and behavioural change in the students by presenting before him a model behaviour and emotional intelligence in his day to day teaching and dealing with the students. Thus, in order to identify and develop such characteristics in our teachers, we need to assess the emotional intelligence of teachers.

It is clear from research that teachers have great potential to effect students' educational outcomes (Anderson, 2004). There is substantial evidence indicating that schools make a difference in terms of student achievement, and the significant factor in that difference is attributable to teachers. Effective teachers can do wonders in classrooms. Effective teachers believe that they can make a difference in student learning outcomes and they teach in a way that demonstrates that belief (Gibbs, 2002). Teacher effectiveness is governed by levels of self-efficacy, that is, the belief teachers have about their teaching capabilities (Gibbs, 2002; Tschannen-Moran, Woolfolk-Hoy and Hoy, 1998). Departments of education acknowledge this link between teacher effectiveness and teacher self-efficacy. Teachers who have "a high sense of efficacy about their teaching capabilities can motivate their students and enhance their students' cognitive development" (Bandura, 1994).

Sutton and Wheatley (2003) suggest that "the substantial variation in teacher efficacy may result in part from variance in teachers' emotions". Chan (2004) found that "self-efficacy beliefs were significantly predicted by the components of emotional intelligence" and suggested that differences between teachers might affect this relationship. Previous research, although limited, has focused on "emotions as a consequence rather than an antecedent" of efficacy beliefs (Sutton and Wheatley, 2003). Emmer and Hickman (1991) recommended research to explore the relationship between teacher emotions and efficacy beliefs.

There are several reasons to understand emotional intelligence and personality together. Emotional intelligence is a part of human personality, and personality provides the context in which emotional intelligence operates. Understanding emotional intelligence as a part of the broader personality system also can alert researchers as to what parts of personality may influence emotional intelligence, increase its effects, or lower them.

Despite the many reports on the relationships between self-efficacy, personality to emotional intelligence, there is scarce if any documentation of the influence of self-efficacy, personality and their interactive effect on emotional intelligence which will address

differences in teachers based on self-efficacy and personality. Keeping this in view the present study was planned.

The study was conducted on female teachers belonging to age group 35-50, having experience more than five years in the light of reported gender differences, age differences in emotional intelligence in some studies (Amirtha and Kadheravan, 2006; Katyal and Awasthi, 2005; Tapia and Marsh,2001).

The study deals specifically with secondary school teachers. Secondary education is an important subsector of the entire education system because it is the most crucial stage of life. Secondary school teachers require high level of emotional competency due to demanding situation, while dealing with adolescent children who suffer from swing moods and emotional instability. Therefore, it was essential to investigate level of emotional intelligence of secondary teachers. Research review says that emotional competence is related to the demonstration of self-efficacy in emotion eliciting social interactions (Saarni, 1997). But whether self-efficacy can be viewed as a means of enhancing emotional intelligence? Whether emotional regulation and management is affected by personality type? Keeping the above background in view the present study was taken up with the following objectives.

Objectives

1. To study the level of emotional intelligence of secondary school teachers.
2. To study the influence of occupational self-efficacy, personality and their interaction on emotional intelligence of secondary school teachers.

Methodology

Sample

A study was conducted on 240 female teachers (35-50 year old) teaching Class VII- IX having a teaching experience of >5 years who were randomly selected from various secondary schools of state Haryana.

Tools Used

1. Teachers' Emotional intelligence Inventory (tEQi) by Shubra Mangal

   The tEQi consists of 200 items measuring four factors of emotional intelligence i.e. Awareness of self and others (AOS),

Professional orientation (PO), Intrapersonal management (INTRA M), and Interpersonal management (INTER M).
The test-retest and split-half reliability coefficient of the scale was found to be .96 and 0.95 respectively. Construct and criterion validity of the scale were established.

2. *Occupational Self-Efficacy (OSE) Scale by SanjayPethe, Sushma Chaudhary and Upender Dhar*
The scale consists of 19 items identifying six factors of self-efficacy i.e. Confidence (C), Command (CO), Adaptability (A), Personal effectiveness (PE), Positive attitude (PA) and Individuality (I).
The odd-even reliability coefficient of the scale was found to be 0.98. Face and content validity of the scale were established.
3. *Introversion-Extroversion Inventory (IEI)* by *Dr. P.F. Aziz and Dr. Rekha Agnihotry*.
The inventory consists of 60 items – 30 pertaining to an introvert's characteristics and 30 to an extrovert's characteristics.
The test-retest reliability coefficient of the inventory was found to be 0.95. The criterion related validity coefficient was found to be 0.95.

Method

The present study is an ex-post facto type in which descriptive survey method has been used.

Data Collection

The State Haryana was divided into four zones viz. North, East, South and West. Then using lottery method one district was selected from each zone. A list of secondary schools located in these four districts was obtained from office of the concerned district education officer. Out of that list 20 schools (five from each district) were randomly selected for collection of data. The investigators personally visited the schools one by one. A list of all regular female teachers teaching Class VII-IX with experience above 5 years, ranging in age 35 to 50 years was prepared with the help of headmaster/headmistress of the concerned school. After rapport formation investigators administered the tools to all those listed teachers present on the day. Initially, 450 secondary teachers of Haryana State were chosen. Out of this, the responses of only 290 teachers could be taken for analysis, as only two levels in case of independent variables (High or low in case of occupational self-efficacy and introversion or extroversion in case of personality) were taken into consideration. Then, the extrovert and

introvert teachers were divided into two parallel groups- extroverts having high occupational self-efficacy, extroverts having low occupational self-efficacy, introverts having high occupational self-efficacy and introverts having low occupational self-efficacy. From each of these groups, 60 teachers were selected randomly, that is 60 from each combination group. In this way final sample comprised of 240 teachers as given in the following Table 1:

Table1
Distribution of Sample of Secondary School Teachers (N=240)

	High Occupational Self- efficacy	Low Occupational Self-efficacy
Extroverts	60	60
Introverts	60	60

Statistical Techniques Employed

In order to study the influence of personality, self-efficacy and their interaction on emotional intelligence 2-way ANOVA (2x 2 bivariate factorial designs) was employed. The first independent variable occupational self-efficacy (A) varied in two ways- High (A_1) and Low (A_2); the second independent variable personality (B) varied in two ways-Extrovert (B_1) and Introvert (B_2). In case of significant main effects as well as interactions, the ANOVA was supplemented by t-test.

Analysis and Interpretation of Data

In pursuance of the objectives data was analysed and interpreted under the following heads (1-2):

1. Level of emotional intelligence of secondary school teachers

Table 2
Classification of Subjects into Three Groups on the Basis of their Score in Emotional Intelligence Inventory (N=240)

Emotional intelligence Dimensions	High Level		Moderate Level		Low Level		N
	N	%age	N	%age	N	%age	
Awareness of Self and Others	32	13.33%	172	71.67%	36	15%	240
Professional Orientation	35	14.58%	168	70%	37	15.42%	240

Intrapersonal Management	36	15%	164	68.33%	40	16.67%	240
Interpersonal Management	38	15.83%	162	67.5%	40	16.67%	240
Total Emotional Intelligence	39	16.25%	160	66.67%	41	17.08%	240

The inferences regarding percentage of subjects falling into different dimensions of emotional intelligence are revealed in figure 1 also.

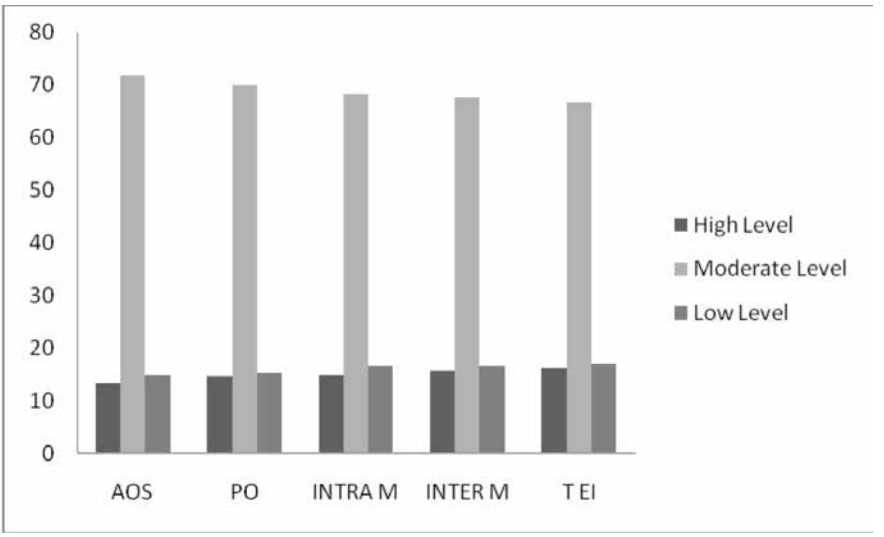

Fig.1: *AOS-Awareness of self and others, PO-Professional Orientation, INTRA PM- Intrapersonal management, INTER PM- Interpersonal management, T EI- Total Emotional intelligence*

2. Influence of occupational self-efficacy and personality on emotional intelligence of secondary school teachers

The summary of ANOVA (2x2x2) is given in Table 3.

Table 3
Summary of 2x2 Factorial Design ANOVA of Emotional Intelligence (N=240)

	df	Sum of Squares					Mean squares					F- value				
		Emotional Intelligence Dimensions					Emotional Intelligence Dimensions					Emotional Intelligence Dimensions				
		AOS	PO	INTRA M	INTER M	T EI	AOS	PO	INTRA M	INTER M	T EI	AOS	PO	INTRA M	INTER M	T EI
A	1	1653.12	406.13	202.51	1018.13	11438.28	1653.12	406.13	202.51	1018.13	11438.28	18.36*	14.87*	22.08*	10.86*	64.96*
B	1	4584.03	3444.5	962.51	5791.57	54532.53	4584.03	3444.5	962.51	5791.57	54532.53	50.91*	126.08*	104.96*	61.79*	309.69*
A x B	1	140.28	3.78	96.26	5644.7	.0025	140.28	3.78	96.26	5644.7	.0025	1.56 (NS)	0.14 (NS)	0.78 (NS)	60.23*	.000014 (NS)
Within SS	236	11164.6	3387.06	1136.47	11621.91	21834.69	90.0370	27.32	9.17	93.73	176.09					
Total	239	17542.03	7241.47	2397.75	24076.31	87805.50										

** Significant at .01 level, NS-not significant even at .05 level*

A-Occupational self-efficacy, B-Personality, AOS-Awareness of self and others, PO-Professional orientation, INTRA PM- Intrapersonal management, INTER PM- Interpersonal management, T EI- Total emotional intelligence

2.1 Emotional intelligence by occupational self-efficacy

From Table 3 it can be seen that the F-value for occupational self-efficacy with respect to AOS, PO, INTRA M, INTER M and T EI is 18.36, 14.87, 22.08, 10.86 and 120.96 respectively, which is significant at 0.01 with df=1/236. It means occupational self-efficacy had significantly independent effect upon AOS, PO, INTRA M, INTER M and T EI of secondary school teachers.

The mean profiles of teachers having high and low occupational self-efficacy level on dimensions of emotional intelligence have been plotted in Figure 2.

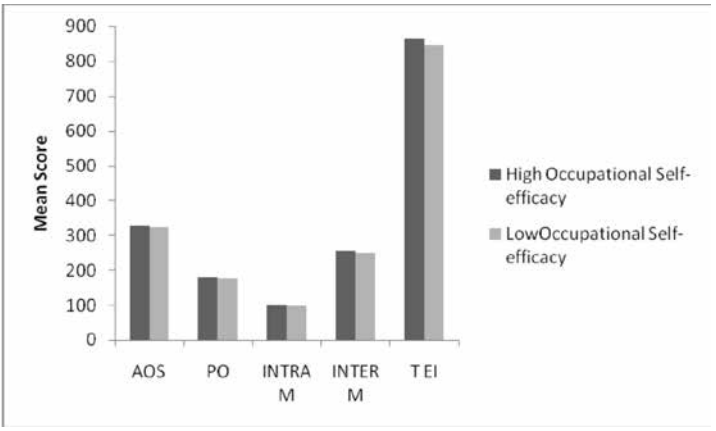

Fig. 2: *AOS-Awareness of self and others, PO-Professional Orientation, INTRA PM- Intrapersonal management, INTER PM- Interpersonal management, T EI- Total Emotional intelligence*

In order to interpret these mean values, t-test was applied. The results for the same have been given Table 4.

Table4

Occupational Self-efficacy Wise Mean, SD and t-value of Emotional Intelligence

EI dimensions	Group	N	Mean	SD	t-value	Remark
AOS	A1 A2	120 120	329.50 322.31	9.51 7.92	6.36	p<.01
PO	A1 A2	120 120	179.12 176.08	7.38 7.36	3.74	p<.01
INTRA M	A1 A2	120 120	100.63 98.11	3.97 4.37	4.68	p<.01
INTER M	A1 A2	120 120	256.38 250.73	12.59 10.86	3.72	p<.01

T EI	A1 A2	120 120	866.14 847.23	24.36 24.88	5.95	p<.01

AOS-Awareness of self and others, PO-Professional Orientation, INTRA PM- Intrapersonal management, INTER PM- Interpersonal management, T EI- Total Emotional intelligence

From Table 4 it is clearly evident that secondary school teachers of different occupational self-efficacy levels differed significantly at .01 level in all the dimensions of emotional intelligence i.e AOS,PO,INTRA M, INTER M and in their T EI score which favored teachers with high occupational self-efficacy to score more when compared to teachers with low occupational self –efficacy.

