ATTITUDE OF SENIOR SECONDARY SCHOOL STUDENTS TOWARDS E-LEARNING IN SIKKIM

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By

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CHAPTER 3

ANALYSIS AND INTERPRETATION OF DATA

The present study aimed at studying the attitude of senior secondary school students towards e-learning. In order to achieve this objective, a sample of 400 students studying in XI classes comprising 200 boys and 200 girls belonging to arts and science stream was drawn from eight government senior secondary schools and eight private senior secondary schools situated in East district of Sikkim. An Attitude Scale towards e-Learning developed and standardized by Dimpal Rani was administered to the selected sample in order to collect the requisite data as discussed in Chapter 2. The data available on the selected variables were tabulated, analyzed and interpreted in the following manner.

3-1 Statistical Techniques Used

1) The objective number 1 aims at studying the nature of distribution of scores of selected samples of government and private senior secondary school boys and girls as well as total sample on the variable of attitude towards e-learning. Hence, the technique of frequency distribution followed by bar and line diagrams was used in this case.
2) The objective number 2 aims at to compare the mean scores on the attitude of senior secondary school students towards e-learning with respect to their gender, stream, locality and types of school. Hence the technique of t-test was used in this case.

3-2 Analysis of Data

The data gathered from the sampled students was analyzed objective-wise using the relevant statistical techniques specified above. The detail of the analyses of data collected from the selected sample on the variable of e-Learning is presented as under.

3-2.1 Studying the Nature of Distribution of Scores

3-2.1.1 e-Learning among Senior Secondary School Students with respect to gender

A. Distribution of Scores for Male Senior Secondary School Students on the Variable 'e-Learning'

The distribution of scores for male senior secondary school students on the variable 'e-Learning' is given in Table 3.1.

Table 3.1: Distribution of Scores for Male Secondary School Students on the variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
300-319	3	1.50	100.00
280-299	4	2.00	98.50
260-279	14	7.00	96.50
240-259	39	19.50	89.50
220-239	56	28.00	70.00
200-219	54	27.00	42.00
180-199	28	14.00	15.00
160-179	1	0.50	1.00
140-159	0	0.00	0.00

120-139	0	0.00	0.00
100-119	1	0.50	0.50
Total	**200**	**100**	**100**

Highest Score = 313

Lowest Score = 117

Range = 196

B. Distribution of Scores for Female Senior Secondary School Students on the Variable 'e-Learning'

The distribution of scores for female senior secondary school students on the variable 'e-Learning' is given in Table 3.2.

Table 3.2: Distribution of Scores for Female Senior Secondary School Students on the Variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
300-319	0	0.00	00.00
280-299	6	3.00	100.00
260-279	15	7.50	97.00
240-259	49	24.50	89.50
220-239	81	40.50	65.00
200-219	38	19.00	24.50
180-199	11	5.50	5.50
160-179	0	0.00	0.00

140-159	0	0.00	0.00
120-139	0	0.00	0.00
100-119	0	0.00	0.00
Total	**200**	**100**	**100**

Highest Score = 295

Lowest Score = 180

Range = 115

C. Distribution of Scores for Total Sample of Senior Secondary School Students on the Variable 'e-Learning'

The distribution of scores for total sample of senior secondary school students on the variable 'e-Learning' is given in Table 3.3.

Table 3.3: Distribution of Scores for Total Senior Secondary School Students on the Variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
300-319	3	0.75	100.00
280-299	10	2.50	99.25
260-279	29	7.25	96.75
240-259	88	22.00	89.50
220-239	137	34.25	67.50
200-219	92	23.00	33.25
180-199	39	9.75	10.25

160-179	1	0.25	0.50
140-159	0	0.00	0.00
120-139	0	0.00	0.00
100-119	1	0.25	0.25
Total	**400**	**100**	**100**

Highest Score = 313

Lowest Score = 117

Range = 196

Figure 3.1: Bar Diagrams Based upon Frequency Distributions for Male, Female and Total Sample of Senior Secondary School Students for the Scores on e-Learning

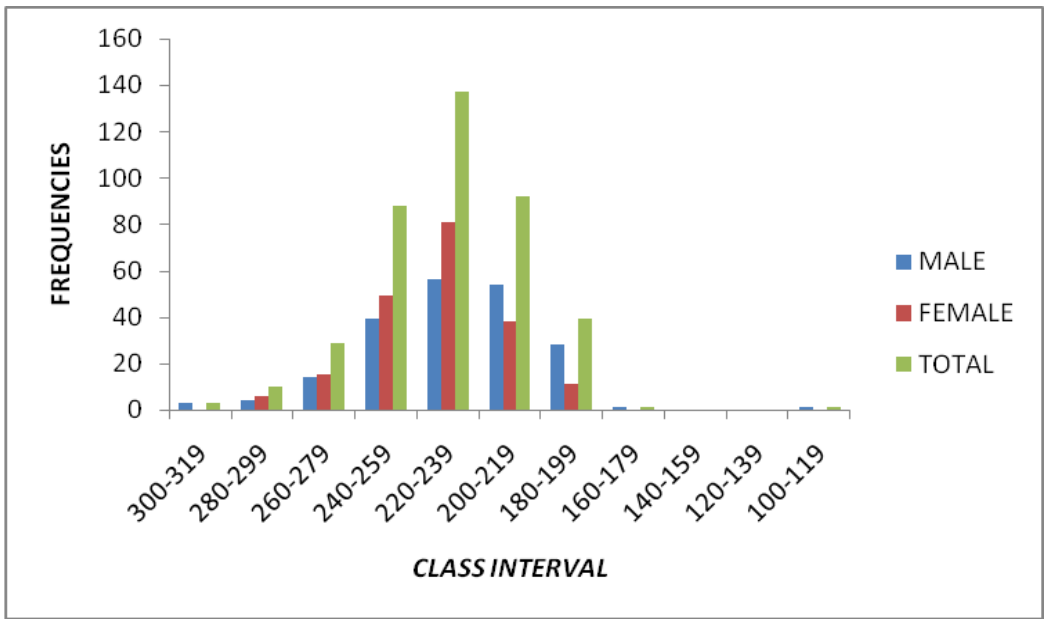
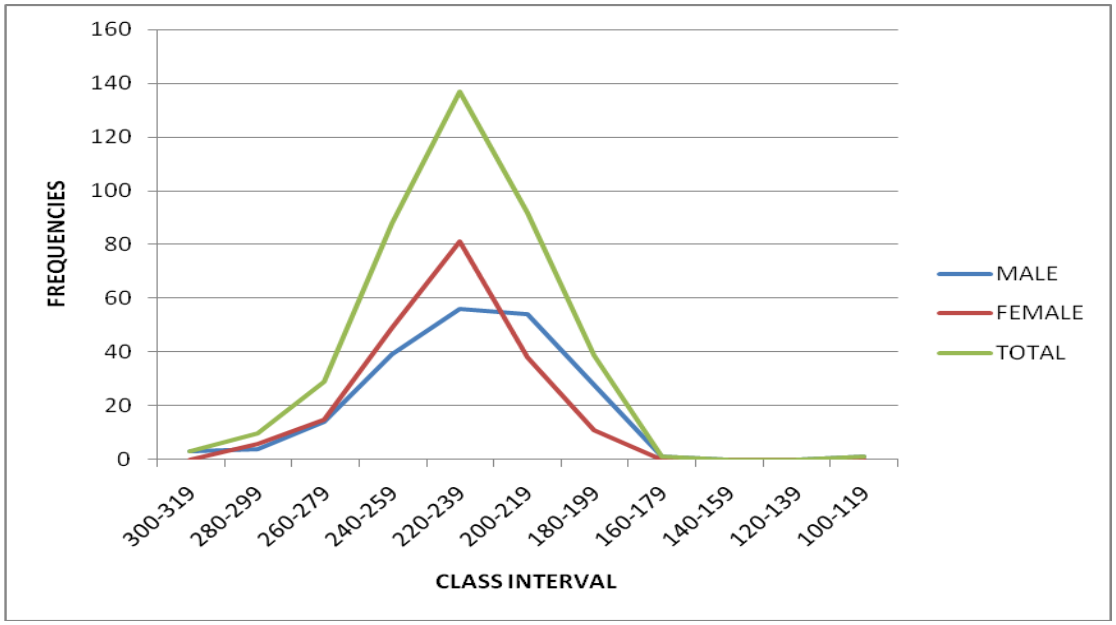


Figure 3.2: Line Diagrams Based upon Frequency Distributions for Male, Female and Total Sample of Senior Secondary School Students for the Scores on e-Learning



Interpretation

It is revealed from frequency distributions for male, female and total sample given in Table 3.1, 3.2 and 3.3 and corresponding bar and line diagrams given in Figures 3.1 and 3.2 that the scores on the variable of e-learning are distributed over a range of 196 for male, 115 for female and 196 for the total sample. Thus, it may be said that the senior secondary school students differ in their level of e-learning. Hence, the hypotheses that *" Male Senior Secondary school students do not differ in their level of attitude towards e-learning"; " Female Senior Secondary school students do not differ in their level of attitude towards e-learning" and "Total sample of senior secondary school students do not differ in their level of attitude towards e-learning"* are rejected.

