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Problem solving skill among the school going students: A comparative study between CBSE and WBBSE board schools

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Abstract
In this given paper researcher wait to study the problem-solving skill among school going students with regard to their board of schools, level of education, gender, medium of instruction, No of siblings, habitat.For the present study researcher was selected 360secondary level students (vii-ix) among CBSE and WBBSE affiliated schools. For collecting data researcher was used a self-made problem-solving skill assessment scale. Collected data was analysed through descriptive statistics and inferential statistics (T-test, ANOVA and factorial ANOVA) using SPSS (version 20.0). Researcher was found the result that there is significant difference on problem solving skill among CBSE and WBBSE boards schools' students with regard to their affiliated boards. No significant difference on problem solving skill among school going students was found with regard to theirgender, medium of instruction, class, habitat and No of siblings.

Keywords: problem solving skill

Introduction

Life skills are a group of empowering skills that enable people to cope with life and its challenges and changes. Life skills support psychosocial well-being, promoting good communication, positive thinking, analytical skills and goal setting, cooperation and coping. Strengthening life skills helps individuals and communities to manage challenges and risks, maximize opportunities and solve problems in co-operative, non-violent ways. Life skills are psychosocial competencies and abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life. Life skills are vital to psychosocial recovery after a crisis event and are closely linked to the concepts of behavioural change, psychosocial well-being and resilience. According to WHO, (WHO, Geneva, 1994) [30] the life skills field suggests that there is a core set of skills that are at the heart of skills- based initiatives for the promotion of the health and well-being of children and adolescents. These are as follows Self-awareness, Interpersonal relationship, Decision making, Problem solving, Effective communication, Empathy, Critical thinking, Creative thinking, coping with Emotions, Coping with stress. Under of these skills problem-solving skill is vital and most important because problem solving enables us to deal constructively with problems in our lives. Significant problems that are left unresolved can cause mental stress and give rise to accompanying physical strain. In a constantly changing environment, having life skills is an essential part of being able to meet the challenges of everyday life. Life Skills are essentially those abilities that help to promote physical, mental and emotional well-being and competence to face the realities of life. Problem solving enables us to deal constructively with problems in our lives. Problem solving skill is necessary and important for lead life. Life is purposeful, so deferent skills have to necessary to develop in life, one them the problem-solving skill is important because human life is full of problem. We are faced with some problem or other. Some of the problems are simple in nature and are easily solved. Other are complex and require systematic thinking before they are solved. When a problem is faced the individual`s concepts and memory together bring reflections of perceptions of materials with which the problem is associated. By such perceptions the individual traces and retraces relationships until the problem is solved. The ability to solve problems is a basic life skill and is essential to our day-to-day lives, at home, at school, and at work. Every individual need problem solving-skills for healthy and positive ways of living.

Literature Review

Perveen, K. (2010) [21] conducted a study "Effective of the problem-solving approach on academic achievement of students in mathematics at the secondary level" to find out the problem-solving approach showed much batter achievement compare to the control group. The pre-test and post-test research instruments were used for the study. The researcher found that both the experimental and control group were almost equal in mathematics base at the beginning of the experiment. The experiment group outscored the control group significantly on the post-test. In the study of Wismath S, Orr.D. and Zhong. M. (2014) [29] conducted a study entitle as **"**Student Perception of Problem Solving Skills". This study investigates the perception of students of taking a university liberal education course designed to develop problem-solving skills.

In the study of Senduran.F. & Amman. T. (2015) [25] conducted a research entitle as "Problem-Solving Skill of High School Student Exercising Regularly in Sport Teams". To find out the effect of regular sport activities on the problem-solving approaches performed by high school students when they encountered said problem was analyse. The researcher found that a significant different was found among self-confident approach values of athlete and non-athlete students (U=45.0, p=0.008). A significant difference was observed among assessor approach values of athlete and non-athlete students (U=46.2, p=0.003).

Dusek.G. & Aynur. B. A. (2014) [8] conducted a study entitle as "A Study on Problem solving skills of the children from broken family and full parent's family attending regional primary boarding school".The objective of the study was to examine the problem-solving skills of children from broken family and full parent's family in regional primary boarding school.The researcher revealed that there is no significant difference in the problem-solving skills of children from broken and full parent families and attending boarding schools creates a negative significant difference in both groups

S. Gulcan and B. N. Pervin (2016) [7] conducted a study entitled as "Analysis of 4th Grade Students Problem Solving Skills in Terms of Several Variables".The researcher revealed that problem-solving skill among the students showed no significant difference compared with student`s gender variables and showed significant difference comparing with mother`s & father`s education level and showed a meaningful deference between state & private schools.

