ATTITUDE TOWARDS LEARNING DIFFICULTY IN CHEMISTRY AND ACADEMIC ACHIEVEMENT IN CHEMISTRY AMONG SCHOOL STUDENTS

[1]V.G. Sivagami and [2]Dr.M.Balamurugan

[1]Ph.D., Scholar,School of Education, Pondicherry University, Pondicherry-605014, India
[2]Professor, School of Education, Pondicherry University, Pondicherry-605014, India

ABSTRACT

There is a gap between what is actually projected in the national curriculum and what actually happens in the classroom where students learn Chemistry. There are several reasons contributing to students' failure to engage in meaningful learning in chemistry classrooms. But, the main hurdle lies in students' inability to demonstrate a good understanding of very basic concepts of the subject.The students' learning difficulties in chemistry, sometimes does not give the true picture of a given situation because it can be affected by classroom instruction, lack of parental care, lack of motivation and exercise from the teachers side. It is thus necessary to make an effort to study the students'attitude towards learning Chemistry and learning difficulties in Physical, Organic and Inorganic Chemistry. This study was conducted under normative survey method in Puducherry region. The 355 samples were drawn from the school students. The results revealed that the, 'attitude towards learning difficulty in chemistry' is equal to the attitude towards 'Learning Easy' among the school students. The Boys and Girls students differ in their 'Attitude towards Learning Difficulty' and 'Learning Easy' in Chemistry'. But the mixed group of Boys and Girls does not have any significant difference.The Academic Achievement of Inorganic Chemistry is higher than the 'Organic and Physical Chemistry'.The Boys and Girls students differ in their total Academic Achievement in chemistry and the branches of 'Organic and Physical Chemistry. But they do not differ in their Academic Achievement of 'Inorganic Chemistry'

Keywords: Attitude towards Learning Easy, Learning Difficulty(LD) and Academic Achievement in Chemistry

1.INTRODUCTION

Chemistry relies on logical thought, accuracy and an ability to understand mental concepts. There is a heavy use of symbols, numbers and equations to represent chemicals and reactions, which have to be balanced. A lack of basic understanding or high inaccuracy rate can cause students to lose confidence and feel upset and depressed. Students bring different talents for learning the subject like Chemistryinto the classroom. It is important for science teachers to note that the attitude of students' can strongly influence their learning. Chemistry has been recognized as a central science in school curriculum and therefore it is important for the development of a national

education system. The incessant poor performance of students in chemistry especially at national and international examinations needs pro-active attention. The high rate of failure has troubled students from furthering their education in science leading to a gradual success of science education. Many researches have indicated that students have difficulty in learning in one branch of chemistry and find it easy in other branches of chemistry like Physical, Organic and Inorganic chemistry. This feature has persisted in educational researches.

SIGNIFICANCE OF THE STUDY

Learners in any classroom differ from one another in some respects; some are 'normal' students and others are 'special' students. Arguably, today's science classrooms are witnessing a situation in which students experience a special learning need during the course of their learning science.

*Corresponding author **Dr.M.Balamurugan**, Professor, School of Education, Pondicherry University, Pondicherry-605014, India*

Unfortunately, most of the science teachers are not effective in designing instruction to suit struggling learners. Therefore, this category of learners ends up as repeaters or pushed-outs. Thus, this study has made an attempt to provide a platform for examining the learners in regular chemistry classrooms for their difficulty level or easy level of understanding chemistry and their output respectively.

REVIEW OF STUDIES

The learning difficulties for new entrant chemistry students from multi-national, regional, tertiary education institutions in the South Pacific were investigated using a purpose-designed diagnostic instrument. The instrument contained 25 items distributed across three themes: scientific reasoning, numeracy and scientific language literacy. The research findings suggest that the main learning difficulty facedby these students being able to interpret numerical data presented in graphical form and to complete rudimentary numerical calculations, but unable to use numerical data or perform calculations involving ratios. Targeted remedial tutoring, based on the results of this diagnostic test instrument, rather than content driven extra tutorials, are suggested for remediation of learning difficulties (Okanlawon, Ayoade Ejiwale, 2017)

Students in a science classroom vary greatly and today's teachers are inattentive to students' varied learning needs (Avramidis and Kalyva, 2007). Increasing students' variance often described as disparity in skills and knowledge, present huge challenges for teachers employed to teach science. Consequently, competencies for adaptive instruction are an important part of every teacher's repertoire (Cole, et al., 2000; Tomlinson, 2001). It is this competence that people questioned when students failed to perform well in science. A large amount of research has shown that the extent to which teachers differentiate, or ways with which they adjust instruction to help students learn information, remember it, and demonstrate that they have learnt it, strongly affects the achievement of their students (Gregory & Chapman, 2002).When adaptations are provided to students who are not getting the lesson content or not learning important skills from lessons designed for most students in the traditional classroom, research shows two things: curricular adaptations reduce problem behaviours, and then maximize student participation and success (Cole, 2000).