It is further revealed from the Tables and Figures that the nature of distribution of scores on the variable of e-learning is more or less similar for senior secondary

school male, female and total sample. This is evident from the fact that 88.50, 89.50 and 89.00 per cent subjects fall between the scores 180 to 259 for the male, female and total sample respectively indicating almost similar concentration of scores in a limited range.

3-2.1.2 e-Learning among Senior Secondary School Students with respect to locality

A. Distribution of Scores on Locality for Senior Secondary School Students on the Variable 'e-Learning'

The distribution of scores for rural senior secondary schools on the variable 'e-Learning' is given in Table 3.4.

Table 3.4: Distribution of Scores for Rural Secondary School on the variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
300-319	3	1.50	100.00
280-299	8	4.00	98.50
260-279	17	8.50	94.50
240-259	47	23.50	86.00
220-239	67	35.50	62.50
200-219	38	19.00	29.00
180-199	20	10.00	10.00
Total	**200**	**100**	**100**

Highest Score = 313
Lowest Score = 182
Range = 131

B. Distribution of Scores for Urban Secondary School Students on Locality on the Variable 'e-Learning'

The distribution of scores for urban senior secondary school students on the variable 'e-Learning' is given in Table 3.5.

Table 3.5: Distribution of Scores for Urban Senior Secondary School Students on the Variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
280-299	2	1.00	100.00
260-279	12	6.00	99.00
240-259	41	20.50	93.00
220-239	70	35.00	72.50
200-219	54	27.00	37.50
180-199	19	9.50	10.50
160-179	1	0.50	1.00
140-159	0	0.00	0.00
120-139	0	0.00	0.00
100-119	1	0.50	0.50
Total	**200**	**100**	**100**

Highest Score = 295

Lowest Score = 117

Range = 178

Figure 3.3: Bar Diagrams Based upon Frequency Distributions for Rural and Urban Sample of Senior Secondary Schools for the Scores on e-Learning

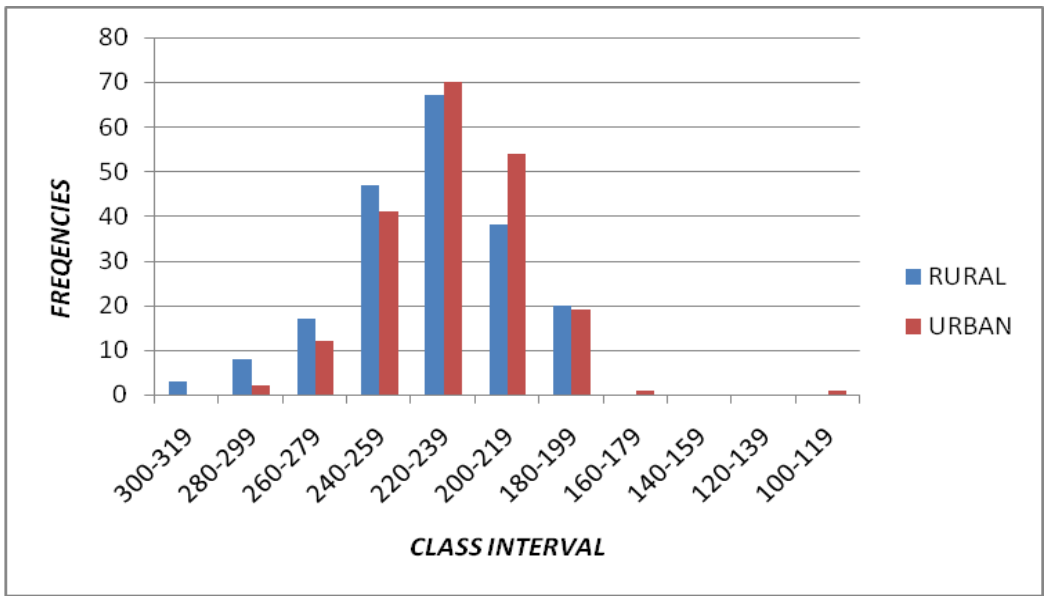
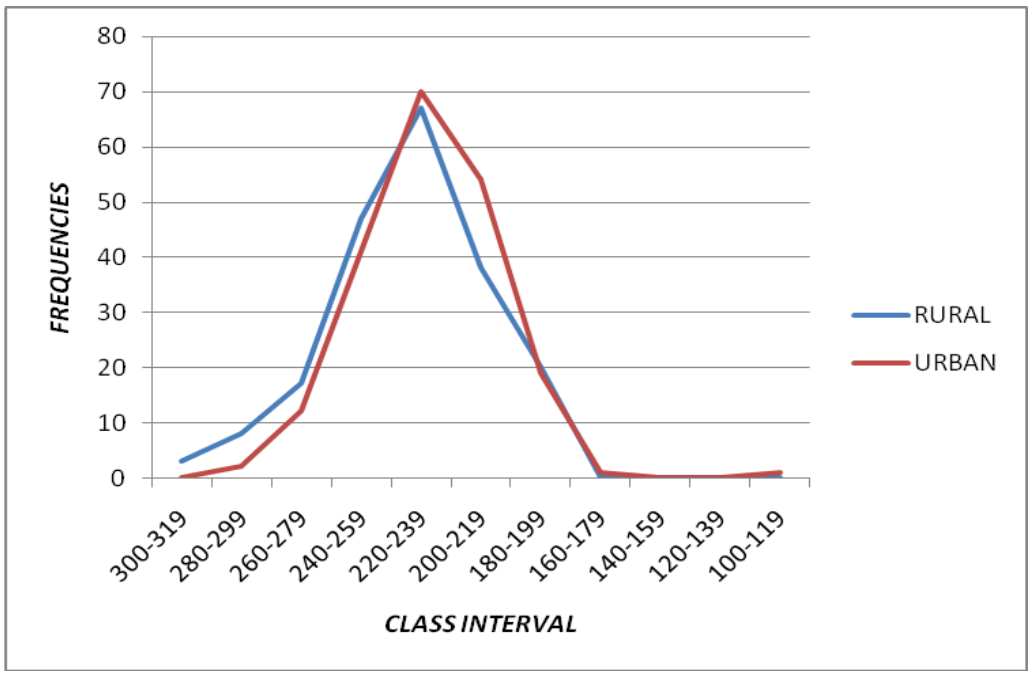


Figure 3.4: Line Diagrams Based upon Frequency Distributions for Rural and Urban Sample of Senior Secondary Schools for the Scores on e-Learning



Interpretation

It is revealed from frequency distributions for rural and urban sample given in Table 3.4 and 3.5 and corresponding bar and line diagrams given in Figures 3.3 and 3.4 that the scores on the variable of e-learning are distributed over a range of 131 for rural and 178 for urban sample. Thus, it may be said that the senior secondary school students differ in their level of e-learning. Hence, the hypotheses that *"Rural Senior Secondary school students do not differ in their level of e-learning"; "Urban Senior Secondary school students do not differ in their level of e-learning"* are rejected.

It is further revealed from the Tables and Figures that the nature of distribution of scores on the variable of e-learning is more or less similar for senior secondary school rural and urban sample. This is evident from the fact that 86.00 and 92.00 per cent subjects fall between the scores 180 to 259 for the rural and urban sample respectively indicating almost similar concentration of scores in a limited range.

3-2.1.3 e-Learning among Senior Secondary School Students with respect to stream

A. Distribution of Scores on Stream for Senior Secondary School Students on the Variable 'e-Learning'

The distribution of scores for arts senior secondary school students on the variable 'e-Learning' is given in Table 3.6.