Cramer. S (2016) conducted a study "The Effects of Social Stories on the Problem-Solving Skills of Pre-schoolers". To examine the effect of social stories on the problem-solving skills of pre-schoolers in a Montessori classroom. The research showed that increased in the abilities of the children to solve problems without the need of an adult.

In the study of I. Nellie., I. Khaidzir., and A. M. S. Nur, (2015) "The Role of Scaffolding in Problem Solving Skills Among Children" to examine problem solving skills among children by providing scaffolding based on the needs of the children within the zone of proximal development (ZPD) and the mental scaffolding during children`s attempt to solve quantity comparison problems in a game context. The researchers revealed that problem-solving skills among children by providing scaffolding based on the needs of the children within the zone of proximal development (ZPD).

Rational of the study

World Health Organization (WHO) and National Institute of Mental Health (NIMH) gives important on life skill education. A healthy and peaceful life can be maintained through life skill education. School life is an essential part of life. This is life building stage. Physical, mental, moral, emotional, ethical i.e. an all-round development can be manifested in this stage. Problem solving skill is more important and lifeblood skill of life-skills. School age students are uplifted from one stage to another stage accordingly. At this period, depth and complexity of subjects increase. Students deal with more people like teachers, friends and take diverse roles in life. Consequently, they face more problems like family and surrounding persons expectations, good result, good behaviour, etc. To establish a healthy and peaceful life and take a right way of life and to solve deferent kind of problems, cope with deferent kinds of situations and choose better solutions of puzzles; problem solving skill is essential. So, it is necessary to developed problem solving skill among the students. Teachers, parents should take responsibilities to be aware of this skill and nourish it within the students. A number of affiliations boards, higher authorities in the field of education put much stress on problem-solving skill in school curriculum.

Research question

On the basis of contemporary studies researcher has found a wide knowledge gap on prevalence rate of problem solving skill among the students of CBSE and WBBSE board's schools. In view of the contextual knowledge gap, the following research question have been identified by the researchers-

1. What is the status of problem solving skill in CBSE and WBBSE affiliated board of schools of West Bengal?
2. What are the prevalence rate of problem solving skill among the students of CBSE and WBBSE board's schools in terms of the variables like Gender, Class, Board, Siblings, Habitat and Medium of Instruction?

Statement of the problem

Based on the findings of literature review and the broad research inquiry of existence of problem solving skill among the School Going Students, the present researchers specified and stated the problem as *"Problem Solving Skill among the School Going Students: A comparative study Between CBSE and WBBSE Board schools"*

Delimitation of the study

For the short period of time it was not possible to look after all aspects of problem therefore the study was delimited in following ground

1. Only problem-solving skill was considered.
2. Schools affiliated to CBSE and WBBSE boards only were chosen for the study.
3. Students studying in class vii, viii & ix were taken as sample of the study.
4. Only 360 students were selected as sample.

5. The variable of study was delimited to demographic variable like- affiliating board of school, Class, Gender, Sibling, Medium and Habitat.

Objective of the study

In view of the above research question and delimitation of the study the following objective were identified-

1. To compare the problem-solving skill between CBSE & WBBSE board schools.
2. To find out the problem-solving skill with respect to their Board, Class, Gender, Sibling, Medium, Habitat.
3. To implementation of problem solving skill among the students in all schools for this much aware all teachers, deference affiliations boards, higher authority of education and parents also.

Hypotheses

In keeping with the problem formulated and objectives stated earlier, the following hypotheses were proposed to be tested:

$^0H_1$: There is no significant difference between CBSE & WBBSE students in terms of their problem-solving skill.

$^0H_2$: There is no significant difference between students studying through different medium of instruction under WBBSE board in terms of their problem-solving skill.

$^0H_3$: There is no significant difference between male and female students studying under CBSE board in terms of their problem-solving skill.

$^0H_4$: There is no significant difference between male students of WBBSE board and female students of CBSE board in term of their problem-solving skill.

$^0H_5$: There is no significant difference between male students of CBSE board and WBBSE board in terms of their problem-solving skill.

$^0H_6$: There are no significant differences among the students of class VII, class VIII and class IX, in terms of their problem-solving skill.

$^0H_7$: There are no significant differences among the students from rural, semi-urban and urban areas, in terms of their problem-solving skill.

$^0H_8$: There are no significant differences among the students who has no sibling, one sibling and more than one sibling, in terms of their problem-solving skill.