2.2 Emotional intelligence by personality

From Table 3 it can be seen that the F-value for personality is 50.91 which is significant at 0.01 with df =1/236. It shows personality significantly influenced the emotional intelligence of secondary school teachers. The mean profiles of extrovert and introvert teachers on dimensions of emotional intelligence have been plotted in Figure 3.

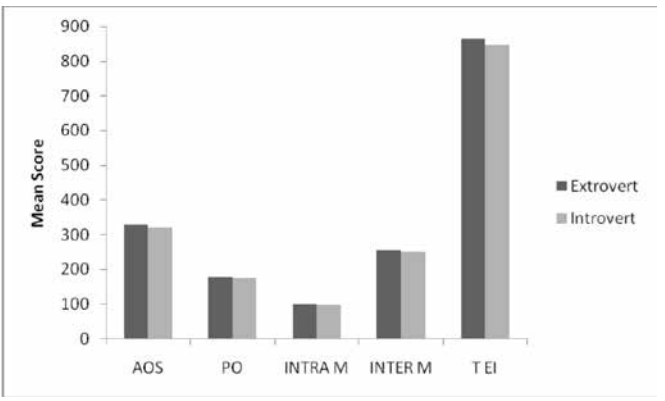

Fig. 3: *AOS-Awareness of self and others, PO-Professional Orientation, INTRA PM- Intrapersonal management, INTER PM- Interpersonal management, T EI- Total Emotional intelligence*

In order to interpret these mean scores, t-test was applied. The results for the same have been given in Table 5.

Table 5

Personality wise Mean, SD and t-value of Emotional Intelligence

EI dimensions	Group	N	Mean	SD	t-value	Remark
AOS	B1 B2	120 120	331.89 319.92	8.23 6.24	12.70	p<.01

PO	B1 B2	120 120	183.05 172.67	4.47 6.34	14.66	p<.01
INTRA M	B1 B2	120 120	102.11 96.63	2.70 3.93	12.59	p<.01
INTER M	B1 B2	120 120	260.28 246.83	11.39 8.42	10.41	p<.01
TEI	B1 B2	120 120	877.33 836.05	15.67 16.81	5.95	p<.01

AOS-Awareness of self and others, PO-Professional orientation, INTRA PM- Intrapersonal management, INTER PM- Interpersonal management, TEI- Total emotional intelligence

From Table 5 it is clearly evident that extrovert and introvert secondary school teachers differed significantly at .01 level in all the dimensions of emotional intelligence i.e. AOS, PO, INTRA M, INTER M and in their T EI score, which favoured extrovert teachers to score more when compared to introvert teachers.

2.3 Interaction effect on emotional intelligence

F-value for the interaction between occupational self-efficacy and personality (A x B) with respect to INTER M is 45.79 (vide Table 3 for df= 1/236) is significant at .01 level, leading to inference that the two variables interact with each other.

The interaction effect between occupational self-efficacy and personality has been shown graphically in Figure 4.

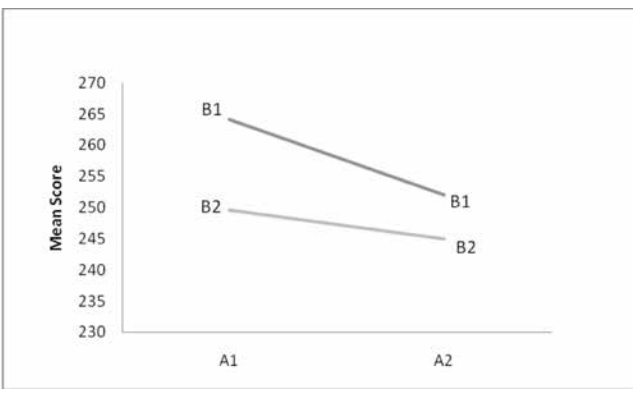

Fig. 4: *A1: High Occupational Self-efficacy, A2: Low Occupational Self-efficacy, B1: Extrovert, B2: Introvert*

The non-parallel lines in Figure 4 show the presence of interaction is significant. To investigate further, the interaction between occupational self-efficacy and personality, the t-ratios were computed. The results for the same have been given in Table 6.

Table 6

Significance of Difference of Mean Scores of Interpersonal Management Skill (INTER M) of Different Combination Groups for Occupational Self-efficacy x Personality

Group (Mean)	A1B1 (264.09)	A1B2 (249.66)	A2B1 (252)	A2B2 (245)
A1B1 (264.09)	-	5.02*	2.02 **	7.31*
A1B(249.66)	-	-	3.53*	2.84*
A2B1(252)	-	-	-	6.31*
A2B2(245)	-	-	-	-

**.01 level of significance, **.05 level of significance, A1 –high occupational self-efficacy, A2 –low occupational self-efficacy, B1 –extrovert, B2- introvert*

Table 6 shows that

- Extrovert teachers having high occupational self-efficacy level have more interpersonal management skills (M=264.09) than introvert teachers having high occupational self-efficacy level (M=249.66).
- Extrovert teachers having high occupational self-efficacy scores have more interpersonal management skills (M=264.09) as compared to extrovert teachers having low occupational self-efficacy (M=252).
- Extrovert teachers having high occupational self-efficacy level have more interpersonal management skills (M=264.09) than introvert teachers having low occupational self-efficacy level (M=245).
- Extrovert teachers having low occupational self-efficacy level have more interpersonal management skills (M=252) than introvert teachers having high occupational self-efficacy level (M=249.66).
- Introvert teachers having high occupational self-efficacy level have more interpersonal management skills (M=249.66) than introvert teachers having low occupational self-efficacy level (M=245).
- Extrovert teachers having low occupational self-efficacy level have more interpersonal management skills (M=252) than introvert teachers having low occupational self-efficacy level (M=245).

Table 6 also shows that extrovert teachers having high occupational self-efficacy level have maximum interpersonal management scores (M=264.09), while introvert teachers having low occupational self-efficacy level have minimum interpersonal management scores (M=245). Figure 4 also supports the same interpretation.

Findings of the Study

1. There exists significant difference in emotional intelligence of secondary school teachers with respect to occupational self-efficacy.
2. There exists significant difference in emotional intelligence of secondary school teachers with respect to personality.
3. There exists significant influence of occupational self-efficacy and personality on interpersonal management skill of secondary school teachers.

Discussion of the Findings

The discussion is presented under the three subheads:

Emotional intelligence and occupational self-efficacy

From the results it is clearly evident that emotional intelligence is significantly more in case of secondary school teachers having high occupational self-efficacy in comparison to secondary school teachers having low occupational self- efficacy. The results are in consonance with the findings of Sailaja and Uma Devi (2010) who reported significant differences between the emotional intelligence of adolescents with different self-efficacy levels favouring adolescents with high self-efficacy to score better than medium and low self-efficacy levels on all dimensions of emotional intelligence.

The results reveal that secondary school teachers with high occupational self-efficacy level are comparatively more professionally oriented and are more aware of self and others.This may be due to the reason that teachers with high level of self-efficacy are better skilled in art of doing work efficiently, which make them more predictive about the possible problems and issues faced during the work carried out by their colleagues. This way they develop the ability to monitor feelings from moment to moment. Interestingly, present results are similar with the findings revealed by Phillips and Gully (1997) where under graduates with high self-efficacy levels were found to set goals by themselves, better performance in the examinations with

high goal orientation and with internal locus of control. Coladarci (1992) and Evans and Tribble (1986) observed higher professional commitment for efficacious in-service and pre-service teachers respectively. This also indicates a probable correlation between professional commitment and profession orientation which may be verified in a further study.

Results also indicate that secondary school teachers with high occupational self-efficacy are higher on skills of intrapersonal and interpersonal management than teachers with low occupational self-efficacy. Self-efficacy positively influence the ability to express feelings and convey ideas with confidence. Teachers with high self-efficacy being more empathetic establish relationships and are more socially responsible. It is interesting to note that Saarni (1997) in a study found that self-efficacy and social interactions are central to emotional competent functioning of individuals.

Emotional intelligence and personality

It is apparent from the results that emotional intelligence is significantly more in case of extrovert secondary school teachers as compared to introvert secondary school teachers. The study supports the findings of H.S. and Betsur (2010) that extroverts are more emotionally intelligent.

The results reveal that extrovert secondary school teachers are more professionally oriented and more aware of self and others than introverts. It may be because of their continuous interaction that allows them to understand the feelings of others and they respond to it frequently. While discussing and interacting with people they become more aware of career prospects, existing and coming opportunities for growth and advancement of their careers. Introverts derive the information from secondary sources only, rarely engaging themselves with primary sources of information. The observation is supported by the research work of Khanwelier on introverted professionals. According to introverts, extroverts are more likely to excel in their workplace (Kahnweiler, 2009).

Results also indicate that extrovert teachers are higher on intrapersonal as well as on interpersonal management skill. This may be attributed to the reason that extroverts express their feeling in a better way and have comparatively more confidence to convey their ideas. They are oriented outside, for surroundings and are more capable of building bonds and taking initiatives. Also because of their more interaction with people they withstand adverse events

and stressful situations and have better opportunities to manage others effectively as compared to their counterparts.

Interactional effect of occupational self-efficacy and personality on emotional intelligence

Regarding interactional effect, the joint effect of factors occupational self-efficacy and personality is found significant on dimension interpersonal management skill. The probable reason for significant interaction effect may be due to the two different ways in which each factor is varying viz. high and low occupational self-efficacy level; and extrovert and introvert teachers.

Educational Implications

1. Since emotionally intelligent teachers are more likely to succeed in classroom. In schools efforts should be made to develop in teachers the appropriate level of emotional intelligence. In this context special attention should be given to teachers having low level of emotional intelligence. Emotional intelligence may be developed through emotional competences (Goleman 1998; Steiner 1997; Höpfl and Linstead 1997; Cooper and Sawaf 1997; Martinez 1997). Thus, high quality programmes can bear significant influence on the development of emotional competences in the desired direction.
2. Since pre-service teacher training (B.Ed.) is mandatory for secondary school teacher, so it is imperative for colleges of education to integrate emotional competencies within the objectives of pre-service training keeping in view the basic content and competency objectives, which future teachers are to develop in their students. Training in emotional competencies for prospective teachers will enable them to make a worthy response to the multiciplicity of functions and educational demands.
3. Extrovert teachers are more emotionally intelligent as compared to introvert teachers. Therefore, we can attain optimum success in training needed competences if we take into consideration the personality type (introvert/extrovert) of teacher.
4. Since occupational self-efficacy has produced independent significant contribution to all dimensions of emotional intelligence and overall emotional intelligence. It is possible that enhancing teachers' self-efficacy will have a positive influence on their emotional intelligence. Hence, teachers must be trained to further enhance their self-efficacy levels which include cognitive,

motivational, and affective and selection processes to reach favourable levels of emotional intelligence throughout their life span. Thus, it is important to find ways to enhance self-efficacy of teachers.

Natesan (2004) reported that Positive Therapy (a package, combining the eastern techniques of Yoga and western techniques of Cognitive Behaviour Therapy) can enhance self- efficacy. Rajakumari and Natesan (2010) concluded from study on150 adolescents that after the Positive Therapy, there was a significant enhancement in the level of general self-efficacy from low to moderate in Assessment ll to high in Assessment lll, indicating the beneficial effects of Positive Therapy in the enhancement of general self-efficacy. So, Positive Therapy can be practised over secondary school teacher, especially having low self-efficacy level.

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Impact of Learning Approaches on Achievement of Pupil Teachers in Relation to their Academic Streams at Different Levels of Intelligence

DR MEENA*

ABSTRACT

The present study was an effort to examine how interaction between Learning Approaches (DA/SA) and Academic Streams (Arts/Science) affected the academic learning outcomes of 200 pupil teachers at their different levels of intelligence i.e., high, average and low. The obtained data was analysed with the help of 2-way ANOVA. The major findings of the study were: (i) Pupil teachers under Arts and Science group yielded significant differences in mean scores at average level of intelligence. (ii) Academic streams (Arts/Science) and Learning Approaches (DA/SA) interacted significantly with regard to mean scores at average and low level of intelligence.

Much literature is now available on the ***learning approaches*** where the crucial juncture is that student follows numerous ways or strategies of learning as per his need or as the situation demands from him. The work done by Marton and Saljo (1976); Marton, Prosser and Trigwell (1991); Biggs (1999) reflected the number of approaches to learning like deep approach, surface approach, achievement approach, strategic approach, vocational approach, etc. However, Marton and Saljo (1976) identified two levels of processing that were considered significant in the domain of students' learning: ***deep*** and ***surface***.