Table 3.6: Distribution of Scores on Arts for Senior Secondary School Students on the variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
300-319	3	1.50	100.00

280-299	5	2.50	98.50
260-279	15	7.50	96.00
240-259	43	21.50	88.50
220-239	69	34.50	67.50
200-219	46	23.00	32.50
180-199	18	9.00	9.50
160-179	0	0	0
140-159	0	0	0
120-139	0	0	0
100-119	1	0.50	0.50
Total	**200**	**100**	**100**

Highest Score = 313

Lowest Score = 117

Range = 196

B. Distribution of Scores for Science Senior Secondary School Students on the Variable 'e-Learning'

The distribution of scores for science senior secondary school on the variable 'e-Learning' is given in Table 3.7.

Table 3.7: Distribution of Scores on Science for Senior Secondary School Students on the Variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
280-299	6	3.00	100.00
260-279	14	7.00	97.00
240-259	45	22.50	90.00
220-239	68	34.00	67.50
200-219	46	23.00	33.50
180-199	20	10.00	10.50
160-179	1	0.50	0.50
Total	**200**	**100**	**100**

Highest Score = 295

Lowest Score = 161

Range = 134

Figure 3.5: Bar Diagrams Based upon Frequency Distributions for Arts and Science Sample of Senior Secondary Schools for the Scores on e-Learning

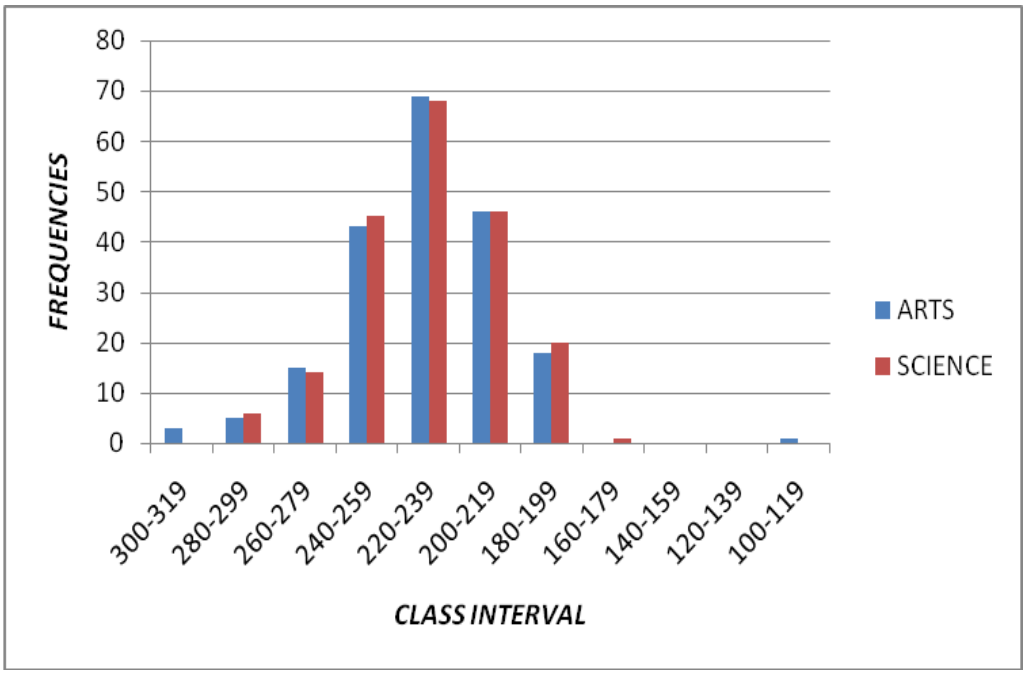
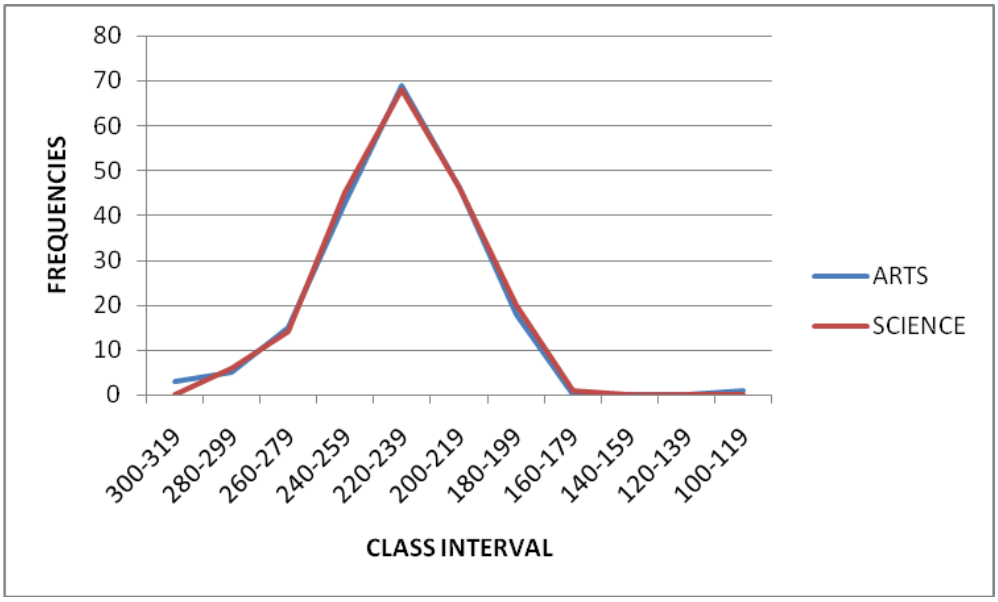


Figure 3.6: Line Diagrams Based upon Frequency Distributions for Arts and Science Sample of Senior Secondary Schools for the Scores on e-Learning



Interpretation

It is revealed from frequency distributions for arts and science sample given in Table 3.6 and 3.7 and corresponding bar and line diagrams given in Figures 3.5 and 3.6 that the scores on the variable of e-learning are distributed over a range of 196 for arts and 134 for science sample. Thus, it may be said that the senior secondary school students differ in their level of e-learning. Hence, the hypotheses that *"Arts Senior Secondary school students do not differ in their level of e-learning"; "Science Senior Secondary school students do not differ in their level of e-learning"* are rejected.

It is further revealed from the Tables and Figures that the nature of distribution of scores on the variable of e-learning is more or less similar for senior secondary school arts and science sample. This is evident from the fact that 88.00 and 89.50 per cent subjects fall between the scores 180 to 259 for the arts and science sample respectively indicating almost similar concentration of scores in a limited range.

3-2.1.4 e-Learning among Senior Secondary School Students with respect to type of school

A. Distribution of Scores on Types of Schools for Senior Secondary School Students on the Variable 'e-Learning'

The distribution of scores for government senior secondary school students on the variable 'e-Learning' is given in Table 3.8.

Table 3.8: Distribution of Scores for Government Senior Secondary School Students on the variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
300-319	1	0.50	100.00
280-299	3	1.50	99.50
260-279	15	7.50	98.00
240-259	43	21.50	90.50
220-239	69	34.50	69.00
200-219	47	23.50	34.50
180-199	22	11.00	11.00
Total	**200**	**100**	**100**

Highest Score = 313

Lowest Score = 180

Range = 133

B. Distribution of Scores for Private Senior Secondary School Students on the Variable 'e-Learning'

The distribution of scores for private senior secondary school on the variable 'e-Learning' is given in Table 3.9.