In comparing the perception and actual students' learning difficulties in Physical Chemistry, many areas of physical chemistry where students perceived no difficulty is actually difficult for them to solve. It was recommended among other things, that students' perceived difficulty should not be used as the basis for understanding the learning diffculties in Electrolysis (Francis A. Adesoji, Nathaniel Ayodeji Omilani, Sakin Olanrewaju Dada, 2017).Due to gaps in students' understanding of fundamental concepts, they are unable to engage in in-depth learning of advanced level content(Takbir Ali, 2012).The other studies emphasize the inherent link between students' prior knowledge and new knowledge (Mayhill &Brackley, 2004).When teachers and students gave suggestions on how to improve the relevance of chemistry education at upper secondary level, more

laboratory work and connections to everyday life is the most common proposals (Karolina Broman, Margareta Ekborg and Dan Johnels, 2011). But on the whole, these students seem quite satisfied with their chemistry courses (Richard Kevin Coll and David Rohindra, 2006).

Most of the learner participants enjoyed Organic Chemistry and found it interesting, the majority found it difficult to learn and understand. The learners' attitude to organic chemistry was compared with their actual level of understanding. This comparison revealed some disparity.The teachers showed a relatively accurate perception of the learners' experience of organic chemistry. There were different reasons why teachers and learners identified topics as easy or difficult to teach or learn respectively. This result provides a novel contribution to existing literature by investigating teachers' and learners' perspectives (Anne O' Dwyer and Peter E Childs, 2017).

RESEARCH QUESTIONS

1. Why students' attitude shows different types of performance in Learning Chemistry?
2. How the Achievement in Chemistry differs among the Higher Secondary Students with respect to branches of Physical Chemistry, Organic and Inorganic Chemistry?
3. How the relationship between 'Learning Difficulty Attitude in Chemistry'and 'Academic Achievement in Chemistry'is high or low performance among the Higher Secondary Students?

DEFINITIONS

Definition of Learning Difficulty

A person with a learning difficulty may be described as having specific problems processing certain forms of information. Learning difficulty does not affect general intelligence (IQ). An individual may often have more than one specific learning difficulty and other conditions may also be experienced alongside each other (Mental Health Foundations, Scotland). Learning difficulty in chemistry is the poor capability to learn and understand the subject to complete the task on time.

Definition of Learning Easy

Educational researchers agree that learning is much deeper than memorization and information recall. Deep and long-lasting learning involves understanding, relating ideas and making connections between prior and new knowledge, independent and critical thinking and ability to transfer knowledge to new and different contexts. In other words learning is a modification of behaviour by experience (Mariam Webster). Learning Easy is the behaviour of learning and understanding the subject easily with right approach on time.

OBJECTIVES

1. To study the status of students' Attitude towards Learning Difficulty in Chemistry.

2. To study the status of Academic Achievement in Chemistry among the higher secondary students with respect to Physical, Organic and Inorganic Chemistry?

3. To study the mean difference on 'Attitude towards Learning Difficulty in Chemistry' among the school students with respect to the demographic variables such as
   a) Gender
   b) Locality of the School and
   c) Parental Income

4. To study the mean difference in Academic Achievement of Chemistry among the school students with respect to the demographic variables
   a) Gender
   b) Locality of the School
   c) Parental Income

5. To study the relationship between 'Attitude towards Learning Difficulty in Chemistry' and 'Academic Achievement in Chemistry' among the Higher Secondary Students.

2.METHOD OF STUDY

The present study was conducted by the investigator using Normative Survey Method. The normative survey method uses statistics and values considered normal for the group being surveyed to understand and collect data on a specific subject. The normative survey method is sometimes referred to as descriptive research as well. All the information gathered in this type of survey should always be compared to the social norms for the group being surveyed and tested with considerable large number of sample.