$^0H_9$: There are no significant differences of problem-solving skill among the students with respect to their level of class (VII, VIII & IX) and type of board (CBSE & WBBSE), when considered together.

$^0H_{10}$: There are no significant differences of problem-solving skill among the students with respect to their habitat (Rural, Semi- urban, Urban) and type of board (CBSE & WBBSE), when considered together.

$^0H_{11}$: There are no significant differences of problem-solving skill among the students with respect to their number of sibling (No, One, more than One)and type of board (CBSE & WBBSE), when considered together.

Study design

A cross-sectional survey study was carried out among CBSE & WBBSE board schools' secondary level (vii-ix) students. Entire CBSE & WBBSE board schools' students studying in class vii, viii, & ix with in the age group of 11-15 years of the district of South 24 Pargana & Hooghly in West Bengal considered as population of the study. For this study researchers adopted convenientsampling strategy. Samples were chosen prospectively from CBSE & WBBSE board schools of South 24 Pargana and Hooghly. Total number of sample consists 360 school going secondary level students of CBSE (180) & WBBSE (180) board, studying in class vii, viii & ix. Within the samples of CBSE board schools (180) 120 were male and 60 were female students and 180 samples of WBBSE board schools were male students.

Variables: In the present study researchers wanted to find out the difference of existing problem-solving skill among the school going student based on various indicators.the following variables were identified and used.

Independent Variable - Board of affiliating (CBSE, WBBSE), Gender (Male, Female), Medium of instruction (Bengali, English), Class (VII, VIII & IX), Habitat (Rural, Semi-Urban & Urban), Siblings (No, One, More than One) were used as independent variables in the study.

Dependent Variable – In this study "problem solving skill "among the ten-core life skill was chosen as Dependent variable.

Tool: researcher has used self- made questionnaire consisted of 14 items with five possible alternatives (never, rarely, sometimes, usually, always) to measure most accurate aptitude of problem solving skill from the target students. The items of the tool are divided into two categories (positive & negative), 10 items (1, 2, 3, 4,6,7,8,9,10 &14 no question) are related into positive category and 4 items (5, 11, 12, &13 no question) are related into negative category. Scoring of the positive category question are 1,2,3,4,5 and negative category question are 5,4,3,2,1 respectively to the participant's choice of alternatives.

Data were tabulated in Microsoft Excel 2007 and analysed with the help of descriptive statistics like- mean and SD etc.and inferential statistics like- T- test, ANOVA, Factorial ANOVA using Statistical Package for the Social Sciences (SPSS) version 20.0 software. Forinferential statistics 0.05 and 0.01 level of significant was taken to analyse whether the study was significant or not.

Analysis and interpretation

Descriptive statistics and graphical presentation were used for the assessment of problem-solving skill among the students at secondary level. Parametric inferential statistics, viz. T-test, ANOVA, and Factorial ANOVA were used for predicting the problem solving skill among the higher education students under six independent variables.

Table 1: Board wise problem-solving skills among school going students.

Gender	Board	N		Mean		Std. Deviation		Std. Error Mean	
Male	CBSE	120	180	54.80	55.04	6.457	6.329	.589	.472
Female		60		55.53		6.088		.786	
Male	WBBSE	180		57.92		5.416		.404	
Total		360		56.48		6.055		.319	

It was found that though both CBSE and WBBSE board students achieved the competence on problem-solving skill WBBSE (M=57.92, S.D= 5.416) students' average score on problem-solving skill is higher than CBSE students (M=55.04, S.D= 6.329).