Table 3.9: Distribution of Scores for Private Senior Secondary School Students on the Variable 'e-Learning'

Class Interval	Frequency	Percent	Cumulative Frequency
300-319	2	1.00	100.00
280-299	7	3.50	99.00
260-279	14	7.00	95.50
240-259	45	22.50	88.50
220-239	68	34.00	66.00
200-219	45	22.50	32.00
180-199	17	8.50	9.50
160-179	1	0.50	1.00
140-159	0	0.00	0.00
120-139	0	0.00	0.00
100-119	1	0.50	0.50
Total	**200**	**100**	**100**

Highest Score = 305

Lowest Score = 117

Range = 188

Figure 3.7: Bar Diagrams Based upon Frequency Distributions for Government and Private Sample of Senior Secondary Schools for the Scores on e-Learning

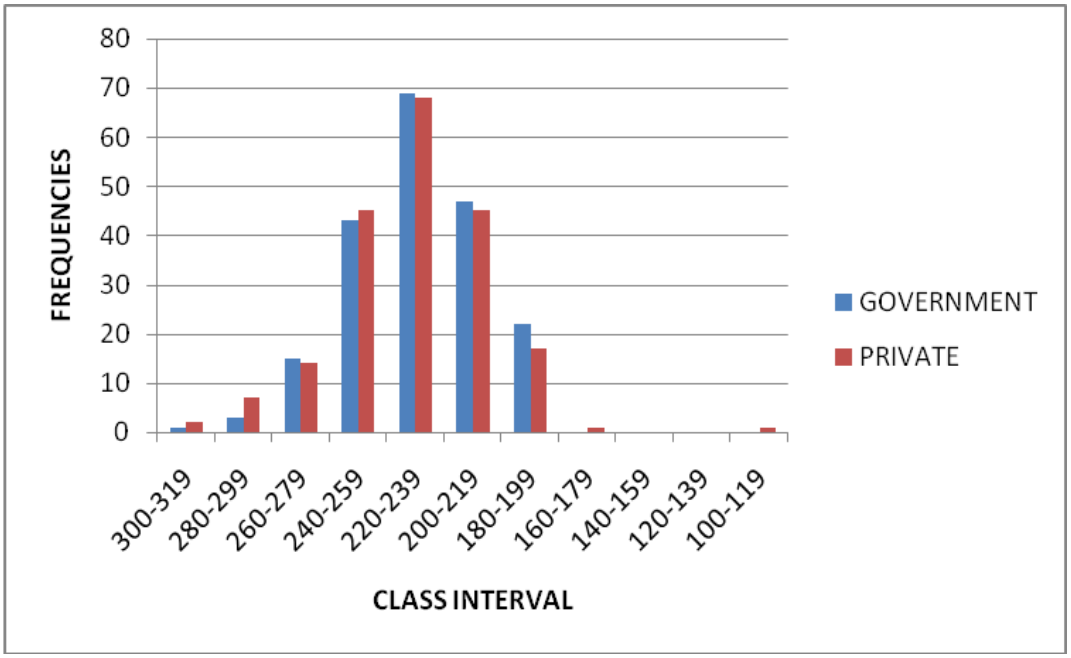
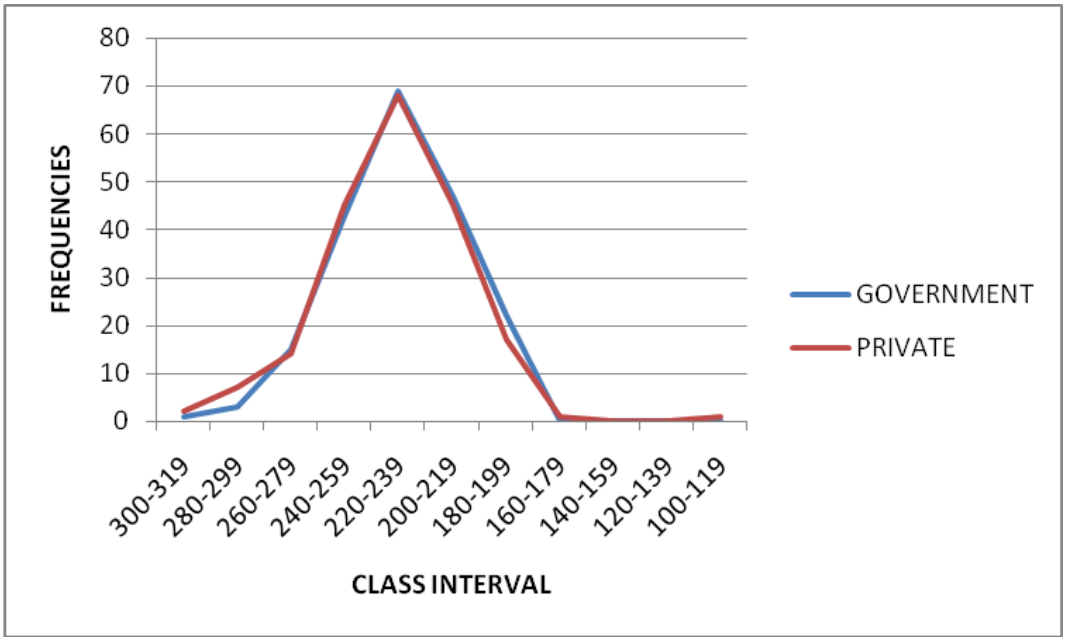


Figure 3.8: Line Diagrams Based upon Frequency Distributions for Government and Private Sample of Senior Secondary Schools for the Scores on e-Learning



Interpretation

It is revealed from frequency distributions for government and private sample given in Table 3.8 and 3.9 and corresponding bar and line diagrams given in Figures 3.7 and 3.8 that the scores on the variable of e-learning are distributed over a range of 133 for government and 188 for private sample. Thus, it may be said that the senior secondary school students differ in their level of e-learning. Hence, the hypotheses that *"Government Senior Secondary school students do not differ in their level of e-learning"; "Private Senior Secondary school students do not differ in their level of e-learning"* are rejected.

It is further revealed from the Tables and Figures that the nature of distribution of scores on the variable of e-learning is more or less similar for senior secondary school government and private sample. This is evident from the fact that 90.50 and 87.50 per cent subjects fall between the scores 180 to 259 for the government and private sample respectively indicating almost similar concentration of scores in a limited range.

3-3 Studying the Gender, Stream, Types of School and Locality Differences on the Variable of e-Learning

3-3.1 Male and Female Senior Secondary School Students

Table 3.10 presents the t-value for male and female Senior Secondary School students in respect of the variable of e-learning along with Ns, Means, SDs and Standard Error of Means for the two groups.

Table 3.10: t-value for male and female senior secondary school students in respect of the variable of e-Learning

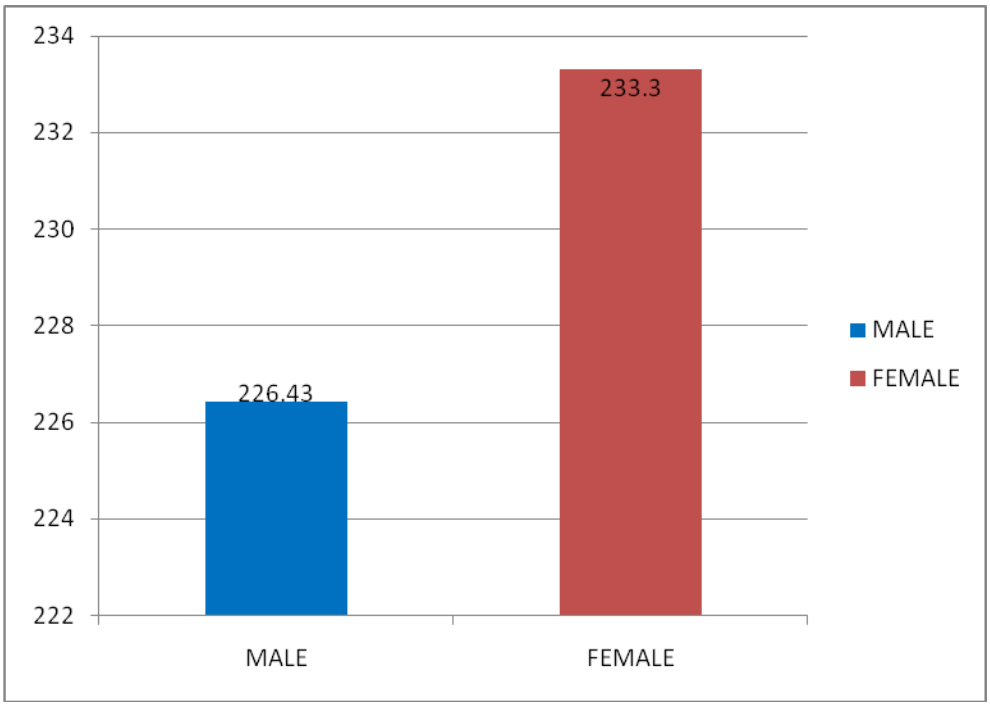
Group	N	Mean	SD	SE_M	df	t-value
MALE	200	226.43	27.50	1.92	398	2.81**
FEMALE	200	233.30	21.32	1.51		

**Significant at 0.01 level of confidence

It is revealed from Table 3.10 that t-value came out to be 2.81, which is significant at 0.01 level of confidence. This indicates that male and female senior secondary school students differ significantly with respect to their mean scores on e-learning. Hence, the hypothesis that *"Male and Female senior secondary school students do not differ significantly with respect to their attitude towards e-learning"* is rejected.