The experiment conducted by the **Marton and Saljo (1976)** established two major categories i.e. *deep* and *surface,* which were used in the present study to describe the ***learning approaches*** of students for specific academic tasks. *Deep Approach* of learning means when the students try to understand the whole picture, and try to comprehend and understand the academic work. *Surface Approach* of learning on the other hand means when students

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try to remember facts without considering its in-depth knowledge and understanding.

Students definitely follow a particular learning approach that further led to differences in their scholastic proficiencies or academic achievement. Generally, it is assumed that those students who have indepth knowledge of the subject exhibit commendable performances in their discipline. Different subjects, disciplines, streams or learning tasks also force students to select or follow a particular strategy or approach for learning the content matter. Whatever be the domains of cognitive, affective and psychomotor objectives of the academic stream, it influences directly or indirectly the students' learning approach in a great deal. Students are segregated and the best (read those securing higher percentage) walk away with the honour and privilege of studying exalted science subjects (Singh, 2009).

The role, which different academic streams play with the students' learning approaches and their achievement, cannot be overruled. The present study comprises academic streams of Arts and Science. The reason behind choosing arts vs. science was the prevalent norm that assumes science stream requires more efforts from students while arts stream requires less hardwork. In the present study, B.Ed. pupil teachers who obtained their academic degrees i.e. M.A. (Master of Arts); B.A. (Bachelor of Arts) were considered under the ***Arts Group*** while the others who obtained their academic degrees i.e. M.Sc. (Master of Science); B.Sc. (Bachelor of Science) were considered under the ***Science Group***.

Another variable undertaken in the study was ***intelligence***. In general, intelligence is the ability to learn from experiences to deal with new situations. The performance of any task systematically and without any interruptions is considered as a symbol of intelligence. Empirical and scientific investigations also tend to support the widely held view that intellectual capacity of an individual plays an important role in determining the limits of his academic achievement (Hollingworth and Cobb, 1923; Freeman, 1992; Crawford and Burnham, 1946; Gowan, 1955; Vernon, 1970).

Entwistle and Entwistle (1970), Entwistle and Brennan (1971), Pask (1976) and Ramsden and Entwistle (1981) espoused the viewpoint that one of the explanations of discrepant academic achievement lies in learning styles of the students. Cultivating poor style of learning inhibits learning and therefore, may be detrimental to scholastic attainment.

The teacher by identifying the learning style and intelligence level of each student can use this information in grouping the students; motivating the students; selecting appropriate teaching methods; designing curriculum; finding the difficulty level of the discipline and so on so that each of his or her students may get education according to his or her unique style.

Theoretical Perspective

While the description of the two approaches to learning were formulated through research based on finding meaning in text, it is useful to observe how this phenomena helped other researchers. Ramsden and Entwistle's (1981) investigation resulted that positive attitude to study combined with high scores lead to deep approach and with low scores, it lead to surface approach. Van Rossum and Schenk (1984) found that students who used a surface approach to learning held reproductive conception of learning (increasing one's knowledge, memorising and reproducing and applying), whereas those who used a deep approach held a constructive conception (understanding and seeing something in a different way).

The purpose of the study conducted by Avery, R.E. (1986) concluded that matching learning styles with teachers' styles did not improve academic achievement and that teachers could not guess the dominant styles of their students. Thummarpon, A. (1988) indicated that learning style variable labeled expectation for success was the best predictor of academic success as measured by GPA (Grade Point Average). Steven, J.(1989). Reported significant differences in learning style preferences between gifted and non-gifted students regardless of grade level (elementary vs. junior high), type of giftedness (academically talented vs. intellectually gifted) and geographic locale (urban vs. sub urban). Kember et al (1999) observed that there was wide spread support for a deep approach by lecturers and teachers and this was frequently noted as a goal of education.

The findings of the study by Siliauskas - Waker, were that learners characterised as *deep* may be able to assimilate different deep strategies without ill effect, while learners categorised as *surface* may require other interventions if they are to develop understanding. A study done by Lindsey and Faulkner (1996) highlighted a significant association between combinations of learning goals, the types of strategies students use and the levels of school achievement. Salim Kumar, C.'s (1999) study concluded

that there is no impact of approaches to studying and achievement motivation on achievement in Biology for high, low or average intelligence group.

Wannasilapa, U. (2003) in her study led to a conclusion that learning approaches do not seem to affect differently the attainments of students. Hall, Ramsay and Raven (2004) in their research paper indicated that students' of accounting exhibited a small but statistically significant increase in their deep learning approach, and a small but statistically significant reduction in their surface learning approach. Meena (2006) in her study concluded that students with deep and surface learning approaches do not have any significant differences for skill of acquiring knowledge, skill of decision-making and communication skill, but for the skill of critical thinking the results were significant.

Yuan, Rong's (2006) maintained that the surface and apathetic approach was a significant predictor for both learners' measured language proficiency and their self – perception of academic performance. The strategic approach was a positive predictor for learner's attitude towards Technology Enhanced Language Learning (TELL); whereas, surface and apathetic approach was a negative predictor for learners' language proficiency or their attitude towards TELL. Singh, B. (2008) in his study reported that pupil teachers under Arts and Science group with deep and surface learning approaches do not have significant results at high, average and low level of intelligence.

Rationale of the Study

The present study emphasised the delicate balance needed by the pupil teachers' to make the qualitative differences in students' learning along with the quantitative improvement in learning outcomes. While reviewing the related literature on learning approaches and intelligence, it has been found that the students of high intelligence generally follow the learning task very deeply, which is somewhat related to *deep approach of learning*. On the contrary, the students who are less intelligent follow the superficial approach towards the learning tasks. Besides this, the present study also assumed that somehow the different academic streams or courses adopted by the students also reflect their hidden choice towards learning task. Therefore, there is a linkage factor between *learning approaches*, which the students adopt, *intelligence level*, which they possess, and *academic streams/courses*, which they opt.

Students' learning approach – deep or surface does not represent their level of intelligence or the reason why they have chosen a particular academic stream. However, it represents a relationship between the student and what he or she is trying to grasp with the natural endowments he has been provided and the course of education he has opted.

Objectives of the Study

- To compare the achievement scores of pupil teachers of Arts and Science group at different levels of intelligence.
- To study the Learning Approaches of pupil teachers at different levels of intelligence.
- To study the interaction effect of Learning Approaches (DA/SA) and Academic Streams (Arts/Science) of pupil teachers at different levels of intelligence.

Hypotheses

- Arts and Science group will yield equal level of mean scores of achievement at different levels of intelligence, viz. high, average and low.
- Two learning approaches: Deep and Surface (DA/SA) will result in equal levels of means at different levels of intelligence**,** viz. high, average and low.
- Academic Streams (Arts/Science) and Learning Approaches (DA/SA) do not interact with each other to yield significantly different mean scores at different levels of intelligence, viz. high, average and low.

Delimitations of the study

The present study has been delimited as:

- The study was confined to the pupil teachers of Government College of Education, Chandigarh.
- The investigator for the present study chose only pupil teachers of Arts and Science groups.

Tools used

The following tools were used for collecting the data:

- Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) by Biggs, J. B. et al (2001). The questionnaire has two main scales: Deep Approach (DA) and Surface Approach (SA) with four subscales: - Deep Motive (DM), Deep Strategy (DS), Surface Motive (SM) and Surface Strategy (SS). Each of the main scale

consists of 10 items. The questionnaire used a 5-point Likert scale. The Cronbach values of the questionnaire are 0.73 for DA and 0.64 for SA, which are considered as acceptable.

- General Group Mental Ability Test prepared by Jalota (1976) consists of 100 questions and is meant for the age group of 20-52. The total score can be interpreted on 11-point C-scale or a 7-point Intelligence Grading. A useful I. Q. Reckoner is also provided for the range of 60 to 140. The reliability of the test ranges from 0.75 to 0.85 (Singh, 2008).
- Based on the obtained scores of intelligence test the pupil teachers in the Arts and Science group were classified at the three levels of intelligence viz. high, average and low. The different levels of intelligence as per Kelly's (1939) method were formed as follows:
- All the pupil teachers scoring sheets were arranged in the descending order based on total scores obtained.
- The first 27 per cent cases formed the group of Intelligence at High Level (IH) and the last 27 per cent cases formed the lower group, that is, Intelligence at Low Level (IL).
- The remaining 46 per cent cases comprised the group of Intelligence at Average Level (IA).

Sample

The stratified sampling employed to select the pupil teachers from the Arts and Science groups. The structure of the final sample for Arts and Science groups of pupil teachers comprised of N=200 based on Deep and Surface learning approach has been given in Table 1.

Table 1

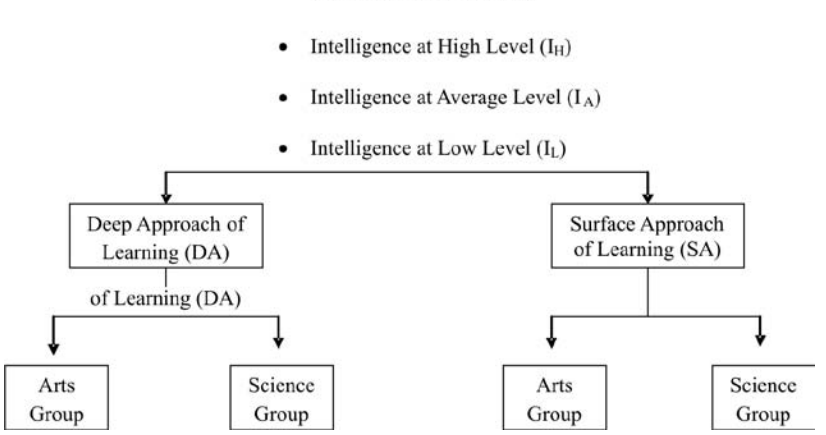
Categorisation of the Final Sample according to Deep and Surface Approach to Learning at Different Levels of Intelligence

S. No.	Groups	High level of Intelligence		Average level of Intelligence		Low level of Intelligence		Total
		DA	SA	DA	SA	DA	SA	
1.	Arts	15	22	28	14	9	19	107
2.	Science	15	14	21	27	9	7	93
	Total	30	36	49	41	18	26	200

Design of the study

The present study employed a 2x2 factorial design where Learning Approaches (DA/SA) and Academic Streams (Arts/Science) of pupil

teachers were independent variables, whereas the achievement scores at the different levels of intelligence was dependent variable. The schematic layout of the design has been given in Figure 1.



Procedure of the Study

The first tool, the questionnaire of Revised Two Factor Study Process was administrated to identify pupil teachers of Deep and Surface Learning Approach. Scores of Jalota's intelligence test was found out and on this basis, the level of intelligence i.e., high, average and low were determined. The final achievement scores of all the students were obtained from the results of the final examination of B.Ed. conducted by Panjab University, Chandigarh in year 2008. Finally, these pupil teachers were divided into two groups (Arts/Science) as per their academic stream. All the tools were scored according to their prescribed scoring keys and the data thus obtained was subjected to statistical analyses.

Statistical Techniques

The following statistical techniques were used to test the various hypotheses based on the objectives of the study:

- Mean and standard deviations were used
- Two-way ANOVA on achievement scores of the students at different levels of intelligence i.e. high, average and low

Analysis and Description of Data

The means and SD's of different groups at different levels of intelligence have been shown in Table 2 and Table 7 (detailed version).

Table 2

Means and SD's of Achievement Scores of Arts and Science Group at Different Levels of Intelligence

Levels of Intelligence	Arts Group	Science Group
I_H	Mean = 792.97 S.D.= 43.48 N=37	Mean = 781.62 S.D.= 29.39 N=29
I_A	Mean = 777.94 S.D.= 32.92 N=42	Mean = 763.2 S.D.= 22.97 N=48
I_L	Mean = 755.17 S.D.= 34.49 N=28	Mean = 776.81 S.D.= 38.77 N=16

The present study employed a 2x2 factorial design so that two independent variables can be evaluated along with the dependent variable. The data was analysed according to the specifications of Winer (1971) and Broota (1989) on ANOVA. The obtained achievement scores of pupil teachers of both Arts and Science groups were tabulated and subjected to two-way analysis of variance. The nomenclature of formulae and procedure used for 2 x 2 ANOVA on achievement scores at high, average and low level of intelligence has been given in the Table 3, 4 and 5 respectively.