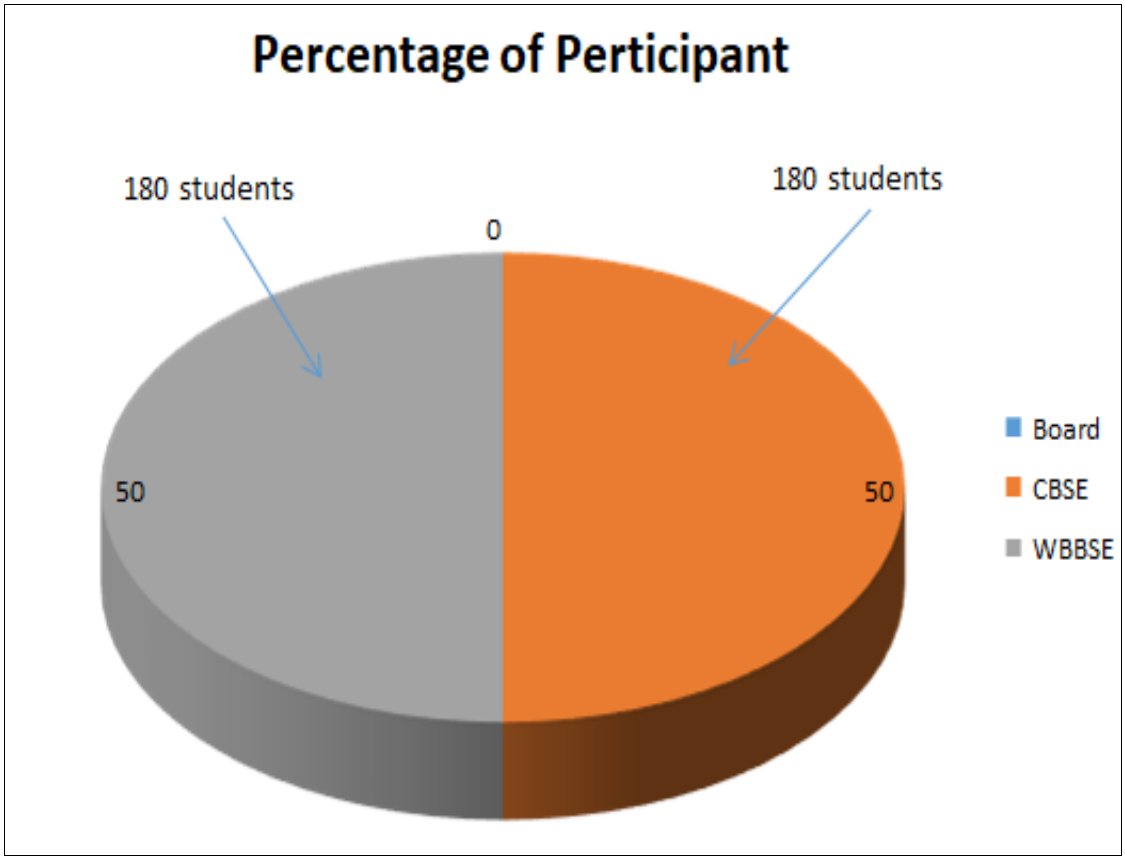

Fig 1: Pie-Chart of percentage distribution of participants.

Table 2: T-test showing the different independent variable wise comparison on problem-solving skill.

Variable	Levels	N	Mean	S.D	t-value	df	p-value	Remarks
Board	WBBSE	180	57.92	5.416	-4.626	358	.000	S*(P<0.05 level)
	CBSE	180	55.04	6.329				
Medium	Bengali	90	57.96	5.526	.096	178	.924	NS** (P>0.05 level)
	English	90	57.88	5.333				
Gender	Male	120	54.80	6.457	-.732	178	.465	NS** (P>0.05 level)
	Female	60	55.53	6.088				
Gender (Male/Female)/Board (WBBSE/ CBSE)	Male (W.B.B.S.E)	180	57.92	5.416	2.860	238	.005	S*(P<0.05 level)
	Female (C.B.S.E)	60	55.53	6.088				
Gender (male)/Board (CBSE/WBBSE)	Male(C.B.S.E)	120	54.80	6.457	-4.518	298	.000	S*(P<0.05 level)
	Male(W.B.B.S.E)	180	57.92	5.416				

*S: Significant, **NS: Not Significant.

Table 3: ANOVA showing class (VII, VIII & IX) wise comparison on problem solving skill of secondary school students.

ANOVA of class wise problem-solving skill						
Source of variable	Sum of squares	df	Mean square	F	Sig.	Remarks
Between Groups	181.422	2	90.711	2.495	.084	NS* (p>0.05 level)
Within Groups	12980.442	357	36.360			
Total	13161.864	359				

The above table shows that the calculated value of F ratio (ANOVA) is lower than the critical value of F ratio at the both level of significance i.e. no significant difference was found on problem-solving skill among the secondary level students on the basis of their class [F(2,357); 2.495, p>0.05]. Hence, it can be said that there is no significant difference on problem-solving skill among the students with respect to their (VII, VIII & IX) class.

Table 4

ANOVA of habitat wise problem-solving skill						
Source of variable	Sum of squares	df	Mean square	F	Sig.	Remarks
Between Groups	160.568	2	80.284	2.205	.112	NS* (p>0.05 level)
Within Groups	13001.296	357	36.418			
Total	13161.864	359				

Above table revealed that there is no significant difference on problem-solving skill among the students with respect to their (Rural, Semi-urban, & Urban) habitat.