Since, the mean score on e-learning is higher for female (233.30) as compared to male (226.43), it may be inferred that female senior secondary school students exhibit significantly higher attitude towards e-learning in comparison to the male. Such data for its better understanding have been presented in figure 3.9 in the form of bar diagram.

Figure 3.9: Bar Diagram depicting mean scores on e-Learning among Male and Female senior secondary school students



3-3.2 Arts and Science Senior Secondary School Students

Table 3.11 presents the t-value for arts and science senior secondary school students in respect of the variable of e-learning along with Ns, Means, SDs and Standard Error of Means for the two groups.

Table 3.11: **t-value for arts and science senior secondary school students in respect of the variable of e-Learning**

Group	N	Mean	SD	SE_M	df	t-value
Arts	200	230.20	25.72	1.82	398	0.07 NS
Science	200	230.02	23.72	1.68		

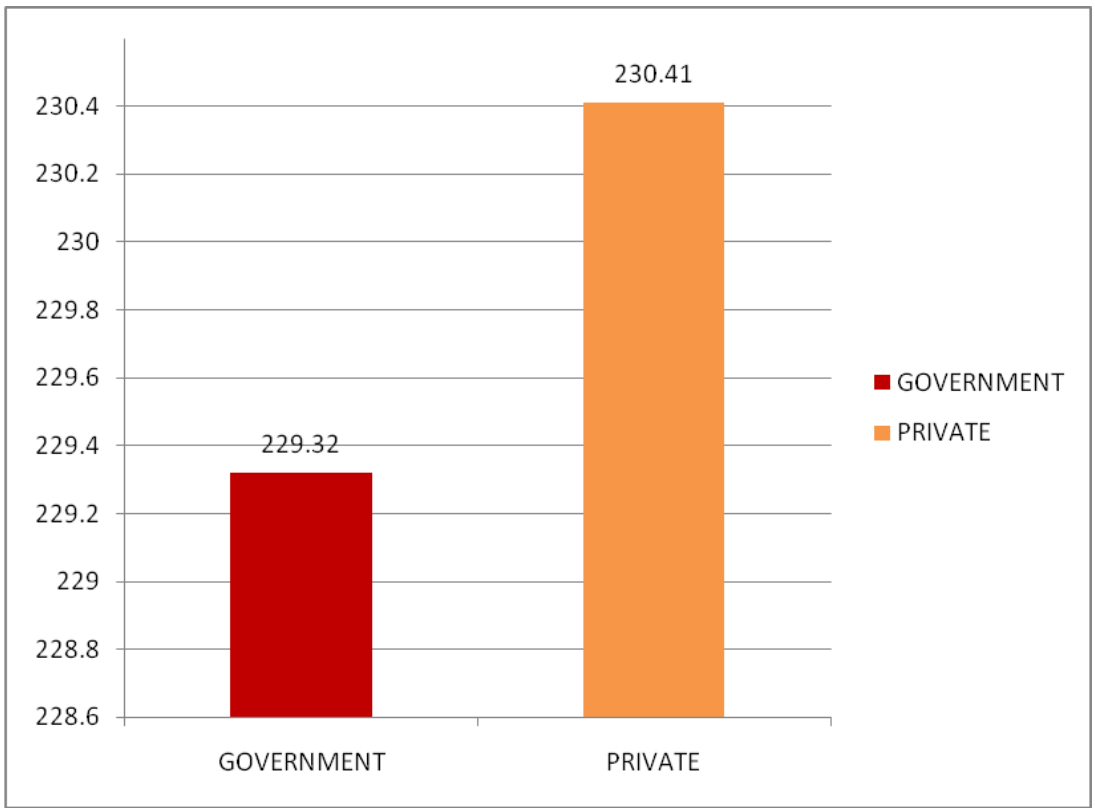
NS= Not Significant

It is revealed from Table 3.11 that t-value came out to be 0.07, which is not significant. This indicates that male and female senior secondary school students do not differ

significantly with respect to their mean scores on e-learning. Hence, the hypothesis that *"Arts and Science senior secondary school students do not differ significantly with respect to their attitude towards e-learning"* is accepted.

Hence, it may be inferred that Arts and Science senior secondary school students exhibit more or less similar attitude towards e-learning. Such data for its better understanding have been presented in figure 3.10 in the form of bar diagram.

Figure 3.10: Bar Diagram depicting mean scores on e-Learning among Arts and Science senior secondary school students



3-3.3 Government and Private Senior Secondary School Students

Table 3.12 presents the t-value for government and private Senior Secondary School students in respect of the variable of e-learning along with Ns, Means, SDs and Standard Error of Means for the two groups.

Table 3.12: t-value for government and private senior secondary school students in respect of the variable of e-Learning

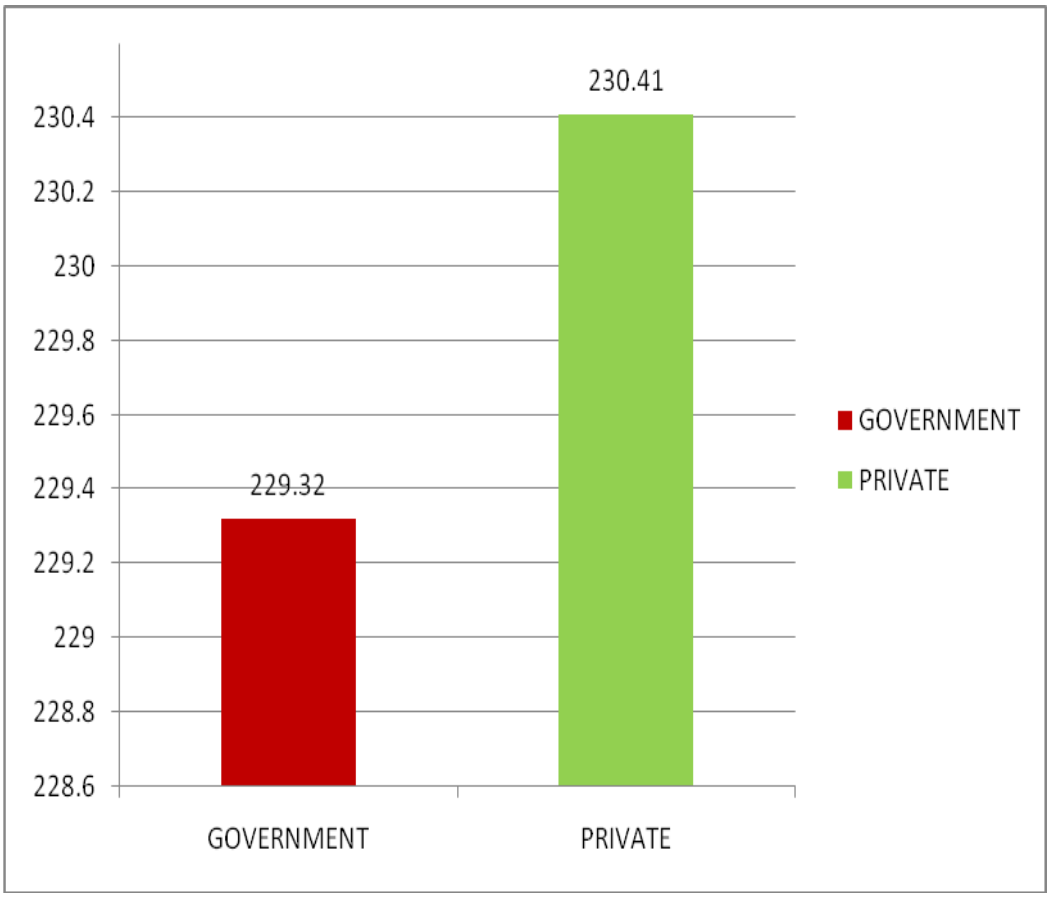
Group	N	Mean	SD	SE_M	df	t-value
Government	200	229.32	23.16	1.63	398	0.45 NS
Private	200	230.41	26.02	1.85		

NS= Not Significant

It is revealed from Table 3.12 that t-value came out to be 0.45, which is not significant. This indicates that Government and Private senior secondary school students do not differ significantly with respect to their mean scores on e-learning. Hence, the hypothesis that *"Government and Private senior secondary school students do not differ significantly with respect to their attitude towards e-learning"* is accepted.