SAMPLE AND SAMPLING TECHNIQUES

The samples were selected by using simple random sampling technique. Simple random sampling is a sampling technique where every item in the population has an even chance and likelihood of being selected in the sample. Here the selection of items completely depends on chance or probability and therefore this sampling technique is also sometimes known as a method of chances. This process and technique is known as simple random sampling and it is a fair sampling technique.The sample of the study consists of 355 Higher Secondary Students studying Chemistry as one of the specialization papers at their higher secondary second year level in PondicherryRegion. The sample size of Boys consists of 153 and Girls 202.

INSTRUMENTS AND DESCRIPTION

The instrument contains three sections, A) comprises of the personal and school related information of the respondent, B) 'Attitude towards Learning Difficulty in Chemistry' and C) 'Academic Achievement in Chemistry'.

B) Attitude towards Learning Difficulty in Chemistry

The investigator used a tool 'Attitude towards Learning Chemistry for this study.This attitude scale developed by the investigator V.G.Sivagami and Prof.M.Balamurugan with the aim of using it for Higher Secondary Students in Pondicherry region.It consists of two factors namely a) Attitude toward Learning Easy and b) Attitude Towards Learning Difficulty. The development and item analysis of the tool was carried out by Try-out and Pilot Study using simple random sampling technique consisting 355 higher secondary students studying Chemistry at second year level as one of the specialization paper. At the pilot study stage, this scale consists of 30 Likert Type items with four point rating scale.After the item analysis of goodness of fit followed by Chi- square test (equal probability distribution), the final tool consists of 21 items with the scoring techniques of 4, 3, 2 and 1 for Strongly Difficulty(SD), Difficulty(D), Easy (E) and Very Easy (VE) respectively. All the 21items are positive items. The maximum scores of final tool consistof 84 and the minimum of 21.The age norms of the test has been suitable for the age group of 16 to 18 years old school students.The reliability of the ATLDC scale was established by using Cronbach's Alpha method (internal consistency of each item with total item) and the reliability value is 0.87.

C) Academic Achievement Test in Chemistry

The tool 'Academic Achievement Test in Chemistry' was used by the investigator. This instrument was developed by the investigator V.G.Sivagami and Prof.M.Balamurugan with the aim of using it for higher secondary students in Puducherry region. It is applicable for the students studying chemistry as one of the course papers recognized by the School Board at Higher Secondary level in the Government of Tamilnadu and Pondicherry. These items are suitable based on the syllabus at higher secondary course given in the Text book with respect to the chapters of Organic, Inorganic and Physical Chemistry.

The Academic Achievement Test in Chemistry consists of multiple choice items with four options. The best one among the four is the correct answer. This test was developed by using Try-out and Pilot Study.The Pilot Study consists of 42 items.After the systematic procedures and identification of 'Difficulty Index' and 'Discriminating Power' of the items, the test retained only 30 items for the final applications of the samples selected for this study. The scoring procedures of the test consists of 1(one) point for each correct response among the four options of each item**.** The maximum score of the tool consists of 30. The high score indicate high achievement.The age norm of the test has been suitable for the age group of 16 to 18 years old school students.This tool endures the characteristics of experts' opinion and therefore it satisfies the face and content validity. The reliability of the tool was established by Split- Half method and the reliability value is 0.93,significant at 0.01 level.

3.ANALYSIS AND INTERPRETATIONS

This study analysed the collected 355 data by using the descriptive, differential and correlation analyses. The description and inferences are given below,

Table-1 Descriptive Analysis of Attitude towards LD inChemistry among the Higher Secondary Students

Attitude towards LD in Chemistry	N	Max. Score	Mean	SD
Attitude Towards Learning Difficulty in Chemistry	355	80	18.46	13.02
Attitude Towards Learning Easy in Chemistry	355	44	18.85	07.51
Total Attitude Towards Learning Chemistry	355	80	37.32	11.30

The mean and standard deviation of the 'Attitude towards Learning-Difficulty in Chemistry (ATLDC)' is 18.46 and 13.02, respectively. The mean and standard deviation of the Attitude towards Learning- Easy in Chemistry (ATLEC) is 18.85 and 07.51 respectively. Therefore, the mean score of the 'learning difficulty' and'learning easy' are in same status in Chemistry among the higher secondary students. But the standard deviations vary in both difficulty and easy. Hence there is a considerable deviation when the students have Easy and Difficulty in their learning performance of Chemistry among the higher secondary students. Similarly the mean score of ATLC is 18.46 and the mean score of ATLEC is 18.85. Therefore the entire attitude towards learning difficulty in Chemistry is in the equal status of 'Learning Easy' and 'Learning Difficulty(Table-1).