Table 5

ANOVA of siblings wise problem-solving skill						
Source of variable	Sum of squares	df	Mean square	F	Sig.	Remarks
Between Groups	109.305	2	54.652	1.495	.226	NS* (p>0.05 level)
Within Groups	13052.559	357	36.562			
Total	13161.864	359				

From the above table it can be conclude that there is no significant difference on problem-solving skill among the students with respect to their (No, One & more than one) siblings.

Factorial ANOVA

Table 6

Descriptive statistics of Class & Board wise problem-solving skill				
Class of the students	**Board of the students**	**Mean**	**Std. Deviation**	**N**
VII	CBSE	54.07	5.495	80
	WBBSE	57.00	4.885	59
	Total	55.52	5.385	119
VIII	CBSE	54.28	6.104	60
	WBBSE	59.05	4.815	61
	Total	56.69	5.969	121
IX	CBSE	56.78	7.030	60
	WBBSE	57.67	6.302	60
	Total	57.23	6.663	120
Total	CBSE	55.04	6.329	180
	WBBSE	57.92	5.416	180
	Total	56.48	6.055	360

Table 7

Factorial ANOVA of class & board wise problem-solving skill						
Source	**Type III Some of squares**	**df**	**Mean Square**	**F**	**Sig.**	**Remarks**
Corrected model	1147.578	5	229.516	6.763	.000	
Intercept	1148081.337	1	1148081.337	33828.128	.000	
Class	177.437	2	88.718	2.614	.075	
Board	736.527	1	736.527	21.702	.000	
Class *Board	227.241	2	113.621	3.348	.036	
Error	12014.286	354	33.939			
Total	1161581.000	360				
Corrected total	13161.864	359				

A 3 (Class) × 2 (Board) between- subject's factorial ANOVA was calculated comparing the problem- solving score of the students who study in either one class and under either one board. The main effect for class was not significant [F (2,354) = 2.614, p>0.05]. A significant main effect for Board was found [F (1,354) = 21.702, p<0.05]. Students who study in CBSE board school has significantly lower problem-solving score (M = 55.04, sd = 6.32) than students studying in WBBSE board schools (M = 57.92, sd = 5.416). The interaction between class and Board was significant [F (2,354) = 3.348, p<0.05]. Therefore, despite of not having significant effect on students' problem-solving score alone, the effect of class was influenced by what type of board the students were studying under.

Table 8

Descriptive statistics of Habitat & Board wise problem-solving skill				
Board of the students	**Habitat of the students**	**Mean**	**Std. deviation**	**N**
CBSE	Rural	61.00	7.211	3
	Semi-Urban	51.36	9.178	25
	Urban	55.53	5.496	152
	Total	55.04	6.329	180
WBBSE	Rural	58.50	4.549	24
	Semi-Urban	57.85	6.197	66
	Urban	57.81	5.048	90
	Total	57.92	5.416	180
Total	Rural	58.78	4.790	27
	Semi-Urban	56.07	7.661	91
	Urban	56.38	5.437	242
	Total	56.48	6.055	360

Table 9

Factorial ANOVA of Habitat & Board wise problem-solving skill						
Source	**Type III sum of squares**	**df**	**Mean Square**	**F**	**Sig.**	**Remarks**
Corrected Model	1233.995	5	246.799	7.325	.000	
Intercept	261252.892	1	261252.892	7753.566	.000	
Board	87.691	1	87.691	2.603	.108	
Habitat	366.797	2	183.398	5.443	.005	
Board*Habitat	329.989	2	164.995	4.897	.008	
Error	11927.869	354	33.695			
Total	1161581.000	360				
Corrected Total	13161.864	359				

A 3(Habitat) × 2 (Board) between-subject's factorial ANOVA was calculated comparing the problem-solving score of the students who live in either Rural, Semi-Urban, or Urban and under either one board. The main effect for Habitat was significant [F (2,354) = 5.443, p<0.05]. Students who live in rural area has significantly higher problem-solving score (M= 58.78, S.d = 4.790) than students live in semi-urban (M=56.07, sd = 7.661) and urban (M = 56.38, sd = 5.437) area. The main effect for Board was found [F (1,354) = 2.603, p>0.05] to be not significant. The interaction between Habitat and Board was significant [F (2,354) = 4.897, p<0.05]. Therefore, despite of not having significant effect on students' problem-solving score alone, the effect of Board was influenced by what type of habitat the students belong to.