Hence, it may be inferred that Government and Private senior secondary school students exhibit more or less similar attitude towards e-learning. Such data for its better understanding have been presented in figure 3.11 in the form of bar diagram.

Figure 3.11: Bar Diagram depicting mean scores on e-Learning among Government and Private senior secondary school students



3-3.4 Rural and Urban Senior Secondary School Students

Table 3.13 presents the t-value for Rural and Urban Senior Secondary School students in respect of the variable of e-learning along with Ns, Means, SDs and Standard Error of Means for the two groups.

Table 3.13: t-value for rural and urban senior secondary school students in respect of the variable of e-Learning

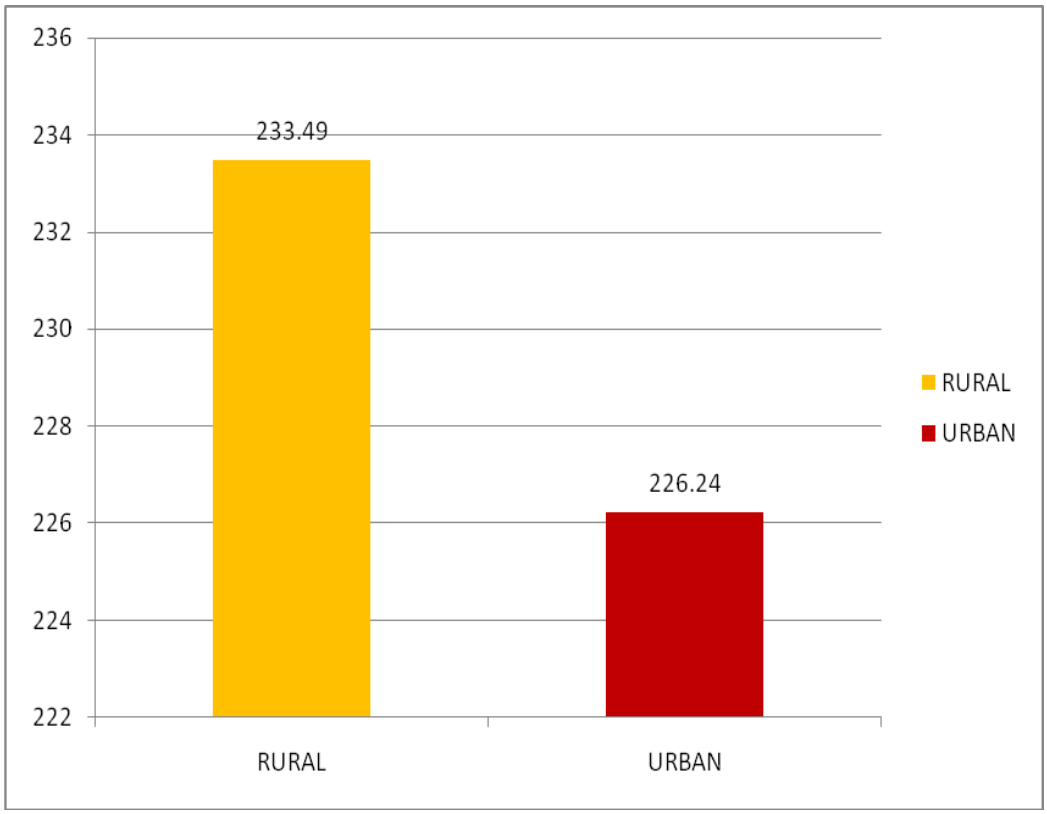
Group	N	Mean	SD	SE_M	df	t-value
Rural	200	233.49	25.59	1.63	398	2.98**
Urban	200	226.24	23.10	1.81		

**Significant at 0.01 level of confidence

It is revealed from Table 3.13 that t-value came out to be 2.98, which is significant at 0.01 level of confidence. This indicates that Rural and Urban senior secondary school students differ significantly with respect to their mean scores on e-learning. Hence, the hypothesis that *"Rural and Urban senior secondary school students do not differ significantly with respect to their attitude towards e-learning"* is rejected.

Since, the mean score on e-learning is higher for Rural (233.49) as compared to Urban (226.24), it may be inferred that rural senior secondary school students exhibit significantly higher attitude on e-learning in comparison to the urban. Such data for its better understanding have been presented in figure 3.12 in the form of bar diagram.

Figure 3.12: Bar Diagram depicting mean scores on e-Learning among Rural and Urban senior secondary school students



CHAPTER 1
INTRODUCTION

The ongoing technological changes have made the education to pass through lot of changes from traditional Gurukal system to modern school. When the education system undergoes major reform, the educational processes will surely pass through the same. It is need of the hour for the educationist to introduce some innovation in the education system (Rizwana and Singh, 2016).

The advancement of Information Technology (IT) has impacted on how things are done, its influence on teaching and learning, thus becomes increasingly complex and widespread. The use of latest technology means that one no longer needs to be located in a conventional classroom in order to be educated. Teaching and learning can be done with the help of technology – e-Learning (Mamattah, 2016).

The use of technology in learning can be referred to as electronic learning (e-Learning) which comprises a wide range of applications and processes designed to deliver instruction through electronic means. e-Learning signals a paradigm shift in education and its profound effect on education cannot be underestimated (Ouma, Awour and Kyambo, 2013)

The computer age has changed the entire world, especially incorporate in the areas of self motivation, communication, efficiency and technology. e-Learning helps learners to overcome the limited social interactions and facilitates for self-motivation. e-Learning is efficient as it eliminates distance and subsequent commutes (Bhuvaneswari and Padmanabam, 2012).

1-1 e-Learning

e-Learning is a relatively new phenomenon that is growing in a significant number of universities around the world, enhancing the teaching and learning processes. Enhancements include incorporating text, audio, video and animation into course lectures, retrieving information from online journals, periodicals and newspapers including simulations and multi-media presentations in the classroom; enhancing communication and collaboration between professors and students and uploading course content and tests to university websites **(**Akimanimpaye, 2012).

e-Learning is a learner-centered instructional strategy which provides students with the opportunity for an in-depth investigation of a given topic. With the advent of information technology and its growing use in education sector, a transformation is seen in traditional and conventional teaching methods that are used in schools (Ashraf, Khan and Rehman, 2016).

e-Learning platform based on network promote personal knowledge accumulation and group knowledge sharing, which can improve learning efficiency, facilitate the innovation of knowledge, and then enhance the core competitiveness of individual and group **(**Kar, Saha and Mondal, 2011).

It is interactive learning in which learner can also communicate with teachers, professors or other students in the class. Sometimes it is delivered live; where one can "electronically" raise hand and interact in real time and sometimes it is a lecture that has been pre-recorded (Gaikwad and Randhir, 2015).

With global communication and internet connection speed, web content has grown richer and more interactive for users. It has certainly changed the way we acquire knowledge learning is no longer the same as before that limited to classroom. e-

Learning is seen as a future application world wide as it promotes lifelong learning by enabling learners to learn anytime and anywhere (Aixia and Wang, 2011).

e-Learning can be described as using all electronic media and technologies, including the internet, intranet, extranet, satellite broadcasts, audio/video tape, interactive television, CD-Rom and video-conferencing, to delivery instructional content and to create, foster and facilitate learning experiences. e-Learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning (Gambhir, 2008).

It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio. Abbreviations like CBT (Computer-Based Training), IBT (Internet-Based Training) or WBT (Web-Based Training) have been used as synonyms to e-learning (Yacob, Kadir, Zainudin and Zurairah, 2011).

e-Learning has become extremely popular. The rise in Internet users and the revolutionary changes that have happened in education have created a fertile environment for e-Learning to grow. The face of higher education has experienced a sea change over the decades. Once characterized by the traditional classroom model, higher education today has changed into learning that is instant, online, self-driven and on the go. The journey of higher education in India has been marked with innumerable milestones – most recently, e-Learning (Bhadauria, 2016).