Table-2 Descriptive Analysis of Academic Achievement in Chemistry among Higher Secondary Students

Academic Achievement in Chemistry	N	Max. Score	Mean	SD
Academic Achievement of Organic Chemistry	355	10	5.81	2.72
Academic Achievement of Inorganic Chemistry	355	10	7.41	2.26
Academic Achievement of Physical Chemistry	355	10	6.16	2.34
Total Academic Achievement in Chemistry	355	30	19.39	6.22

The mean and standard deviation of the 'Academic Achievement in Organic Chemistry' is 5.81 and SD is 2.72, respectively. The mean and standard deviation of Inorganic Chemistry is 7.41 and 2.26, respectively. The Mean and Standard Deviation of Physical Chemistry is 6.16 and 2.34, respectively.Similarly, the mean and Standard Deviation of Total Academic Achievement in Chemistry is 19.39 and 6.22, respectively. Therefore it indicates that with reference to the mean score, the total Academic Achievement of Chemistry is 64.63 % and the Academic Achievement of Organic Chemistry is 58.10 %, Inorganic Chemistry is 74.10 % and Physical Chemistry is 61.6%. Hence the school students' Academic Achievement in Inorganic Chemistry is higher than the Organic and Physical Chemistry(Table-2).

Table-3 (t-Test) Mean Difference in Attitude towards LD in Chemistry among Higher Secondary Studentswith respect to Gender

Attitude towards Learning Chemistry	Gender	N	Mean	SD	df	t-value	Sign. at 0.01 l (p-value)
Attitude towards Learning Difficulty in Chemistry	Boys	153	20.71	16.34	353	2.86	S (0.00)
	Girls	202	16.76	09.47			
Attitude Towards Learning Easy in Chemistry	Boys	153	16.49	8.99	353	5.35	S (0.00)
	Girls	202	20.64	5.56			
Total Attitude Towards Learning Chemistry(	Boys	153	37.20	13.93	353	0.16	NS (0.87)
	Girls	202	37.40	8.84			

S- Significant

The mean and Standard Deviation of the Learning Difficulty Attitude in Chemistry among the Boys and Girls is (20.71, 2.86) and (16.76, 9.47) respectively and the respective t-value is 2.86, which is significant at 0.01 level. Hence the Boys and Girls differ in their learning difficulty in Chemistry.The mean and Standard Deviation of the Attitude towards Learning Easy in Chemistry among the Boys and Girls is (16.49, 8.99) and (20.64, 5.56) , respectively and the respective t-value is 5.35, which is significant at 0.01 level. Hence the Boys and Girls differ in their Attitude towards Learning Easy in chemistry (Table-3).

The mean and Standard Deviation of the entire sample of Boys and Girls in their total Attitude towards Learning Difficulty in Chemistry is (37.20, 13.93) and (37.40, 8.84), respectively and the respective t-value is 0.16, which is not significant at 0.01 level. Hence the Boys and Girls do not differ in their total Attitude towards Learning Difficulty in Chemistry. Therefore the mixed group of Boys and Girls of this study does not have any significant difference in their total Attitude towards Learning Difficulty in Chemistry (Table-3).

Table-4 (t-Test)Mean Difference in Academic Achievement inChemistry Among Higher Secondary Students with respect to Gender

Academic Achievement in Chemistry	Gender	N	Mean	SD	df	t-value	Sign. at 0.01 (p-value)
Academic Achievement in Organic Chemistry	Boys	153	6.51	2.88	353	4.34	S (0.00)
	Girls	202	5.27	2.48			
Academic Achievement in Inorganic Chemistry	Boys	153	7.55	2.46	353	1.04	NS (0.29)
	Girls	202	7.30	2.09			
Academic Achievement in Physical Chemistry	Boys	153	6.88	2.54	353	5.22	S (0.00)
	Girls	202	5.62	2.01			
Total Academic Achievement in Chemistry	Boys	153	20.96	6.86	353	4.23	S (0.00)
	Girls	20	18.20	5.41			