Table 3

Nomenclature procedure and formulae for 2x2 ANOVA on Achievement Scores at High Level of Intelligence

	Deep Approach	Surface Approach	Total
Arts Group	$T_1=11725$ $N_1=15$ $\frac{T_1^2}{N_1}=9165041.66$ $Xij^2=9200389$	$T_2=17615$ $N_2=22$ $\frac{T_2^2}{N_2}=14104010.22$ $Xij^2=14135393$	$T_e=29340$ $N_e=37$ $\frac{T_e^2}{N_e}=23265827.027$ $Xij^2=23335782$
Science Group	$T_3=11919$ $N_3=15$ $\frac{T_3^2}{N_3}=9470837.4$ $Xij^2=9484719$	$T_4=11198$ $N_4=14$ $\frac{T_4^2}{N_4}=8956800.28$ $Xij^2=8960790$	$T_c=23117$ $N_c=29$ $\frac{T_c^2}{N_c}=18427437.55$ $Xij^2=18445509$
Total	$T_1+T_3=23644$ $N_1+N_2=30$ $\frac{(T_1+T_3)^2}{N_1+N_3}=18634624.53$ $Xij^2=18685108$	$T_2+T_4=28813$ $N_2+N_4=36$ $\frac{(T_2+T_4)^2}{N_2+N_4}=23060804.69$ $Xij^2=23096183$	$T_T=52457$ $N_T=66$ $\frac{T_T^2}{N_T}=41692982.56$ $Xij^2_{(1)+(2)+(3)+(4)}=41781291$

TABLE 4

Nomenclature Procedure and Formulae for 2x2 ANOVA on Achievement Scores at Average Level of Intelligence

	Deep Approach (DA)	Surface Approach (SA)	Total
Arts Group	$T_1=21551$ $N_1=28$ $\frac{T_1^2}{N_1}=16587342.89$ $Xij^2=16617699$	$T_2=11123$ $N_2=14$ $\frac{T_2^2}{N_2}=8837223.5$ $Xij^2=8850665$	$T_e=32674$ $N_e=42$ $\frac{T_e^2}{N_e}=25418816.09$ $Xij^2=25468364$
Science Group	$T_3=16024$ $N_3=21$ $\frac{T_3^2}{N_3}=12227075.04$ $Xij^2=12239558$	$T_4=20610$ $N_4=27$ $\frac{T_4^2}{N_4}=15732300$ $Xij^2=15763500$	$T_c=36634$ $N_c=48$ $\frac{T_c^2}{N_c}=27959374.08$ $Xij^2=28003058$
Total	$T_1+T_3=37575$ $N_1+N_2=49$ $\frac{(T_1+T_3)^2}{N_1+N_3}=28813890.3$ $Xij^2=28857257$	$T_2+T_4=31733$ $N_2+N_4=41$ $\frac{(T_2+T_4)^2}{N_2+N_4}=24560568.02$ $Xij^2=24614165$	$T_T=69308$ $N_T=90$ $\frac{T_T^2}{N_T}=53373320.71$ $Xij^2_{(1)+(2)+(3)+(4)}=53471422$

Table 5

Nomenclature Procedure and Formulae for 2x2 ANOVA on Achievement Scores at Low Level of Intelligence

	Deep Approach (DA)	Surface Approach (SA)	Total
Arts Group	$T_1=6874$ $N_1=9$ $\frac{T_1^2}{N_1}=5250208.44$ $Xij^2=5251470$	$T_2=14271$ $N_2=19$ $\frac{T_2^2}{N_2}=10719023.2$ $Xij^2=10750097$	$T_e=21145$ $N_e=28$ $\frac{T_e^2}{N_e}=15968250.89$ $Xij^2=16001567$
Science Group	$T_3=6819$ $N_3=9$ $\frac{T_3^2}{N_3}=5166529$ $Xij^2=5169575$	$T_4=5610$ $N_4=7$ $\frac{T_4^2}{N_4}=4496014.28$ $Xij^2=4509490$	$T_c=12429$ $N_c=16$ $\frac{T_c^2}{N_c}=9655002.56$ $Xij^2=9679065$
Total	$T_1+T_3=13693$ $N_1+N_2=18$ $\frac{(T_1+T_3)^2}{N_1+N_3}=10416569.38$ $Xij^2=10421045$	$T_2+T_4=19881$ $N_2+N_4=26$ $\frac{(T_2+T_4)^2}{N_2+N_4}=15202083.11$ $Xij^2=15259587$	$T_T=33574$ $N_T=44$ $\frac{T_T^2}{N_T}=25618488.09$ $Xij^2_{(1)+(2)+(3)+(4)}=25680632$

F- ratios were calculated to know whether the difference in the two groups were significant or not. The sum of squares, mean sum of squares, error term and F-ratios for main effects and interaction effect of the two variables at different levels of intelligence has been presented in the Table 6.

TABLE 6

Summary of Two-way Analysis of Variance on Mean Scores at Different Levels of Intelligence

Sources of Variation	Different Levels of Intelligence	Sum of Squares	df	Mean Sum of Squares	F-ratio
Main Effects: A Arts/Science	I_H I_A I_L	282.017 4869.46 4765.36	1 1 1	282.017 4869.46 4765.36	0.21 **4.78*** 3.90
Learning Approaches: B DA/SA	I_H I_A I_L	2446.66 1137.61 164.4	1 1 1	2446.66 1137.61 164.4	1.79 0.11 0.13
Interaction Effect (AxB)	I_H I_A I_L	978.323 4613.65 8357.07	1 1 1	978.323 4613.65 8357.07	0.72 **4.54*** **6.84***
Error Term	I_H I_A I_L	84601.44 87480.57 48857.08	62 86 40	1364.54 1017.21 1221.427	------ ------- ------
TOTAL	I_H I_A I_L	88308.44 98101.29 62143.91	65 89 43	----- ------ ------	------ ------ ------

** Significant at 0.05 level of significance*

MAIN EFFECT: A

Academic Streams (Arts and Science Group): F-ratio (Table No.6) for the differences in mean scores of two groups viz. Arts and Science was not found to be significant even at the 0.05 level of confidence at ***high*** and ***low*** level of intelligence. This suggests that the two groups opting two different academic streams yielded equal level of mean scores at ***high*** and ***low*** level of intelligence. However, at ***average*** level of intelligence, the difference in mean scores of two groups was found to be significant at 0.05 level of confidence.

MAIN EFFECT: B

Learning Approaches: **Deep and Surface Approach (DA/SA):** F-ratio (Table No.6) for the difference in mean scores of the groups

with Deep and Surface Approach (DA/SA) of learning was not found to be significant even at the 0.05 level of confidence. It concluded that the students with Deep and Surface learning approaches scored equal level of mean scores at ***high, average*** and ***low*** level of intelligence.

TWO ORDER INTERACTION EFFECT (A x B)

Academic Streams (A) and Learning Approaches (B): F-ratio (Table No.6) for the difference in mean scores at ***high*** level of intelligence for the interaction effect between instructional streams (Arts and Science) and Learning Approaches (DA and SA) was not found to be significant even at the 0.05 level of confidence. It concluded that the Instructional Streams and Learning Approaches operated independent of each other with regard to scores at ***high*** level of Intelligence. However, at ***average*** and ***low*** level of intelligence for the interaction effect between Academic Streams (Arts and Science) and Learning Approaches (DA and SA) found to be significant at 0.05 level of confidence. This indicates that differences were not due to chance factors. It concluded that the Academic Streams and Learning Approaches of pupil teachers were dependent on each other with regard to mean scores at average and low level of intelligence.

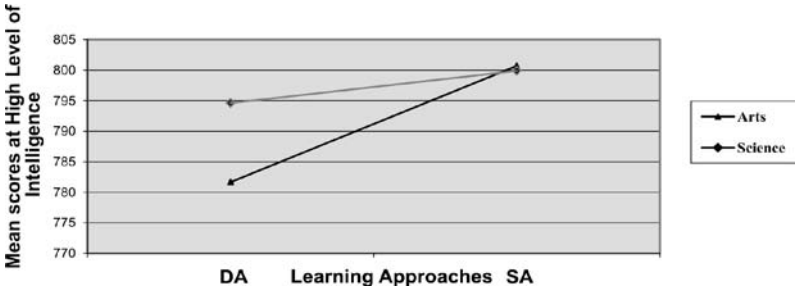


Fig. 2: *Interaction graph between academic stream (Arts/Science) and learning approaches (DA/SA) at high level of intelligence*

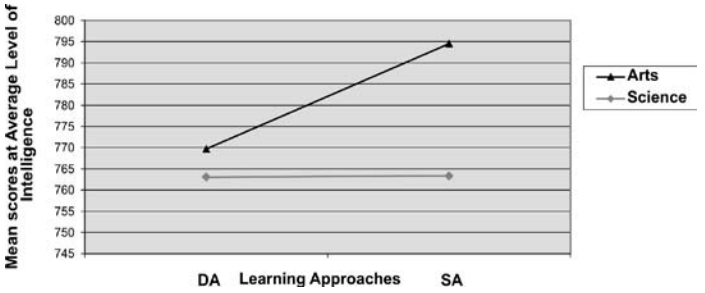


Fig. 3: *Interaction graph between academic streams (Arts/Science) and learning appraches (DA/SA) at average level of intelligence*

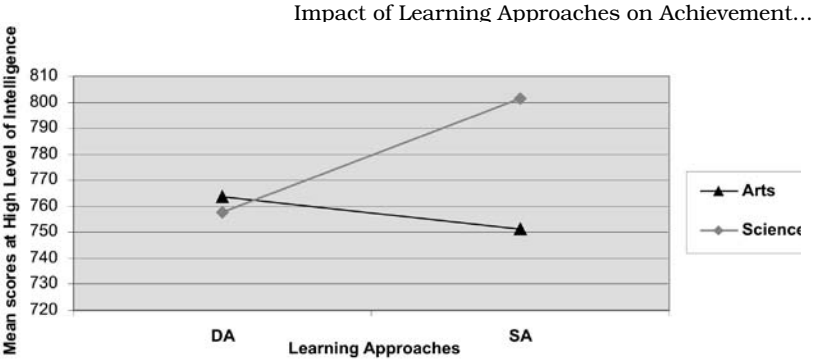


Fig. 4: Interaction graph between academic streams (Arts/Science) and learning appraches (DA/SA) at low level of intelligence

The line diagrams drawn to depict interaction effect (Fig. 2, 3 and 4) at different levels of intelligence led to decision to follow up, F-ratio for interaction effect, by the t-test to probe deeply into the observed results. The differences in the mean scores of students with the two learning approaches (DA and SA) for Arts and Science group were investigated separately with the help of t-ratios. The Mean, S.D.'s and t-ratios for the differences in means scores at different levels of intelligence recorded in Table 7.

TABLE 7

Different Combination Groups of Academic Streams and Learning Approaches at Different Levels of Intelligence

Different Levels of Intelligence	Interaction between Combination Groups	Means		S.D.		t-value
I_H	Arts/DA and Arts/SA	781.67	800.68	48.54	37.77	1.28
	Sci/DA and Sci/SA	794.6	799.86	30.42	16.88	0.58
	Arts/DA and Sci/DA	781.67	794.6	48.54	30.42	0.87
	Arts/SA and Sci/SA	800.68	799.86	37.77	16.88	0.08
	Arts/DA and Sci/SA	781.67	799.86	48.54	16.88	1.36
	Arts/SA and Sci/DA	800.68	794.6	37.77	30.42	0.54
I_A	Arts/DA and Arts/SA	769.67	794.5	36.71	12.01	**3.25***
	Sci/DA and Sci/SA	763.04	763.33	24.48	21.74	0.04
	Arts/DA and Sci/DA	769.67	763.04	36.71	24.48	0.75
	Arts/SA and Sci/SA	794.5	763.33	12.01	21.74	**5.91***
	Arts/DA and Sci/SA	769.67	763.33	36.71	21.74	**8.10***
	Arts/SA and Sci/DA	794.5	763.04	12.01	24.48	**5.04***
I_L	Arts/DA and Arts/SA	763.77	751.10	11.83	40.44	1.26
	Sci/DA and Sci/SA	757.66	801.42	18.39	43.87	**2.48***
	Arts/DA and Sci/DA	763.77	757.66	11.83	18.39	0.84
	Arts/SA and Sci/SA	751.10	801.42	40.44	43.87	**2.65***
	Arts/DA and Sci/SA	763.77	801.42	11.83	43.87	**2.21***
	Arts/SA and Sci/DA	751.10	757.66	40.44	18.39	0.59

** Significant at 0.05 level of significance*

Section I: At High Level of Intelligence

The following conclusions were drawn from the analyses of Table No. 7:

- Pupil teachers with Deep Approach of learning and those with Surface Approach of learning under Arts group failed to yield significant differences in mean scores at high level of intelligence (t = 1.28,not significant).
- Pupil teachers with Deep Approach of learning and those with Surface Approach of learning under Science group failed to yield significant differences in mean scores at high level of intelligence (t=0.58,not significant).
- With Deep Approach, Arts and Science group scored equal levels of mean scores at high level of intelligence (t = 0.87, not significant).
- With Surface Approach also, Arts and Science group scored equal levels of means at high level of intelligence (t = 0.08, not significant).
- For Deep Approach, pupil teachers of Arts group and Science group pupil teachers with Surface Approach scored equal levels of mean scores at high level of intelligence (t = 1.36,not significant).
- For Surface Approach also, pupil teachers of Arts group and Science group pupil teachers with Deep Approach scored equal levels of mean scores at high level of intelligence (t = 0.54, not significant).

Section II: At Average Level of Intelligence

The following conclusions were drawn from the analyses of Table No. 7:

- Pupil teachers with Deep Approach of learning and those with Surface Approach of learning under Arts group yielded significant differences in mean scores at average level of intelligence (t = 3.25, significant).
- Pupil teachers with Deep Approach of learning and those with Surface Approach of learning under Science group failed to yield significant differences in mean scores at average level of intelligence (t = 0.04, not significant).
- With Deep Approach, Arts and Science group scored equal levels of mean scores at average level of intelligence (t = 0.75, not significant).