The uniqueness of e-Learning is that it provides the learner the opportunity to learn anytime, anywhere. e-Learning is the only method of learning, where three distinct learning styles of auditory learners, visual learners, and kinaesthetic learners are incorporated. And by using learning style tests, e-Learning can locate and target individual learning preferences. e-Learning is inclusive of a maximum range of learning styles, preferences, and needs. Advanced learners are allowed to speed through or

bypass instruction that is redundant while novices slow their own progress through content, eliminating their own frustrations (Nelasco et al. 2007).

e-Learning strategy of presentation has the use of LCD projector, use of power point slides and animation which are necessary for classroom learning. The e-Learning strategy of Effectiveness has the You-tube classroom learning, the on-line tutorial learning and e-learning that helps to get more marks. e-Learning strategy of Types consists of Synchronous learning (video conferencing, web conferencing, chatting and telephone and Asynchronous learning (CD-ROMs, cassettes, e-mail) which give more effective teaching (Eugene and Panchanatham, 2016).

Online education or e-Learning is uniquely suited to adult education as participants can access their lessons, communicate with the class or teacher, and collaborate with others wholly online (Ngampomchai and Adams, 2016).

The ability to continuously learn the altitudes of students in e-Learning, coupled with competence in aligning e-learning to changing the way of transferring knowledge to remote students is one of the key sources of competitive advantage in present context (Kisanjara, 2014).

There are some important factors for the success of e-learning during implementation in Higher Education institutions. Poor preparation can affect the use of e-learning facilities. Poor instructor awareness and training in using e-learning facilities will lead to poor outcomes. The availability of connections toe-learning websites combined with slow downloads discourages students from using e-learning (Al-Doub, Goodwin and Al-Hunaiyyan, 2009).

1-2 e-Learning Application Systems

Aixia and Wang (2011) reported the following:

1. *Portal System*: The e-Learning Portal, sits on top of a variety of application system, is not only the unified access point for all application systems, but also the information platform where and all kinds of information from the e-learning platform can be released and collected.
2. *Virtual Classroom System:* It has the function of simultaneously recording class content that can be automatically changed into courseware for students to download.
3. *Learning Management System:* Generally, learning management system includes curriculum resources management, curriculum training, curriculum collaboration, a variety of academic information and student data management.
4. *Resource Management System:* Resource management system allows teachers to achieve issuing and collating of teaching resources. In this way, accumulating, sorting and sharing of curriculum resources will become easier. Resource management system is connected with the digital library of Ningbo University so that students can retrieve and use digital resources more easily.
5. *Multi-Media Recording System:* In order to construct the Multimedia recording system, many recorded components have been added to the original equipment in the school multi-media classrooms, conference rooms and lecture halls. Without teacher intervention, teaching process, including teachers, audio, video, and screen and writing on the blackboard, has been recording into courseware directly. Recorded Multimedia files can be easily embedded in the Web pages and courseware.

6. *Bulletin Board System:* BBS in this platform has a "campus community" feature. Using this system, faculty or department managers can not only issue notices and manage information resources, but also design a home page with faculty / department's features. In addition, BBS can also be used for a certain unit or groups of students to improve the efficiency of the daily work.
7. *Teaching Evaluation System:* The teaching evaluation system includes teaching assessment subsystem, student learning assessment subsystem and teaching management evaluation subsystem. The purpose is to evaluate the performance of teachers, students and administrators in the integrated digital learning platform.

1-3 e-Learning Strategies

e-Learning Strategies can be classified into six different uses;

i) *Computers in Classrooms:* Students can access the internet in the classrooms simultaneously along with the teacher while explaining the subject matter or the content through the visual media and have a better understanding and also makes the learning interesting.

ii) *Computer as Study Tools:* Computer is an important tool in e-Learning Platform without which the e-Learning process cannot exist.

iii) *Computer as Simple Learning Resources:* On the internet we can access every simple detail on the internet. It provides information of every subject matter or content.

iv) *Computer as Complex Learning Resources:* It provides information to the simple learning as well as it also provides information to the complex learning which makes the learning easy and interesting to the students.

v) *Computer for Teacher-Student Communication:* Through the internet teacher and students can communicate despite of distance without any hurdle. Even if the teacher is out of the institution or abroad teacher can communicate to his students through video calls, online conference.

vi) *Computer for Student-Student Communication:* It helps the students to communicate with each other and share their ideas, views and understanding of their subject content on social networking sites and through emails, video calls etc.

1-4 Benefits of e-Learning

- e-Learning benefits the students because it can be accessed 24hours at anytime from anywhere around the world.
- e-Learning provides knowledge and information about the subject content and helps the students to complete their projects, assignments at any hour from any place by assessing the website such as Wikipedia.
- e-Learning provides faster information within the short span of time to the students which keeps them updated with the new information and makes the consistent life-long learning.
- e-Learning is cost effective in time and location flexibility. Nowadays each and every individual access internet in their mobiles, iphone, ipad, laptops at their own home.
- e-Learning helps the students to be active and promotes creative learning amongst the students.
- e-Learning also promotes the phases of self-study amongst the students at their own pace.

- e-Learning males the learning interactive and increase involvement of the students in their educational activities and also helps them to interact with their friends and teacher through online.
- As e-Learning promotes consisted learning it enables the students to access the online library and get the knowledge and information at anytime from anywhere.
- Through e-Learning, the students gather knowledge and information of their interest of subject content on the online journal.
- The virtual classroom system, which enables inter-school academic lectures and video conferencing, has the function of interactive video teaching. When teachers go abroad on a business or a meeting, remote instruction between teachers and students, for example, video exchange, text dialogue, voice answering, PPT presentations, desktop sharing, document and file transfer, etc., will be achieved through the Internet-based "video class" (Aixia and Wang, 2011).

In addition, e-learning makes the process of learning interactive and collaborative by linking each learner with physically apart experts, time and location flexibility, time and cost effective for students. E-learning develops new educational methods that increase the educational effectiveness and learning opportunities, where knowledge are stored at a Web page and can be updated and maintained regularly. From the student point of view, e-learning is a form of education that implies involvement, motivation and communication efficient (Sabah, 2013). Students' attitude towards e-Learning is influenced by its perceived advantages and disadvantages. The schedule flexibility is, without no doubt, an important advantage, the student having the opportunity to learn no matter his location, no matter the time as long as he has an Internet connection. Reducing costs is another benefit together with time saving, in case of students who are

commuting. e-Learning is a solution for students hired during their studies, allowing them to adapt their learning schedule to their job program. So, the student has the possibility to choose how he organizes his activities (Bertea, 2009).

1-5 Disadvantages of e-Learning

Nowadays e-Learning is an incredibly powerful tool for learning but depending solely on an e-Learning platform can make learning less personal, less engaging and, in the process less effective. Some of the disadvantages of e-Learning are;

i) *Lack of Self Discipline*: Due to inherent freedom it lacks self discipline as the students access the internet for their subject content but mostly ends up in surfing internet on Social Networking Sites.

ii) *Lack of face to face interaction***:** e-Learning lacks face to face interaction between the teacher and the students in person and it lacks intimate rapport between them which makes the learning less productive.

iii) Sometimes on e-Learning it might seems that learning material is available but it's not and also many people struggles to access the internet.

Change in interpersonal abilities of scholars; electronic training as a strategy may have a discouraging impact. Scholars however may possess great information in scholastics; they may not have the required abilities to convey their obtained knowledge to others (Ogunnowo, 2016).

1-6 Reviews of Related Literature

Every researcher has to go through and present a review of the literature related with his research problem. This literature includes a vast array of things – theses and dissertations, journals and magazines, reviews and abstracts, books and newspapers, reports and original documents – in print or in some other media like video cassettes,

computer discs and floppies, movies and filmstrips. A review of related research serves several important purposes and helps the researcher at every step of his venture.

1-6.1 Reviews of Related Literature on Attitude towards e-Learning

Paris (2004) conducted a research study and found that some students engage in and accept the use of OWAL to supplement their learning, if not school, then at home. The data indicates that OWAL activities would aid in the learning process of students because students have a positive attitude towards the use OWAL.

Vrana, Zafiropoulos and Drogalas (2005) in their study found that students in small rural high schools, isolated small islands can complete their courses online and gain academic credit at quality institutions of education. Availability of online course-equivalent learning environments may mean that an injured and homebound high school senior, unable to attend the one available section of a required class, can fulfil the requirement and graduate with the rest of his or her class. The findings argue that students of secondary vocational schools regard e-learning as an option but yet they are not ready to assimilate it in their classrooms as they keep some second thoughts about its implementation.