S- Significant

The mean and standard deviations of 'Academic Achievement in Organic Chemistry 'among the Boys and Girls is (6.51, 2.88) and (5.27, 2.44), respectively and the respective t- value is 4.34 which is significant at 0.05 level. The mean and standard deviation of the Academic Achievement of Inorganic Chemistry among the Boys and Girls is (7.55 and 2.46) and (7.30, 2.09), respectively and the respective t- value is 0.29, which is not significant at 0.05 level. The mean and standard deviation of the 'Academic Achievement of Physical Chemistry' among the boys and girls is (6.88, 2.54) and (5.62, 2.01),respectively and the respective t- value is 5.22, which is significant at 0.05 level. The mean and standard deviation of 'Total Academic Achievement in Chemistry'among the Boys and Girls is (20.96, 6.86) and (18.20, 5.41), respectively and the respective t- value is 4.23, which is significant at 0.05 level. Therefore it indicates that the boys and girls differ in 'Total Academic Achievement in Chemistry'and the branches of Organic and Physical Chemistry. But they do not differ in their'Academic Achievement of Inorganic Chemistry(Table-4).

Table-5(t-Test)
Mean Difference in Attitude towards LD in Chemistry Among Higher Secondary Students with respect to Locality

Attitude towards LD in Chemistry	Gender	N	Mean	SD	df	t-value	Sign. at 0.01 Level (p-value)
Learning Difficulty Attitude in Chemistry	Urban	290	18.43	13.17	353	0.61	NS (0.55)
	Rural	65	19.70	6.14			
Learning Easy Attitude in Chemistry	Urban	290	18.83	7.56	353	0.34	NS (0.73)
	Rural	65	19.50	6.00			
Total Attitude Towards Learning Difficulties in Chemistry	Urban	290	37.26	11.41	353	0.53	NS (0.59)
	Rural	65	39.20	6.74			

NS- Not Significant

The mean and Standard Deviation of the Attitude towards Learning Difficulty in Chemistry among the students from Urban and Rural area is (18.43, 13.17) and (19.70, 6.14), respectively and the respective t-value is 0.61, which is not significant at 0.01 level. Hence the Urban and Rural students do not differ in their learning difficulty in Chemistry. The mean and Standard Deviation of the Attitude towards Learning Easy in Chemistry among the Urban and Rural area student is (18.83, 7.56) and (19.50, 6.00), respectively and the respective t-value is 0.34, which is not significant at 0.01 level. Hence the Urban and Rural area students do not differ in their Attitude towards Learning Easy in Chemistry.Similarly, the mean and standard deviation of the entire students or samples' Attitude towards Learning Chemistry among the Urban and Rural area is (37.26, 11.41) and (39.20, 6.74), respectively and the respective t-value is 0.534 which is not significant at 0.01 level. Hence the Urban and Rural area students do not differ in their 'Attitude towards Learning Difficulty in Chemistry' (Table-5).

Table-6(t-Test)Mean Difference in Academic Achievement of Chemistry Among Higher Secondary Students with respect to Locality

Academic Achievement in Chemistry	Locality	N	Mean	SD	df	t-value	Sign. at 0.01 (p-value)
Academic Achievement of Organic Chemistry	Urban	290	5.81	2.73	353	0.23	NS (0.80)
	Rural	65	5.60	2.75			
Academic Achievement of Inorganic Chemistry	Urban	290	7.42	2.24	353	0.87	NS (0.38)
	Rural	65	6.80	2.85			
Academic Achievement of Physical Chemistry	Urban	290	6.16	2.35	353	0.32	NS (0.75)
	Rural	65	6.40	1.89			
Total Academic Achievement in Chemistry	Urban	290	19.40	6.22	353	0.31	NS (0.76)
	Rural	65	18.80	6.51			

NS- Not Significant

The mean and standard Deviations of Academic Achievement in Organic Chemistry among the Urban and Ruralarea students is (5.81, 2.73) and (5.60, 2.75),respectively and the respective t-value is 0.23 which is not significant at 0.01 level. The mean and standard deviation of Academic Achievement in Inorganic Chemistry among the Urban and Rural area students is (7.42, 2.24) and (6.80, 2.84), respectively and the respective t- value is 0.87, which is not significant at 0.01 level. Similarly, the mean and standard deviation of the Physical chemistry among the Urban and Rural area students is (6.16, 2.35) and (6.40, 1.89), respectively and the respective t- value is 0.32, which is not significant at 0.01 level. The mean and standard deviation of 'Total Academic Achievement in Chemistry among the Urban and Rural area students is(19.40, 6.22) and (18.80, 6.51), respectively and the respective t- value is 0.31, which is not significant at 0.01 level. Therefore it indicates that the students from Urban and Rural area do not differin Total Achievement in Chemistry and its branches namely, Organic, Inorganic and Physical Chemistry (Table-6).