- Pupil teachers following Surface Approach of learning scored higher means at average level of intelligence under Arts group as compared to those with SA under Science group (t = 5.91, significant).
- For Deep Approach, the mean scores of pupil teachers of Arts group were higher as compared to that of Science group pupil teachers with Surface Approach of learning at average level of intelligence (t= 8.10, significant).
- Pupil teachers with Surface Approach and studying under Arts group achieved higher means at average level of intelligence as compared to pupil teachers with Deep Approach of Science group (t= 5.04, significant).

Section III: At Low Level of Intelligence

The following conclusions were drawn from the analyses of Table No. 7:

- Pupil teachers with Deep Approach of learning and those with Surface Approach of learning under Arts group failed to yield significant differences in mean scores at low level of intelligence (t = 1.26, not significant).
- Pupil teachers with Deep Approach of learning and those with Surface Approach of learning under Science group yielded significant differences in mean scores at low level of intelligence (t = 2.48, significant).
- With Deep Approach, Arts and Science group scored equal levels of mean scores at low level of intelligence (t = 0.84, not significant).
- Pupil teachers following Surface Approach of learning scored higher means at low level of intelligence under Science group as compared to those with SA under Arts group (t = 2.65, significant).
- For Deep Approach, the mean scores of pupil teachers of Arts group were lower as compared to that of Science group pupil teachers with Surface Approach of learning at low level of intelligence (t= 2.21, significant).
- Pupil teachers with Surface Approach and studying under Arts group with and those with Deep Approach and studying under Science group scored equal levels of means at low level of intelligence (t= 0.59, not significant).

Discussion of the Results

Hypothesis 1: The analysis of data of the present study led to the acceptance of first hypothesis that Arts and Science group will yield equal levels of mean scores at ***high*** and ***low*** level of intelligence. Singh, B. (2008) supported this finding that pupil teachers under Arts and Science group failed to prove that the two groups distinguish with each other. However, at ***average*** level of intelligence the result contradicted this null hypothesis. Singh, N. (2009) article affirmed that the academic results of Arts and Science students differ due to the specific demands of these streams.

Hypothesis 2: The results concluded from Table 6 led to the acceptance of hypothesis that two learning approaches: Deep and Surface (DA/SA) will result in equal levels of means at ***high, average*** and ***low*** level of intelligence. Wannasilapa (2003), Meena (2006) and Singh, B. (2008) also reflected that both deep and surface learning approaches failed to yield any significant differences in their studies.

Hypothesis 3: The results based on the third hypothesis that Academic Streams (Arts/Science) and Learning Approaches (DA/SA) do not interact with each other to yield significantly different mean scores led to its rejection at ***average*** and ***low*** level of intelligence. But, the contrary result appeared at high level of intelligence.

The interaction effect found further on the basis of t-ratio's (Table 7) concluded that:

i. Different combination groups of academic streams and learning approaches at high level of intelligence (Section I) along with the following combination groups at average level of intelligence (Section II)
   - Science/DA and Science/SA
   - Arts/DA and Science/DA

   and for combination groups at low level of intelligence (Section III)
   - Arts/DA and Arts/SA
   - Arts/DA and Science/DA
   - Arts/SA and Science/DA, all failed to have significant results.

ii. Results for the following combination groups at ***average*** level of intelligence (Section II) i.e.,
   - Arts/DA and Arts/SA
   - Arts/SA and Science/SA
   - Arts/SA and Science/DA

and at ***low*** level of intelligence (Section III) :

- Science/DA and Science/SA
- Arts/SA and Science/SA
- Arts/DA and Science/SA

were significant and consistent with the findings of some researches conducted by Avery (1986); Miller et al (1990); Britton (1999); Salim Kumar (1999); Evans (2001); Struyven (2005) and Yuan (2006) which reflected that either the results tending to adopt more SA to learning or following other Strategic learning approaches irrespective of the fact that Deep Approach yields permanent retention of learning material.

iii. Only the following combination group at ***average*** level of intelligence (Section III) i.e.

- Arts/DA and Science/SA was significant.

The result clearly stated that this group considered deep learning approach best. This result is supported by number of studies where it has been observed that learning approaches do support the dependent variables like motivation, academic or independent creative study (Aggarwal, 1981); personality types and mathematics anxiety (Hinkle, 1987); students' grade point average, programme area (Thummarpon, 1988); gifted and non-gifted students (Steven, 1989); academic learning of students (Lindsay and Faulkner, 1996; Humphreys, 1998; Lucas 2001).

Educational Implications

- It is important to check out which academic stream is popular among students, as it will be beneficial for academicians, researchers, teachers, administrators to explore its hidden aspects, in terms of
  - Developing and framing the Curriculum
  - Methodology of teaching
  - Level of difficulty to be built in the curriculum
  - Caliber of students i.e. their attitude, aptitude, intelligence while opting any discipline or course etc.
  - Introducing the new courses/streams
  - Job opportunities available in the market
- Deep learning approach is proven to be a boon for enhancing the students learning as it helps
  - To generate interest in the subject or learning task
  - To discourage those learning approaches, which provide superfluous knowledge

- For better retention of the learning material
- Removes anxiety among students
- Provides feedback to the students
- Gives practical application to the learning task
- Maximum retention of the students in their opted streams

This being the case, there is a need to understand the difference between the ways students should be taught and the ways the students are currently being taught in different academic streams (as each academic stream requires different types of learning techniques to master the learning content matter or skill etc.). It is imperative then that educators involved in the teacher preparation process must be familiar with the types of support that suits best at different levels of students' intelligence to overcome the challenges toward learning process in different academic streams. This is important for two reasons. First, this support will help pupil teachers to be the most effective teachers in the future and second, this will encourage pupil teachers to remain in their teaching profession.

Other factors like intelligence, personality traits, attitude, aptitude, interest, motivation, etc. do play an important role in predicting learners' proficiency or their academic outcomes. Nonetheless, deep learning approach is an enjoyable learning process where the objectives like knowledge, understanding, application, skill formation, attitude formation and interest can be achieved at higher rate for attaining maximum learning outcomes.

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Gender Differences in Self-concept among Adolescent Students of Uttarakhand

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Abstract

The purpose of this study was to determine gender differences, region of residence and type of management on the self-concept of adolescents. A random sampling method was followed. The sample consisted of 800 respondents studying in secondary and higher secondary schools of Uttarakhand. The data was collected personally through a questionnaire on self-concept developed by R.K.Saraswat. It consisted of 6 dimensions of self-concept. Results indicated that boys and girls did not differ on total self-concept. However, significant differences were found between the groups formed on the basis of region of residence and type of management with respect to their overall self-concept at 0.05 level of significance.

Introduction

'Self' is one of the determinants of personality and contributes to the uniqueness of every individual. The concept of self has origin in the earliest history of personality theory. In the 17th century, the philosopher Descartes discussed the 'cogito' (awareness of one's own being) as the core of human existence. Sigmund Freud used the term 'ego' to refer to this organised aspect of personality. Allport used the term 'proprium' to refer to self and outlined eight stages in the development of proprium from infancy to adulthood.

According to Jung the 'self' is an archetype which develops during middle age and is the centre of the personality providing stability and equilibrium. However, self-concept is not innate but is developed through interaction with the environment (Brigham, 1986; James 1990). It is dynamic and can be modified due to interaction with various forces of environment in which the individual lives.

Self-concept is a comprehensive and exhaustive area which can represent the personality at large. It is a complex psychological construct. According to Carl Rogers (1959) it consists of the portion of personality which consists of the perception of 'I' and 'Me'. In

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other words, it refers to the ordered set of attitudes and perceptions that an individual holds about himself or herself. (Wolffe, 2000; Woolfolk, 2001; Tuttle and Tuttle, 2004; Rice and Dolgin, 2005). Several terms that are virtually synonymous with self-concept are self image (what the person is), ideal self (what the person wants to be) and self esteem (what the person feels about the discrepancy between what he is and what he would like to be).

Self-concept influences personality development of an individual in two ways. One is that if other people hold high positive attitude towards us, this enhances our self-image and self acceptance. The other is that if other hold negative attitude towards us, it creates feelings of worthlessness and consequently may lead to self defence or withdrawal from social situation. As has been found in various studies on adolescents, a positive self-concept may develop his personality to the fullest while a negative one may lead to disintegration of personality.

Rationale of the study

Adolescents go through biological, cognitive, social and psychological transitions. Psychologically, adolescence develops a sense of identity, self-awareness and development of self-concept. This challenging period is also a period of gender differences. According to Gilligan (1990) societal pressure on girls demanding them to be perfect is the main cause of loss of self confidence and self esteem, thus contributing to psychological disturbances at times. Further, the emphasis to look attractive to be submissive and respectful to others reduces the self esteem of adolescent girls (Harter, 1993, 1997). In a study, young women scored lower than young men, especially from 12 years on when their self-confidence and acceptance of physical self-image decreases (Orenstien, 1994; Marsh and Hattie, 1996). Rothemberg (1997) indicated that girls over 12 years were more at risk of suffering from depression than young men. Hence, a need was felt to explore whether this attitude is still prevalent in the modern Indian society where a lot of awareness about gender equality has come into existence.

Adolescence has also been termed as a period of storm and stress. However, adolescence is not only synonymous with difficulty but also success in every field of life. The main task of the adolescent is to achieve a state of 'identity'. However, in a society like ours, it often leads to 'identity crises' and 'confusion'. The adolescents are more introspective. They believe that their parents can never

understand them as their problems are different. Some studies have revealed about stability of self-concept during adolescence while other studies have found instability. Contrary to this, a study by Rosenberg (1989) revealed that adolescents develop unhealthy self-concept than adults. Further, a study on the gender differences in low vision adolescents showed that females scored lower on social and moral dimensions of self-concept while higher on physical self-concept (Rothemburg, 1997; Mohammad Al-Zyoudi, 2007). Harter et al., (1997) who found that blind people showed extreme values, they either had a very low self-concept or overrated their personal attributes as compared to sighted people. In contrast, Peterson, Sarigiani and Kennedy (1991) indicated that blind males had positive self-concept than blind females. After reviewing numerous studies with varied results, a need was felt to study the self-concept of adolescents in the present scenario. In the present study, the variants or dimensions of self-concept include: physical, social, temperamental, educational, moral and intellectual.

Dimensions of self-concept in the present study

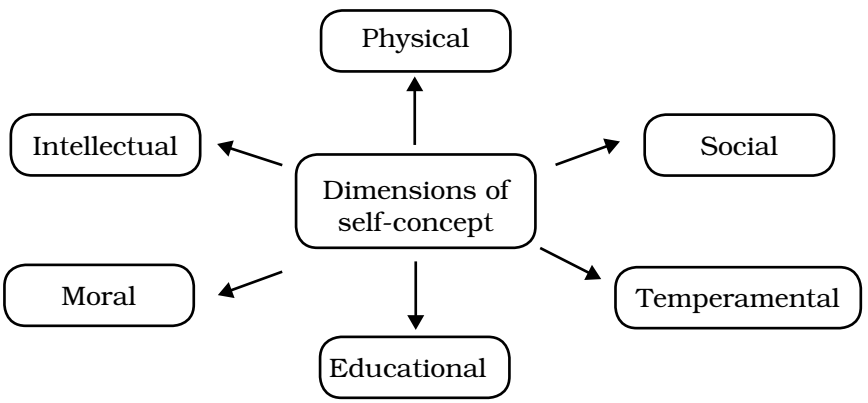

Figure 1

- **Physical:** Physical self-concept is the individual's view of the body, health, physical capacity, appearance and strength.
- **Social:** It refers to an individual's sense of worth in social interactions.
- **Temperamental:** It is the individual's view of prevailing emotional state or predominance of a particular kind of emotional reaction.
- **Educational:** It means the individual's view of himself or herself in relation to school, teachers and extra-curricular activities.

- **Moral:** Moral self-concept is the individual's estimation of moral worth i.e. right or wrong.
- **Intellectual:** Intellectual self-concept is the individual's awareness of their intelligence and capacity of problem solving and judgement.

About Uttarakhand State

Uttarakhand (formerly known as Uttaranchal) is the 27th state of India. It was established in 9th November, 2000. It is one of the extremely backward states of India. This state, which forms the north-west border area of the country, touching boundaries of Nepal and China, lies in the Central Zone of Himalayas. The state comprises of 13 districts out of which –Almora, Pithoragarh, Nainital, Bageshwar, Champawat and Udhamsingh Nagar constitute Kumaun division and the remaining seven- Uttarkashi, Chamoli, Dehradun, Pauri Garhwal, Tehri Garhwal, Rudra Prayag and Haridwar are components of Garhwal division.

Delimitation

1. The study was confined to secondary level students of Uttarakhand.
2. Students within the age group 13-17 years constituted the sample.
3. The study was conducted on the pupils of rural and urban background only.
4. The study was conducted on Public and Government school students.

Statement of the Problem

A study of gender differences in self-concept among adolescent students studying in secondary and higher secondary level schools of Uttarakhand.