Table 10

Descriptive statistics of Siblings & Board wise Problem-solving skill				
Board of the students	**No siblings of the students**	**Mean**	**Std. Deviation**	**N**
CBSE	No	54.84	6.375	73
	One	54.85	6.748	86
	More than One	56.57	3.982	21
	Total	55.04	6.329	180
WBBSE	No	58.16	5.214	104
	One	57.24	5.745	67
	More than One	60.11	4.885	9
	Total	57.92	5.416	180
Total	No	56.79	5.936	177
	One	55.90	6.420	153
	More than One	57.63	4.499	30
	Total	56.48	6.005	360

Table 11

Factorial ANOVA of Siblings & Board wise problem-solving skill						
source	**Type III Sum of squares**	**df**	**Mean Square**	**F**	**Sig.**	**Remarks**
Corrected Model	878.370	5	175.674	5.063	.000	
Intercept	559959.988	1	559959.988	16137.577	.000	
Board	410.845	1	410.845	11.840	.001	
Siblings	115.339	2	57.670	1.662	.191	
Board*Siblings	20.110	2	10.055	.290	.749	
Error	12283.494	354	34.699			
Total	1161581.000	360				
Corrected Total	13161.864	359				

A3 (Number of Sibling) × 2 (Board) between-subject's factorial ANOVA was calculated comparing the problem-solving score of the students who has Zero, one or more than one siblings and study in either one board. A significant main effect for Board was found [F (1,354) = 11.840, $p<0.05$]. Students who study in CBSE board school has significantly lower problem-solving score (M = 55.04, sd = 6.32) than students studying in WBBSE board schools (M = 57.92, sd = 5.416). The main effect for siblings was not significant [F (2,354) = 1.662, $p>0.05$]. The interaction between no of siblings and Board was not significant [F (2,354) =.290, $p>0.05$]. Therefore the effect of number of siblings was not influenced by the type of board students were studying under.

Major findings

- Researchers found that the average score of problem solving skill among CBSE students (M=55.04, S.D=6.329) is lower than the score of WBBSE (M=57.92, S.D=5.416). A statistically significant difference was found on problem solving skill on the basis of Board.
- It was found that average score of WBBSE Bengali medium students (M= 57.96, S.D= 5.526) is higher than the English medium students (M=57.88, 5.333), but the difference was not statistically significant.
- No statistical significant difference was found on problem solving skill between male and female students of CBSE board but a statistically significant difference was found between WBBSE male and CBSE female students and also a statistically significant difference was found between male CBSE and male WBBSE students.
- No statistically significant difference was found among the students of class VII, VIII and IX, in terms of their problem-solving skill.
- No statistically significant difference was found among the students from Rural, Semi-urban & Urban areas, in terms of their problem-solving skill.
- No statistically significant difference was found among the students who has no sibling, one sibling and more than one siblings, in terms of their problem-solving skill
- Statistically significant interaction was found [F (2,354) =3.348, $p<0.05$] between class (VII, VIII & IX) and Board (WBBSE & CBSE).
- Statistically significant interaction was found [F (2,354) =4.897, $p<0.05$] between Habitat (Rural, Semi-urban & Urban) Board (WBBSE & CBSE).
- No Statistically significant interaction was found [F (2,354) =.290, $p>0.05$] between no of siblings (No, One, More than One) Board (WBBSE & CBSE).

Discussion and Conclusion

The major findings emerged through the present study help us to improve our understanding about the rate of prevalence of problem solving skill among the students of CBSE and WBBSE board in West Bengal with respect to their demographic variables viz-board, class, gender, medium of instruction, siblings, habitat of the students. It was found that though the average score of problem solving skill among CBSE students (M=55.04, S.D= 6.329) is lower than the score of WBBSE (M=57.92, S.D= 5.416) students both board students achieved the competence on problem-solving skill. The study showed that the effect of board on problem solving skill was statistically significant in favour of WBBSE board. This indicates that WBBSE board students demonstrate higher problem-solving skill compared with CBSE board students of West Bengal. It was observed in the study that; the problem-solving skill development is affected by so many demographic and social factors that were may or may not accounted in our day-to-day living. Making the transition from high school to university is both an exciting and challenging time for students. As intelligence is crucial for living, problem solving is also very important for healthy living. Therefore, every student should develop their problem-solving skill as perindividual capacity. Society and educational institution should come forward and join hands in between to provide opportunity and experiences that will help the students develop problem-solving skill better than ever. This should be our conclusion to this study.

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