Table-7 (F-Test)
Mean Difference in Attitude towards LD in Chemistry among Higher Secondary Students with respect to Parental Income

Attitude Towards LD in Chemistry	Division	Sum of squares	df	Mean Square	F-value	Sign. at 0.01 (p-value)
Learning Difficulty Attitude in Chemistry	Between Groups	4176.54	3	1392.18	8.74	S (0.00)
	Within Groups	55851.83	351	159.122		
	Total	600283.37	354			
Learning Easy Attitude in Chemistry	Between Groups	1656.38	3	552.12	10.56	S (0.00)
	Within Groups	18343.99	351	52.26		
	Total	20000.38	354			
Total Attitude Towards Learning Chemistry	Between Groups	610.85	3	203.61	1.61	NS (0.19)
	Within Groups	44652.52	351	127.21		
	Total	45263.39	354			

S- Significant

The differential analysis shows, the Attitude towards Learning Chemistry among the school students with respect to their parental income (four economic ranges) is significant at 0.01 level for the respective F- value is 8.74 for df(3, 351). The Learning Easy Attitude in Chemistry among the students with respect to their parental income is significant at 0.01 level for the respective F- value is 10.56 for df(3, 351).The entire students Attitude towards Learning Chemistry with respect to their Parental Income is not significant at 0.01 level for the respective F- value is 1.61 for df(3, 351). Hence, it is concluded that the school students differ in their 'Learning Difficulty' and 'Learning Easy Attitude' in Chemistry with respect to their 'Parental monthly income (four economic ranges)' but they do not differ in their 'Attitude towards Learning Chemistry' (Table-7).

Table-8(F-Test)
Mean Difference in Academic Achievement in Chemistry among Higher Secondary Students with respect to Parental Income

Academic Achievement in Chemistry	Division	Sum of Squares	df.	Mean Square	F-Value	Sign. at 0.05 (p-value)
Academic Achievement of Organic Chemistry	Between Groups	97.41	3	32.47		S (0.00)
	Within Groups	2536.94	351	7.22	4.493	
	Total	2634.35	354			
Academic Achievement of Inorganic Chemistry	Between Groups	64.28	3	21.42		S (0.00)
	Within Groups	1745.67	351	4.97	4.308	
	Total	1809.95	354			
Academic Achievement of Physical Chemistry	Between Groups	48.96	3	48.96	3.027	S (0.03)
	Within Groups	1892.89	351	1892.89		
	Total	1941.85	354			
Total Academic Achievement in Chemistry	Between Groups	555.99	3	185.33		S (0.00)
	Within Groups	12128.58	351	37.43	4.951	
	Total	13694.57	354			

S- Significant

The Academic Achievement of 'Organic Chemistry'with respect to the Parental Income of the school students (four economic ranges) is significant at 0.01 level for the respective F- value is 4.49 for df(3, 351). The Academic Achievement of 'Inorganic Chemistry'with respect to the 'parental income' of the school students is significant at 0.01 level for the respective F- value is 4.30 for df(3, 351). The Academic Achievement of 'Physical Chemistry'with respect to the 'parental income' of the school students (four economic range of categorical variable) is significant at 0.01 level for the respective F- value is 3.02 for df(3, 351). The total Academic Achievement of Chemistry'with respect to the 'Parental Income' of the school students is significant at 0.01 level for the respective F- value is 4.95 for df(3, 351). Hence, it is concluded that, the branches of Academic Achievement in chemistry namely Organic, Inorganic and Physical Chemistry differ among the higher secondary school students with respect to their parental income. Therefore the entire students differ in their Academic Achievement in Chemistry with respect to their 'Parental Income (Table-8).