Objectives of the study

1. To study the self-concept of students studying in secondary level.
2. To compare the development of self-concept of adolescent boys and girls.

The state of Uttarakhand covers an area of 53,566 sq. km. It touches the area of China, Nepal, Uttar-Pradesh and Himachal Pradesh. According to 2011, India census its population is about 10,116,752. Its capital is Dehradun, which is noted for the number of prestigious institutions, schools and universities in Uttarakhand. District-wise achievement in level of education is found to be quite encouraging except the female literacy which is found to be relatively low in Tehri Garhwal, Chamoli and Uttarkashi.

3. To compare the development of self-concept of urban and rural adolescents.
4. To compare the development of self-concept of Public School and Government School student.

Hypotheses

$H0_1$. Male and female students would not differ significantly on total self-concept and various dimensions of self-concept viz. physical, social, temperamental, educational, moral and intellectual.

$H0_2$. Urban students would not differ from rural students on total self-concept and various dimensions of self-concept viz. physical, social, temperamental, educational, moral and intellectual.

$H0_3$. Public School students would not differ from Government School students on total self-concept and various dimensions of self-concept viz. physical, social, temperamental, educational, moral and intellectual.

Methodology

The normative survey method was employed in the present investigation. Students studying in secondary and higher secondary schools of Uttarakhand comprised the population of the study. A random sampling procedure was followed and the sample consisted of 800 adolescent students.

Tool: The tool used for the study was Self-concept Inventory developed and standardised by R.K. Saraswat (1989, 95). It consists of 48 items and provides six separate dimensions of self-concept, viz., physical, social, intellectual, moral, educational and temperamental self-concept. It also gives a total self-concept score. The reliability of the inventory was found by test-retest method, and it as found to be 0.91 for the total self-concept measure. Reliability coefficients of its various dimensions vary from 0.67 to 0.88. The validity has been determined by estimating (i) content validity (ii) construct validity. For statistical treatment, Mean, S.D. and 't' test have been used for all the variables.

Scoring method: The respondent is provided with five alternatives which are arranged in such a way that the scoring system for all the items will remain the same i.e. 5, 4, 3, 2, 1 whether the items are positive or negative. If the respondent put (Ö) mark for first alternative the score is 5, for second alternative the score is 4, for third alternative score is 3, for fourth alternative the score is 2 and

for the fifth alternative the score is 1. The summated score of all the 48 items provide the total self-concept score of an individual. A high score on this inventory indicates a higher self-concept, while a low score shows low self-concept.

Analysis of Data

Gender differences and Self-concept

To test the hypothesis that gender differences would not differ significantly on self-concept, the sample was divided into two categories i.e. male and female students.

Table 1

Significance of Difference between the Means of Male and Female Adolescent Students on Various Dimensions of Self-concept

The data were analysed with an appropriate test of difference of the means for independent groups. Mean scores obtained by adolescent female students for each dimensions of self-concept were compared with their counterpart i.e. adolescent male students.

Dimensions of self-concept	Mean and SD		t value
	Male (N=400)	Female (N=400)	
Physical self-concept	28.92 3.95	27.78 3.79	**4.22****
Social self-concept	29.53 4.01	29.14 3.86	1.39
Temperamental self-concept	30.43 4.31	29.90 4.32	1.66
Educational self-concept	30.56 4.9	30.54 4.31	0.06
Moral self-concept	30.58 4.05	31.59 2.99	**4.04****
Intellectual self-concept	26.82 3.82	26.29 3.64	0.63
Total self-concept	176.85 16.73	175.09 15.82	1.53

*** Differences significant at 0.01 level*

- Results shown in Table 1 clearly indicate that there is no significant difference between male and female adolescents (CR=1.53, p>.05) with respect to their overall self-concept score. Thus, the hypothesis stating that boys and girls would not differ on total self-concept is sustained and the null hypothesis stands tenable.

- Significant differences was observed between the scores of males and females (CR=4.22, p<.01) with respect to physical dimension of self-concept. Here males were found superior (M=28.92) than females (M=27.78). Thus, the null hypothesis is rejected.
- No significant differences were found between male and female students on social (CR=1.39, p>.05), temperamental (CR=1.66, p>.05), educational (CR=0.06, p>.05) and intellectual (CR=0.63, p>.05) dimensions of self-concept.
- Girls showed more inclination towards moral values (M=31.59) than boys (M=30.58). Hence, significant differences (CR= 4.04, p<.01) was noted on moral dimension of self-concept.

Region of Residence and Self-concept

To test the hypothesis that region of residence would not differ significantly on self-concept, the sample was divided into two categories i.e. urban and rural students.

Table 2

Significance of Difference between the Means of Urban and Rural Adolescent Students on Various Dimensions of Self-concept

Table 2 presents comparison between the means of urban and rural adolescent students on various dimensions of self-concept.

Dimensions of self-concept	Mean and SD		t value
	Urban (N=400)	Rural (N=400)	
Physical self-concept	28.68 3.87	28.02 3.93	**2.36***
Social self-concept	29.66 3.83	29.01 4.02	**2.32***
Temperamental self-concept	30.58 4.18	29.75 4.42	**2.77****
Educational self-concept	30.77 4.71	30.32 4.51	1.41
Moral self-concept	30.95 3.64	31.21 3.54	1.04
Intellectual self-concept	26.90 3.76	26.21 3.69	**2.76****
Total self-concept	177.41 15.42	174.53 17.03	**2.50***

** Differences significant at .05 level*

*** Differences significant at .01 level*

- A perusal of Table 2 indicates that there is significant difference between urban and rural adolescent students (CR=2.5, p<.05) with respect to their overall self-concept. Thus, the hypothesis

stating that urban and rural students would not differ on total self-concept is rejected.

- Urban students were superior than their rural counterparts on physical (CR=2.36, p< .05), social (CR=2.32, p<.05), temperamental (CR=2.77, p<.01), and intellectual (CR= 2.76, p<.01) dimensions of self-concept.
- Region of residence did not account for educational (CR=1.41, p>.05) and moral (CR=1.04, p>.05) dimensions of self-concept. Thus, the null hypothesis is accepted at .05 level of significance.

Type of Management and Self-concept

To test the hypothesis that type of management would not differ significantly on self-concept, the sample was divided into two categories i.e. Public school and government school students.

Table 3

Significance of Difference between the means of Public school and Government School Students on Various Dimensions of Self-concept

Table 3 provides statistical testing of the two groups formed on various dimensions of self-concept. The mean scores obtained by Public school students for each dimensions of self-concept were compared with their counterpart i.e. Government school students.

Dimensions of self-concept	Mean and SD		t value
	Public School (N=400)	Government School (N=400)	
Physical self-concept	28.10 4.04	28.60 3.76	1.85
Social self-concept	29.62 3.99	29.05 3.87	**2.03***
Temperamental self-concept	29.59 4.41	30.74 4.50	**3.59****
Educational self-concept	29.15 4.60	31.94 4.19	**9.00****
Moral self-concept	30.33 3.87	31.84 3.11	**6.04****
Intellectual self-concept	26.38 3.61	26.73 3.86	1.35
Total self-concept	173.20 16.52	178.70 15.61	**4.89****

** Differences significant at 0.05 level*

*** Differences significant at 0.01 level*

- Table 3 indicates that there is significant difference between Public school students and Government school students (CR=4.89, p<.01) with respect to their overall self-concept score. Government school students (M=178.70) scored higher on total self-concept than Public school students (M=173.20). Thus, the hypothesis stating that type of management would not differ on total self-concept is rejected.
- Significant differences was observed between the scores of Public school students and Government school students with respect to social dimension (CR=2.03, p<.05), temperamental (CR=3.59. p<.01), educational (CR=9, p<.01) and moral (CR=6.04, p<.01) dimensions of self-concept. Public school students were superior to their counterparts i.e. Government school students on social self-concept whereas, Government school students scored higher on temperamental, educational and moral dimensions of self-concept.
- No significant differences were found between Public school students and Government school students on physical (CR=1.85, p>.05), and intellectual (CR=1.35, p>.05) dimensions of self-concept. Thus, the null hypothesis is accepted at .05 level of significance.

Discussion

In analysing the results of the study, the researcher found no significant differences existed in the self-concept of male and female adolescent students. Hence, the null hypothesis stands tenable. The findings are corroborative of the results of Bhogayata (1986) and Gyanani (1999) where no gender differences were found. However, Kumari, Sushama (2001) suggested that males had better global self-concept than females.

Males were found superior than females on physical dimension of self-concept (Table 1). Hence, $H0_1$ stating that 'boys and girls would not differ on physical dimension of self-concept' is rejected. The finding is in conformity to those of Gyanani (1999), Halder and Dutta (2010) who stated that boys perceived themselves to be more masculine. However, findings of Saraswat (1982) Rothemburg (1997) and Mohammad Al-Zyoudi (2007) do not agree to this result.

Social self-concepts are derived from social interactions with social groups – home, peer, or community. If a person who as a child or an adolescent was discriminated due to gender, race, social class, or religion, he will hold low self-concept. Results of our findings

have shown that there was no significant difference in social self-concept of adolescent boys and girls. The finding is contradictory to the finding of Saraswat (1982) and Gyanani (1999) who found girls higher on social dimension. Kagade (1997), Rothemburg (1997), Mohammad Al-Zyoudi (2007) found differences between boys and girls on social dimension of self-concept. Further, both the groups have shown above average on temperamental dimension of self-concept, but the mean score shows that boys (M=30.43) are emotionally stronger than girls (M=29.90). This finding is in conformity to that of Gyanani (1999) who suggested that girls are higher in emotional areas than boys.

The researcher feels that education is a potent weapon of social mobility. Hence, both the groups have shown equal weightage. The finding is in conformity to that of Kagade (1997) who stated that boys and girls do not differ in educational adjustment. The sub hypothesis stating that 'there would be no significant difference between boys and girls on intellectual dimension of self-concept' is accepted. The computed t value is 0.63, which is not significant at 0.05 level. The result is contradictory to that of Gyanani (1999); Halder and Dutta (2010) who stated that males were higher than females on intellectual dimension of self-concept. Girls showed more inclination towards moral values (M=31.59) than boys (M=30.58). Hence, significant differences (t= 4.04) was noted on moral dimension of self-concept. The researcher feels that girls have higher moral and religious values; they are sensitive, honest, truthful, god fearing and believe in disciplined life. This result is contradictory to the finds of Rothemburg (1997) Mohammad Al-Zyoudi (2007) who found that females scored lower on moral dimension of self-concept than their conterparts i.e. males.

After analysing the data in Table 2, the $H0_2$ which stated that 'urban students would not differ from rural students on total self-concept and various dimensions of self-concept viz. physical, social, temperamental, educational, moral and intellectual' is rejected at 0.05 level of significance. Findings revealed that urban students have scored more than their rural counterpart on physical, social, temperamental and intellectual dimensions of self-concept (Table 2). Although, region of residence did not account for educational and moral dimensions of self-concept, the mean scores of urban students were higher in both the dimension. The findings of Bhogayata (1986) support our findings. He stated that urban students had higher self-concept than their rural counterparts.

A perusal of Table 3 indicated that although both the groups have scored above average on total self-concept, the mean score of Government school students (M=178.70) are higher than Public school students (M=173.20). The Government school students were better on temperamental, educational, moral dimensions of self-concept while the Public school students were superior on social and intellectual dimensions of self-concept. Thus, $H0_3$ which stated that 'Public School students would not differ from Government School students on total self-concept and various dimensions of self-concept viz. physical, social, temperamental, educational, moral and intellectual' is rejected at 0.05 level of significance.

It is noticed that Public school students (M=29.62) were superior to the Government school students (M=29.05) on social dimension of self-concept. The researcher is of the opinion that the process of socialisation and family background affects social behaviour. The family teaches social qualities like cooperation, friendliness and sympathy which are desired behaviour. The students studying in Public schools belong to middle or higher income group and are from educated background. They belong to a social group where socially desired behaviour is expected from them. They are exposed to a wide environment. Their parents motivate them and provide facilities to them. They encourage them and also have high expectation from them. This enables them to interact and take initiative. They are democratic in their thinking and choose their own career. Students studying in Government schools in our sample belonged to both rural and urban areas. Those from rural background do not have much exposure and therefore hesitate in decision-making. They have inhibition to interact with other sections of the society. Therefore, inspite of showing inclination towards social dimension of self-concept they are still below their counterpart.

The researcher feels that the Government school students (M=30.74) are more sensitive, emotional, fearful and impulsive hence they scored higher on temperamental dimension of self-concept. This may be because most of them are from low income or middle income group. The Public school students (M=29.59) are more optimistic and broad minded than their counterpart. However, the result showed that both the groups have shown above average on this dimension of self-concept.

Although both the groups have shown above average self-concept, the Government school students (M=31.94) scored higher in educational dimension of self-concept than their counterparts

i.e. Public school students (M=29.15). Hence, significant differences (t= 9) was noted on educational dimension of self-concept. This may be because education is the only potent weapon for vertical social mobility. In other words, by obtaining education they can also earn money and luxuries of life. It will help them to rise up in the society and get a white collared job which is not possible otherwise.