Table-9
Relationship between Academic Achievement in Chemistry and Attitudes towards LD in Chemistry
(Pearson Product Moment Correlation)

Academic Achievement of Chemistry	Attitude Toward LD in Chemistry		
	Learning Easy	Learning Difficulty	TATLDC
Organic Chemisry	0..222**	-0.133	-0.006
Inorganic Chemisry	0.119*	-0.103	-0.040
Physical Chemisry	0.150**	-0.057	0.034
T AAC	0.197**	-0.117*	-0.004

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
TATLDC-Total Attitude towards LD in Chemistry
TAAC-Total Academic Achievement in Chemistry

The relationship between 'Academic Achievement of 'Organic Chemistry' and 'Attitude towards Learning Easy in Chemistry'is 0.222 which is positive low relationship and significant at 0.05 level. Similarly, the relationship between 'Total Academic Achievement in Chemistry and 'Attitude towards Learning Easy in Chemistry' is 0.197, and Total Academic Achievement and Inorganic Chemistry is 0.119, and Total Academic Achievement and Physical Chemistry is 0.150, which are positive negligible relationship and significant at 0.05 level. Whereas, the relationship between 'Academic Achievement in Organic Chemistry' and 'Attitude towards Learning Difficulty in Chemistry' is -0.133 which is negative negligible relationship not significant at 0.05 level. Similarly, the relationship between 'Inorganic and Physical Chemistry' and 'Attitude towards Learning Easy in Chemistry' is, -0.103 and -0.057, respectively, which are negative low relationship and not significant at 0.05 level. The 'Total Academic Achievement of Chemistry' and'Attitude towards Learning Difficulty in Chemistry' is -0.117,which is negative negligible relationship and significant at 0.05 level. Hence it is concluded that, when the students attitude becomes 'Learning Easy in Chemistry' their 'Total Academic Achievement In Chemistry' and its branches of Organic, Inorganic and Physical Chemistry have positive low relationship. On the other side if their attitude become, learning difficulty then their Total Academic Achievement in Chemistry and its branches of Organic Chemistry, Inorganic and Physical Chemistry have negative negligible relationship (Table-9).

4.DISCUSSION

A nation that is aspiring to produce scientifically literate individuals must ensure that effective teaching of science manifests in the classrooms. To clear the learning difficulty for the students studying in the schools they must undergo a good planning of the subject with the relevant content unit wise division. Learners must use the teachers' tutorial session for revision or drilling the difficult part with enough resources and relevant materials. The difficulty level of the content may be reduced successfully by the learners with enough motivation from the teacher side and energy stimulant from the dietician as well as the playground exercises or playing activities. Teachers must use power point presentation and animation as teaching aids for the concerned subjects till they get the expected outcome from the child in the subject with frequent time interval. It is also suggested that the teacher and

parent should provide the platform to the learning difficulty students to listen patiently to the needs of the children. The teachers should avoid emotional reaction while meeting the children or attending to the children with learning difficulty. Difficulty is a kind of temporary mental blocks that gives panic and anxiety to the students. For any subject or specific subject like Chemistry, the teacher tries their own unique remedial tactics and instructional strategies to engage students in meaningful learning process. These strategies include using examples, analogies, questioning, cues and probing, and prompting; offering alternative explanation; supplying information to fill knowledge gaps; reinforcing key points; and backtracking.

5. CONCLUSION

The 'Attitude towards Learning Difficulty in Chemistry' is in equal status of 'Attitude towards Learning Easy' among the school students. There are multiple reasons contributing for students' failure to engage in meaningful learning in Chemistry class rooms. The main hurdle lies in the students' inability to demonstrate a good understanding of very basic concepts of the subject. (Takbir Ali, 2012). The Boys and Girls students differ in their 'Attitude towards Learning Difficulty in Chemistry' and 'Attitude towards Learning Easy in Chemistry'. But the mixed group of Boys and Girls students of this study does not have any significant difference in their 'Attitude towards Learning Chemistry'. The students from Urban and Rural area do not differ in their 'Attitude towards 'Learning Difficulty' and 'Attitude towards Learning Easy in Chemistry'. Similarly they do not differ in their 'Total Attitude towards Learning Difficulty in Chemistry with respect to their 'Parental Monthly Income'.