Comparing the two groups formed on the basis of type of management, it was observed that Government school students showed more inclination towards moral values (M=31.84) than Public school students (M=30.33). The researcher feels that the type of management affects moral self-concept because the sample comprised of both rural and urban students. The Public school students are influenced by the Western culture. They have modern outlook and mostly belong to high or upper middle class. The Government school students who mostly belong to middle and lower income group still maintain the moral values taught by their families. They have yet not been completely influenced by the western culture. Hence, the Indian values of honesty, truthfulness are still present in them.

There is no significant difference between Public school students and Government school students on intellectual dimension of self-concept (t=1.35). Type of management does not affect intellectual dimension of self-concept. The researcher is of the opinion that intelligence is an inborn trait. The result is contradictory to the findings of Pareek (1990) who stated that adolescents studying in Private schools were more intelligent than those in Government schools.

Conclusion

Considering the findings and discussion of the study and taking into account the hypotheses of the study following conclusions have been drawn:

1. Gender differences does not affect self-concept though significant differences were observed in the two groups on physical and moral dimension of self-concept. Boys scored higher on physical self-concept while girls perceived themselves high on moral self aspect.
2. Further, findings revealed that region of residence does affect self-concept of adolescents. Urban students had higher self-concept

than their rural counterpart on physical, social, temperamental, educational and intellectual dimensions of self-concept while rural adolescents scored higher than them on moral dimension of self-concept.

3. Type of management did not affect physical and intellectual dimensions of self-concept. Public school students scored better on social dimension of self-concept while Government school students were superior on temperamental, educational, moral and total self-concept.

Educational Implication of the study

Self-concept is a special framework that influences how we process information about the social world around us along with information about ourselves such as our motives, emotional states, self evaluations and much more. Since children's motivational beliefs, perception, attitudes and eventual occupational choices are shaped by their parents, teachers and cultural forces (Jacobs, Chhin and Bleeker, 2006; Nosek et al. 2009), it is essential to develop a healthy self-concept in them which will enable them to enhance their personality to the fullest. Children should be provided with basic capacities such as education, knowledge and skills to empower them and make them responsible adults. Social and economic support network are essential to guide them in times of crisis. Freedom to explore and experiment yet protection from danger- such a type of environment should be created for children and adolescents (Baumrind, 1991). Along with this, feeling of acceptance, positive feedback and a sense of caring attitude will help them to develop positive self-concept. This is because individuals who develop healthy self-concept have more confidences in their abilities; they are able to take decisions properly and are more successful in their life and career. While those with negative self image view themselves as failures in life and have difficulty with their social skills (Vernon, 1993). Hence, adolescents should be respected, approved and accepted for what they are by the person or group which influences them. They should be encouraged to form a favourable social judgement about themselves. On the contrary, if they are blamed or rejected, it negatively affects their self-concept. Low self esteem tends to make a person set low goals. It leads to lack of persistence, ambition and even isolation. Hence, the present findings bear significant implications for parents, teachers, educationalists and society.

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ERIC Projects Completed

A Theory of Mind Based Programme for Enhancement of Children's Social Skills

NANDITA BABU

Theory of mind refers to the ability to attribute mental states to the self and others. This concept links up two very important areas of human development namely, cognitive and social. The quality of our relationships is affected by the extent to which we understand other people's feelings, needs and motivation. Social insight and understanding of the social environment are often considered to be important abilities that underlie socially skilled behaviour. Aspects of relationships ranging from shared humour, to manipulation of control and power within a dyadic relationship, depend on a sophisticated grasp of others' desires, needs, ideas and capacities. Theory of mind and identification of emotions can be seen as complementary to each other (Steerneman, 1994). Placing one's self in the position of others occurs with the help of a theory of mind. Social insight and understanding of the social environment are often considered to be important abilities that underlie socially skilled behaviour. He has introduced an intervention programme, a social cognition training which is based directly on theory of mind ideas. Children with difficulties in social functioning, often appear to have difficulty in attributing mental states to others, which contributes to a reduced ability to empathise with others. This recognition allied with other ideas concerning social-cognitive development provides the framework for Steerneman's training approach. In Steerneman's work, theory of mind is approached through tasks aimed at learning to recognise the difference between fantasy and reality, learning to assess a social situation and learning to recognise the intentions of others. Follwing the similar trend the present study aimed to investigate the relationship between Theory of Mind and Social Skills.

Objectives

Objectives of the present study are as follows:

1. To study the relationship between theory of mind and social skills of children.

2. To develop and use a theory of mind based training programme to enhance the social skills of children with social skill deficits.
3. To modify the programme in a manner that it can be incorporated in the class curriculums of younger children and be taught by the class teachers.

METHOD OF STUDY

Design

This study followed a single-group pre-test-post-test design. The sample for intervention was identified based on Theory of Mind task and Social Skill questionnaires. Post-intervention assessment was done using the Social Skill questionnaire.

Participants

For the first phase of study a total of 150 students from grades 3rd, 5thand 7th were taken from two government schools of Delhi. For the second phase children showing social skill deficits were selected. Based on their assessment of social skills, a total of 66 children constituted the sample for intervention.

Tools Used

Standardised tasks and rating scales were used to assess the theory of mind and social skills of the sample. A questionnaire and a checklist were used to assess child's social skills and a story task was given to assess child's false belief. As these tests are internationally constructed instruments, necessary modifications were made for Indian children.

- Social skills measures

These measures were developed by S.H.Spence. The two measures were: Social Situation checklist and Social Skill questionnaire. These were then translated in Hindi, and certain modifications were made in the items according to Indian context. The adapted versions of Social Skill Questionnaire and Social Situation Checklist are called *Samajik Kaushal Prashnawali* and *Samajik Paristhti Suchi* respectively.

- Theory of Mind task

The task consisted of a false belief story i.e. *chocolate box story*. The story was narrated to the children with the help of pictures. After the narration of the story children were asked different questions assessing their false belief understanding (First-order, Second-order).

Procedure

The present project was carried out in three phases.

Phase 1:

The first phase was an assessment phase. The assessment of 150 children was done from three groups- Grade 3, Grade 5 and Grade 7 on their social skills and ToM abilities.

Phase 2:

In the second phase, a Theory of Mind based Intervention Programme was constructed and carried out with 66 students identified as having social skill deficits.

Phase 3:

In the third phase of the study 16 students were selected for Individual Intervention. These were the students who showed lessened benefits in some domains but overall showed improvement in social skills after second phase.

Result and Discussion:

Phase 1:

On the basis of the obtained scores, students were categorised as those having good social skills, average and poor social skills. The criteria for classification are as follows:

Good social skills: Above 75 per cent, i.e. those obtaining scores above 45.

Average social skills: Between 50 per cent and 75 per cent, i.e. those obtaining a score between 30 and 45.

Poor social skills: Below 50 per cent, i.e. those obtaining below 30.

Apart from being investigated on social skills, students were also given a theory of mind test. The student's responses were classified as: mental state (elaborate), mental state (non-elaborate), and non-mental state. A one-way ANOVA was applied to see if there was any significant difference in the (Theory of Mind) ToM scores across children having different levels (good, average and poor) of social skills. A significant difference was found to occur, **$F(2, 146) = 12.29$, $P < 0.01$.**

Phase 2:

The second phase of the study involved implementing the Intervention programme. The students who obtained a total score of Average and Poor were selected. For each student, the deficit

domain was identified based on the 6 domains in the questionnaire: Social Anxiety, Assertiveness, Control, Conflict Situation, Dealing with Authority Figure and Making Friends.

Post-intervention the children were again assessed on *Samajik Paristhiti Suchi.* A 't' test was applied to assess if there was any significant difference in the students' social skills post-intervention. No significant difference was found between the pre-test and post -test total scores of the children found to have deficit in Phase 1. Further, t-test was also applied to see if there was any significant difference between the pre-test and post-test scores in every domain. It was found that the domain of 'Making Friends'had a significant increase between pre and post-intervention. In other words, students reported an increase in their ability to make friends and maintain friendships. Further, the mean scores of students were also analysed domain wise. Doing this, it was found that along with an improvement in score in the domain of 'making friends', there was an improvement in the domain of 'social anxiety'. Thus, it can be suggested that children's anxiety or discomfort in social situations reduced and they had an improvement in making friends and maintaining friendships.

Interpretation

The intervention programme has shown mixed results. While students have shown improvement in some domains, they have also shown no improvement in other domains, as seen in their profiles. There was a significant difference between pre-test and post-test for one domain i.e. Making Friends. In other words, students reported greater number of friends, improved ability to start new friendships, resolving conflicts with friends, approaching a group of friends to start playing and maintaining friendships. At the same time, many students also showed improvement in social anxiety, i.e. they have reduced discomfort in dealing with strangers and in social situations. A significant positive correlation was found between the total post-test scores of Social Anxiety and Making Friends ($r=0.47$, $p \leq 0.05$). In other words, as students' Social Anxiety reduces their friendships also improve (higher scores on social anxiety in assessment questionnaire indicate reduced social anxiety).

A difference between the three grades (Grade 3, 5 and 7) is observed. It is seen that Grade 5 has shown maximum improvement. The mean score of students in Grade 5 has improved in 5 out of 6 domains: Social Anxiety, Assertiveness, Conflict situations, Problem

with Authority Figure and Making friends. This may have occurred because Grade 5 students were most receptive to the Intervention amongst all three grades as per their developmental level, they were more settled/less impulsive and had a higher self awareness than younger students (Grade 3), and more open/receptive than older students (Grade 7 who were preadolescents). The preadolescent stage is generally associated with changes in physical, emotional self and is seen to be marked by social identity crisis; this may be the reason for the Grade 7 students to be a little resistant in accepting the training.

Limitations of the study

One of the major limitations of the present study was that the context of the child's development including his parents and teachers were not included in intervention. It is critical that the child's home and school environment provides models of prosocial behaviour and reinforces prosocial behaviour in children. This could not be addressed in the present study.

There was also a limitation in the assessment carried out in the study. The students were identified for intervention on the basis of social skill questionnaire. Observation, both pretest and post-test, should have been included in assessment. Situational tasks should have also been used in assessment to provide a more complete profile for each student's social skills.

Furthermore, the entire classroom should have been included in the intervention. Instead, students with deficit were removed from the classroom to participate in a formal social skills training programme. Research suggests that rather than removing aggressive and noncompliant students from the classroom for individual or small-group training, interventions should be integrated into the regular classroom, not only to teach prosocial behaviours in the setting in which they will be used, but also to prevent socially competent students from rejecting their socially inept classmates and driving them further into deviant peer groups (Webster-Stratton, 1993).

Suggestions for future research

Social skills training should follow a longitudinal approach. This will allow constant monitoring and supervision of the child's progress and allow the researcher to design developmentally appropriate

activities. It will also enable the child to gradually become self-aware and practice the skills in everyday life.

Furthermore, the social skill training should be integrated into the regular classroom activities. Rather than removing the child with social deficits from the classroom, socially competent children in the classroom should also be involved in the training programme. This will enable prosocial behaviours to be learnt in the setting in which they will be used, and also prevent socially competent students from rejecting their socially inept classmates and driving them further into deviant peer groups.

Parents and teachers are a critical source of socially skilled adults who can be modeled by children and who can reinforce their prosocial behaviour. Thus, it is critical to provide parent and teacher training and to integrate them in the social skill training programme. The intervention programme should have an ecological approach i.e. where student problems are seen as arising not only from child characteristics but also from mismatches between student variables and environmental variables, including classroom management and instructional practices (Barnett, 2002; Truscott et al., 2005).

The assessment of the child should include parent and teacher reports, children's self reports, classroom and home observation, as well as situational tasks. This will allow the researcher to obtain a complete profile of the child and target the areas where intervention is required.

Conclusion

In spite of the shortcomings of the research, it can be concluded that a Theory of Mind based training programme, which focuses on perspective taking and empathy would be effective in enhancing the social skills of school children.

Education for the Challenged Children : Trends and Innovation in East Khasi Hills District of Meghalaya

Dr Sumana Paul

Introduction

The whole world is progressing towards globalisation and India is no exception to it. However, we still neglect the core issues of our country; the children with disability and their inclusion in the normal school curriculum. When significant progress has been made in many countries like USA, UK towards the issue concerned, we cannot afford to be left behind.

In every democratic society like India, every child has the right to education, the right to receive help in learning, to the limits of the capacity whether it is great or small. All children are given equal opportunity to learn whether they are average, bright, dull, retarded, blind, crippled, etc. Equality of opportunity denotes two things—equality of access to school education and equality of success in school. In every classroom there are some individuals who by virtue of their disabilities require more relevant or appropriate instruction. A domain of education has been constructed to satisfy learning requirements. The foremost goal of special education is finding and capitalising the children's special abilities. The National Policy on Education 1986 has made a significant contribution towards developing educational opportunity for the disabled children.

Raising a mentally handicapped child in a family involves many difficulties and problems to the parents and other family members. Because of these difficulties and problems, the family functioning in such families gets affected.