This study revealed that, the school students' Academic Achievement in Inorganic Chemistry is higher among the other branches of 'Organic and Physical Chemistry'. The Boys and Girls students differ in their 'Total Academic Achievement in Chemistry', and the branches of 'Organic and Physical' Chemistry. But they do not differ in their 'Academic Achievement of Inorganic Chemistry'.The students from Urban and Rural areas do not differ in their 'Total Academic Achievement in Chemistry'and its branches likeOrganic, Inorganic and Physical Chemistry. But most of the learner participants enjoyed 'Organic Chemistry'and found it interesting, the majority found it difficult to learn and understand.The learners' Attitude towards Organic Chemistry was compared with their actual level of understanding (Anne O' Dwyer and Peter E Childs, 2017).

The Higher Secondary Students'total Academic Achievement in Chemistry and its branches such as Organic, Inorganic and Physical Chemistry differ with respect to their Parental Income. According to Okanlawon, Ayoade Ejiwale(2017) the main learning difficulty faced by these students is in numeracy with students able to interpret numerical data presented in graphical form and to complete rudimentary numerical calculations, but unable to use numerical data or perform calculations involving ratios. Targeted remedial tutoring, based on the results of this diagnostic test instrument, rather than content driven extra tutorials suggested for remediation of Learning difficulties.

Considering the relationship of the attitude and Academic achievement, if the students' attitude becomes 'Learning Easy', then their total Academic Achievement in Chemistry and the branches like,Organic Chemistry, Inorganic and Physical Chemistry has positive low relationship. On the other hand if their attitude becomes 'Learning Difficulty' then their total academic achievement in Chemistry and its branches like,Organic Chemistry, Inorganic and Physical Chemistry have negative relationship.

6.ACKNOWLEDGEMENT

7.REFERENCES

Anne O' Dwyer and Peter E Childs (2017*). Who Says Organic Chemistry is Difficult? Exploring Perspectives and Perceptions.EURASIA Journal of Mathematics,Science & Technology Education,* ISSN: 1305-8223 *Vol.13*, No.2, pp.3599-3620.

Avramidis, E and Kalyva, E. (2007). The influence of Teaching Experience and   Professional special Needs Education, Vol.22 (4) pp.367- 389.

Cole, S., et al (2000). Adapting Curriculum and Instruction in Inclusive Classrooms: A Teacher's desk. Bloomington, IN: Institute for the study of Developmental Disabilities.

Francis A.Adesoji , Nathaniel Ayodeji Omilani , Sakin Olanrewaju Dada (2017), A Comparison of Perceived and Actual; Students' Learning Difficulties in Physical Chemistry, International Journal of Brain and Cognitive Science, Vol.6, Issue-1, Scientific and Academic Publishing, pp.1-8.

Gregory, G and Chapman, C (2002). Differentiated Instructional Strategies: One size Doesn't fit all. Thousand Oaks, CA: Corwin press.

Karolina Broman, Margareta Ekborg and Dan Johnels (2011), Chemistry in crisis? Perspectives on teaching and learning chemistry in Swedish upper SecondarySchools. Research Gate, NORDINA, Vol, 7, Issue-1, pp.43-60,

Melaku MasreshaWoldeamanuel, Harrison Atagana and TemechegnEngida (2014) What Makes Chemistry Difficult? African Journal of Chemical Education, Vol. 4(2), Special Issue (Part- I). ISSN: 2227-5835.

Mayhill and Brackley (2004)Making connections: Teachers' use of children's prior Knowledge in whole class discourse**.**British Journal of Educational Studies. 52(3):pp 263 – 275.

Okanlawon, Ayoade Ejiwale (2017) Teaching Chemistry to Students with Learning Difficulties: Exemplary Adaptive Instructional Practices of Experienced Teachers. Academic Journal Article, Ife, Psychologia. Vol.25, Issue-2, p.262.

Richard Kevin Coll and David Rohindra (2006) Investigating First-Year Chemistry Learning Difficulties in the South Pacific: A Case Study from Fiji. International journal of Science and Mathematics Education, Vol.4, Issue-3, pp.365-390.

Tomlinson, C.A. (2001). How to Differentiate Instruction in Mixed Ability Classrooms. Association for Supervision and Curriculum Development, Alexandria, Virginia.

Takbir Ali (2012) A Case Study of the Common Difficulties Experienced by High School Students in Chemistry Classroom (Gilgit Baltistan,Pakistan).SAGE Open Access Journal, June Issue 2012: pp1–13,

*****