Education of disabled children has basic concepts and goals in common with the education of all children. The children with visual impairment, hearing impairment, mentally retarded and orthopedically handicapped have feelings, drives, emotions and motives common to normal children in general. Along with those common characteristics there are specific characteristics that warrant special services in their educational programmes. It can be

provided either in regular classroom or special classes within the regular school and in special schools to strengthen their abilities and grow according to their potentialities. Such special services or special education may vary depending upon the type of disabilities.

Thus, different categories of disabled children require different types of educational modifications. A teacher with multi-talents will provide well-designed educational programme based on the nature, type and degree of disability to circumvent their disabilities and capitalise their abilities.

The international move towards inclusion of special needs children into mainstreaming classrooms rather than educating them in an isolated environment has been a main concern raising, issues and interest for educators, policy-makers and researchers in recent times. The role of teachers in the successful implementation of inclusive education cannot be emphasised enough.

Therefore, the present study was conducted to understand the different aspects pertaining to children with disability as well as the views of the teachers and parents concerning the same.

After careful scrutiny of the relevant literature available a need was felt for the development of relevant tools for the study of causative factors of disability, problems faced by children with disability, existing facilities for them in special schools and the views of teachers and parents on inclusive education.

Necessary information was collected using all the tools mentioned earlier. The data thus collected was summarised and analysed with the help of means and then subjected to suitable statistical techniques.

Studies of this nature are of great help in planning intervention programmes and need based parent education programmes. The policy makers can also make use of the results of the present study while developing support systems.

Implication of the Study

The present study sheds some light on the problems faced by children with disabilities in different walks of life. The research also concentrated on the facilities available for the education of children with disabilities in special schools. It has also identified awareness, attitude and competencies of special and normal school teachers to deal with children with disability. Finally, the study was an attempt to throw light on the views of the parents and teachers of both disabled and non-disabled children on inclusive education.

It offers hope to those schools ready to implement inclusive education. The study would also encourage the school authorities and the educational bodies to take initiatives in establishing schools providing inclusive education. The role of teachers is seen as being central to the successful implementation of inclusive education.

It is also expected that the study would lead the readers to value and respect the roles and responsibilities of teachers, parents and other stakeholders in the field of education and maintain a positive attitude towards special children and inclusion. For the teachers too this study would create awareness in them of the challenging task facing them. They must understand the most common types of learning and physical disabilities and the typical symptoms of manifestation. They must also understand that there are individual differences among students with learning disabilities. The teachers must understand how to implement inclusive practices, by teaching techniques such as hands-on activities, group work, and computer based learning for all students. They must also understand the process of collaboration and team teaching with other teacher.

On the whole, the present study gives better insight for policy planning, development and implementation of educational programmes for the disabled. It is a daunting task but a hopeful one for all the children who have a right to education.

Statement of the Problem

Keeping the above discussions in mind, the statement of the problem is given as follows.
"Education for the challenged children: Trends and Innovation in East Khasi Hills District of Meghalaya"

Objective of the study

The present study was conducted with objectives to study the causative factors of disabilities, to study the general problems of challenged children as well as to know about the existing educational facilities for challenged children. The study also aimed to understand the attitude of parents and teachers towards inclusive education.

Methodology

The methodology followed in the study comprised construction of research tools, sampling procedures, data collection and statistical techniques used in the study.

Sample of the study

The area of the study comprised Shillong and for the purpose of the study, the investigator selected randomly five special schools providing services to children with disability.

Some of these schools were very cooperative and provided their support towards the study by providing necessary information as per the requirement.

The study covered a total number of 305 special children between the age-group 5 and 18 years where the ratio of male is higher compared to female. Also, most of the children in the sample happened to belong to middle class families and very few children sampled are from high economic profile families.

Data Analysis and Interpretation

The data was analysed based on an innovative mixed approach of combining both quantitative and qualitative analysis of available data.

The data collected from teachers and parents were analysed with the help of Mean, SD and 'CR' test techniques of statistics. The tables exhibit Mean value, SD and CR of each of the variable of the respondents towards inclusive education.

Findings of the study

With regards to the causative factor of disability, it is found that disease is one of the major causes of disability among the children followed by accidents. It reveals that there are more chance of disability to occur in the children in their infancy and childhood stage. Besides, it is found that disability among new born babies is due to pregnancy problems, falls or disease during pregnancy, immature birth, malnourished mothers, etc. The study shows that most of the sampled children are affected with mental retardation.

On the other hand pertaining to the existing educational facilities for the challenged children, it is found that most of the sampled schools have a Centre for Special and Inclusive Education as well as have facilities of vocational training services adult leisure and learning unit, community based rehabilitation, awareness programme and Referral Services (Consultancy), life skill education and in-house training for the staff besides other services.

The present study also revealed that children suffer from more than one disability and the common problems faced by special children are mobility, hand function, personal care, incontinence,

communication, learning, hearing, vision, behaviour, consciousness, etc. While in the school, the major difficulties faced by the special children are difficulty in reading/writing and learning, taking part in games and sports, taking part in extracurricular activities, getting along with other children, food habits, etc.

Further with respect to the attitude of Parents and Teachers towards Inclusive Education is found unfavourable. However, when compared between teachers and parents of normal children and special children, it is found that the attitude of the parents and teachers of the special children is more positive towards inclusive setup.

Suggestions for further research

1. Education for the Challenged Children: Trends and Innovation in Garo Hills District of Meghalaya.
2. Education and Care of the Mentally Challenged with special reference to Meghalaya
3. Inclusive Education for Children with Special Needs—Duties and Responsibilities of the Teachers
4. What Is the Role of Special Education Teachers in the Classroom?
5. Integrating Technology into Instruction in an Inclusive Classroom for Diverse Learners
6. The role of teachers in the successful implementation of inclusive education in the schools of Meghalaya.
7. The importance of having the right set of attitudes in teachers who are involved in inclusive education—an analytical approach.
8. An analysis of the course content or syllabi prescribed for the B.Ed. and other training courses in various colleges and institutes of the state of Meghalaya with particular attention being paid to special education.
9. A study of the government policies and laws concerning the promotion of inclusive education in schools and the initiatives taken to train teachers for inclusion.
10. The organisational structure, professional interactions, motivational climate and the working of the teachers in different types of special schools located in rural and urban set up in Meghalaya—A study.
11. A comparative study of special schools with healthy practices and characteristics in Meghalaya and West Bengal.
12. Indispensability of the change in attitude of the community towards disability—A Study.

Development of a Training Package in School Mathematics (DTPSM) for Pre-Service and In-Service Teachers

PROF. CH. VIJAYALAKSHMI* AND MRS. K. V. SHAILAJA**

The country needs, today effective and productive citizens who display scientific and constructive thinking and attitudes in all walks of life. In this direction, a new chapter is opined into the 21st century, which is going to be an era of science and technology. The child of today has to be prepared for this era of technology for which a strong base of mathematics education is a necessity.

Mathematics has prominent place at the school. Secondary education is the minimum requirement for life. After completing Secondary education some students enters into life while others go in for higher education. It is on account of this fact, that it has been suggested that the curriculum at the secondary stage should be terminus as well as preparatory and should comprise mathematics.

Mathematics is a discovery of human mind and learning mathematics is supposed to be a re-discovery at least to some extent. To achieve this goal, the classroom could be turned into a laboratory or a work room for the improvement of mathematics education. Here pupils work and learn by developing, constructing knowledge, self learning, self-study, exploratory and investigatory techniques. But it is important to observe that even today, after 65 years of Independence, the education system in India remains essentially examination oriented. Under this system, learners do not receive mathematical education. They mostly prepare themselves for examination and success in examination. Such a situation not only damages the purpose of all education but also proves ruinous for mathematics education. Learners memorise important results, theorems, formulae... in order to be able to reproduce them in the examinations. The result is meaningless and mechanical learning, which leads the pupils committing more and more mistakes.

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Need and Significance of the Study

Many changes and improvements are being brought in the field of education. In mathematics this change is vast and manifold as mathematics occupies the place and pride in the present age of Science and Technology. In addition to utilitarian, disciplinary, intellectual and cultural values mathematics has the characteristics of simplicity, brevity, accuracy, certainty of results, originality, verification of results, similarity to the reasoning of life, development of concentration, art of economical living, power of expression, self-reliance, attitude of discovery, quality of hardwork, National and International understanding and so on.

Good mathematics education depends not so much on the syllabus as on the teacher, the teaching approaches and the learning strategies developed in children, since all these can give meaning to the syllabus. In the secondary school mathematics curriculum, many changes and improvements have come all over the world. Unfortunately, many of these attempts took place without a simultaneous effort to expose educators to research on the nature of mathematical concepts and the process of learning them.

Hence in this research project an attempt is made to develop instructional strategies that could be used as training packages for pre-service and in-service mathematics teachers in order to minimise the mistakes committed by students in mathematics at secondary school level.

Objectives of the Study

The objectives of the present study are:

1. To identify the difficult units/concepts for teachers to teach in secondary school mathematics.
2. To identify the difficult units/concepts for students to learn in secondary school mathematics.
3. To develop Instructional strategies, for teaching the selected basic mathematical concepts, useful for pre-service and in-service teachers to improve the quality of mathematics education at school level.
4. To validate the effectiveness of the developed Instructional Strategies

Hypothesis

The developed instructional strategies (could be used as training package for pre-service and in-service teachers) are more effective

than the existing method of teaching basic mathematical concepts at secondary school level.

Tools Developed and Used in the Study

To achieve the first and second objectives of the study three opionnaires were prepared both for teachers and for students to find out the most difficult unit/concept at each of the standards VIII, IX and X to teach and / or learn and identified as 'Polynomials', 'Motion Geometry and 'Linear Programming respectively. Based on Vygotsky's and Piaget's theories Instructional Strategies (lesson plans) were prepared to fulfill the third objective. The following tools were constructed and used for the validation of the Instructional Strategies.

1. Achievement Test for the Concept 'Polynomials'
2. Achievement Test for the Concept 'Motion Geometry'
3. Achievement Test for the Concept 'Linear Programming'

Major Findings

The major findings of the study are given below.

Comparison of Means

The means of Achievement score in the basic mathematical concepts of the pre-test and post-test of the experimental and control groups in standards VIII, IX and X were compared by two statistical techniques 'Effect Size' and Test of Significance of Difference between means.

i. Effect Size

The comparison of Achievement score means by using the statistical technique 'Effect Size' was done for three standards VIII, IX and X.

It was found that the new Instructional Strategies of the Concepts, 'Polynomials', 'Motion Geometry' and 'Linear Programming' improved the performance of students significantly.

The mean Achievement scores obtained in the post-test of the experimental and control groups were compared using effect size in standards VIII, IX and X.

The obtained values of Effect size indicate that an average student in the experimental group of these standards had an Achievement significantly greater than that of the control group.

ii. Test of Significance of Difference between Means

The comparison of means of Achievement scores using the statistical technique 'Test of Significance in Difference between Means' was done. The pre-test scores of the experimental and control groups of standards VIII, IX and X were compared.

The obtained 't' values indicate that in standards VIII and X there is no significant difference between the mean pre-test scores of the experimental and control groups. That is both the groups were equivalent in terms of the pre-test scores. But in standard IX no significant difference between the mean pre-test scores of the experimental and control group was noticed. That is the experimental and control groups of standard IX were not equivalent in terms of pre-test scores.

The comparison of Mean post-test Achievement scores of the experimental and control groups of Standards VIII, IX and X were done by the test of significance of difference between means.

It was found that there is significant difference between the Mean post-test scores of the experimental and control groups of standards VIII, IX and X. The significant values of 't' indicate the better performance of students of the experimental groups in the post-test. This is due to the effect of the treatment (teaching the concerned mathematical concepts by the newly developed Instructional Strategies) given to the experimental groups.

Conclusions and Interpretations

In the new Instructional Strategy, the activities are taken from the familiar surroundings of the students. These activities and hands on experiences are understandable, suitable to their needs and sufficiently elaborated. Elaboration means internal processing of new and prior knowledge in a meaningful context. Elaborative strategies for new information result in better learning.

Therefore, the new developed Instructional Strategy enabled the students in the experimental group to have better Achievement in the basic mathematical concepts than the students in the control group who have been taught by Conventional Method of teaching.

Educational Implications

The present study revealed that the newly developed Instructional Strategies based on Piaget and Vygotsky's theories prepared for teaching the three selected basic mathematical concepts each from

standards VIII, IX and X are very effective than the conventional method of teaching mathematics.

Following the structure of the developed Instructional Strategies, for teaching any mathematical concept, Instructional Strategies can be developed by a mathematics teacher for the clear concept formation and attainment and also to prevent the students in committing mistakes while solving problems.

The PI found that the newly developed Instructional Strategy enables the students to learn to think mathematically and make sense in mathematics. It also develops collaborative learning and communication skills (mathematical as well as language) in students. Students develop problem solving capacities and experiences of the actual mathematical process.

This approach reduces gap between the teacher and students as they work together in discussions, in joint activities, academic conversations, exchange ideas and so on. This gives ample opportunities for the teacher to understand the level of attainability of each student.

Adopting this newly developed Instructional Strategy in the secondary school mathematics education, students can acquire the basic mathematical concepts, which is essential for the content mastery in mathematics. This approach reduces committing mistakes and most of the other problems related to teaching learning of mathematics at secondary school mathematics education.

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