Link and Marz (2006) found that the great majority of students possess sufficient computer skills and acknowledge the advantages of interactive and multimedia-enhanced learning material, a small percentage lacks basic computer skills and/or is very sceptical about e-learning. There is also a consistently significant albeit weak gender difference in available computer infrastructure and Internet access. As for student attitudes toward e-learning, we found that age, computer use, and previous exposure to computers are more important than gender. A sizable number of students, 12% of the total, make little or no use of existing e-learning offerings.

Smart and Cappel (2006) conducted a research and found that participants in an elective course rated the online modules significantly better than those in a required course. Overall, participants in the elective course rated the online modules marginally positive while those in the required course rated them marginally negative.

Al-Doub, Goodwin and Al-Hunaiyyam (2008) they conducted a research and found that the students in both government and private sectors were keen to use e-learning and there was some significant differences between male and female students in their attitudes and use of e-learning materials.

Jafar, Mohammadi, Iravani, Attaran and Gheidi (2008) in their study found that students have positive perception towards e-learning. Liner regression analysis indicated that 68% of variation in virtual students' perceptions of e-learning was determined by the four variables of: Students' assessment about competency of e-learning, access to internet, computer and internet usage and assessment of current higher education system's shortcomings.

Aixia and Wang (2011) conducted a research and found that the perception of e-learning is positively influenced by its flexibility in knowledge management, time management and widening access to information. Moreover, an integrated E-learning platform, providing many web-based, multi-platform tools, is introduced based on knowledge management.

Alabdullaziz, Alanazy and Alyahya (2011) conducted a research they found that there was a positive relationship between the instructors' experience with technology and their attitudes toward e-learning and the learners in the study also had a positive attitude toward e-learning. They reported the highest attitudes towards e-learning as a multimedia instructional environment. The learners rated pictures, videos, and

animations nearly the same. Learners also rated e-learning as an instructor-led learning environment rather highly.

Liaw and Huang (2011) found that male student have more positive e-learning attitudes than female students do; computer related experience is a significant predictor on learners' self-efficacy and motivation toward e-learning. Furthermore, self-efficacy and motivation, including intrinsic and extrinsic motivation, are significantly predictors on behavioural intention of using e-learning.

Mehra and Omidian (2011) conducted a research and they found that 76.0% students were significantly positive towards e-learning. However 24% of students had negative attitude towards e-learning. It was about 82% of students perceived e-learning usefulness. About 57% of students intended to adopt e-learning. Further, regression analysis revealed a statistically significant model for perceived usefulness of e-learning and intention to adopt e-learning as the best predictors of student's attitude towards e-learning.

Williams et. al. (2011) conducted a research and their finding reveals that paramedic student attitudes towards computers in general and computers in education found participants to have moderate attitudes, but a degree of ambivalence was evident. Consequently these participants did not indicate an interest in computers for computers' sake. With such attitudes, students are unlikely to utilise e-learning initiatives to their maximum unless they meet their needs.

Bhuvaneswari and Padmanaban (2012) found that Students' personal variables such as, gender, subject specialization, parents' education, parents' monthly income and school management are differed significantly among themselves.

Jasper et al. (2012) conducted a research and found that there were 90% female and 10% male students. The percentage of students according to races was 74% Malay,

21% Chinese and 5% Indian. The total mean score of perception toward e-learning was moderate which is 36.83 and there was no significant association between e-learning score and CGPA level ($p > 0.05$) and also there was no association between times spent on e-leaning towards CGPA level ($p > 0.05$). This study concluded that the duration of time spent for e-learning are not associated with students' academic achievements and e-learning did not affect students' academic achievements (CGPA).

Jawaid, Hafeez, Khan and Khalique (2013) found that most of the first-year medical students of Dow University of Health Sciences owned a personal computer or have access to family-owned computer with good internet connection. Students were familiar with the use of internet and browsed it regularly. Most of them used social media, especially Facebook. The respondents mostly expressed positive attitudes about the use of e-learning in their education but their experience of Learning Management Systems (LMS) was very limited.

Ouma, Awour, Fredrick and Kyambo (2013) found that students are not threatened by technology and they neither feel that computers are difficult to neither use nor result into their frustration. With students' perceived usefulness of technology in class of average mean score of 4.568 it confirms that students are ready to go on with e-learning. Students believe that computer will improve their learning and make learning interesting hence most of the students would like to use computers in the classroom. It can be summarized that the level of ICT infrastructure is still very inadequate for e-learning implementation. The Internet connectivity is very slow and unstable to support e-learning. The budget currently required to implement e-learning is unsustainable. The number of available computers is too limited compared to the enrolled students. The study found that lack of digital content is significant barrier to the implementing e-learning in the school.

Othman, Pislaru, Kenan and Impes (2013) in their study they found that Libyan students had positive attitudes towards e-learning and findings showed that e-learning supports traditional learning methods and the results based on the respondents' gender, educational level and age, also the findings showed that E-learning is also an effective teaching method to motivate students to learn and encourage them to continue in further education. Thus, technology plays an important role in improving and developing teaching methods as well as giving students wider opportunities to learn.

Sabah (2013) conducted a research and found that student have a positive opinion about learning teaching efficiency of about 82.2% and 83% to face-to-face and blending learning, respectively. Also, the results reveal a good correlation between attitude towards e-learning and technical abilities. However, students who use more often their computer (54% of the population) are more likely to accept e-learning with a positive attitude of about 82.4%. Information technology, English and Accounting students have a positive opinion about the internet's impact on their educational experience of about 79%, 74.3% and 68.2%, respectively.

Aldeeb (2014) found that students were enthusiastic to participate in the study and to use the e-learning and learning management system (LMS) (response rate 93%) and 98% of the participant believe in LMS and e-learning as a teaching/learning method and 94% had an earlier experience with e-learning in the form of attending online lectures, conferences, workshops and taking online tests which reflect good starting point of the new trend in DMC and DPC with a promising assurance of students‟ acceptance to the new trend. The study's findings spotted the lights on e- learning and LMS‟s availability, flexibility, self–control and convenience and identified them as areas of strength of the e-learning and LMS perceived by the students. Students believed that it was easy to use, eased their access to the course material and made it

available 24/7 as well as off campus which enhanced their time management and learning experience and outcomes. Also LMS and e-learning kept them on the track and updated about the modifications, assignments, and quizzes occurring throughout the course as they had an instant alert from the system even on their mobiles; this feature of the e-learning and LMS was appreciated by both the students and the researcher faculty.

Kar, Saha and Mondal (2014) conducted a research and found that students' have high attitude towards e-learning and their attitude scores did not differ significantly with their personal variables such as, gender, stream of study and residence.

Kisanjara (2014) conducted a research and found that students have positive readiness to use an e-learning revealed from aspects of application skills and technological skills as tools for assessment. On the other hand from the results, it was found that students have positive attitudes towards e-learning by considering habits and study ability used in the assessment and to students attitudes towards e-learning, it was found that students' is more favourable positively towards e-learning in higher learning institutions in respect to habits and study abilities tools used in the assessments.

Odeshi (2014) conducted a research and found that students have a positive attitude towards e-learning because they find the system easy to use and useful for their course work. Also, attitude influences the intention to use an e-learning system.

Pilli, Fanaeian and Al-Momani (2014) conducted a study and found that the students are satisfied to use the E-learning system, and this leads to increase the awareness of faculty members about the necessity of integrating E-learning in the educational process which in turn may lead to enhance students' academic achievements, especially those who wish to enjoy using modern technology in their educational life in order to get knowledge anytime and anywhere.

Rahim, Yusoff and Latif (2014) conducted a research and found that respondents did have access to technology that is required for e-Learning environment, and respondents were knowledgeable regarding the basic Internet skills. The finding also showed that respondents' attitude did meet all characteristics of successful e-Learning student. Further analysis showed that there is no significant relationship either among gender, level of study or faculty with those characteristics. As a conclusion, the study shows that current Unisel's students are ready to participate in e-Learning environment if the institution decided to embark on e-Learning methodology.

Rhema and Miliszewska (2014) in their study they found that there was a statistically significant correlation between student attitudes toward technology and their levels of access to various technologies; unsurprisingly, students who had better access to technology and the Internet generated stronger positive attitudes.

Ingec (2015) conducted a research and found that there was no significant differences between the attitudes of students of technical and vocational high school students towards e-learning with respect to their gender, experience in the use of computers, frequency of using internet and motivation style. One way ANOVA Analysis indicated that way of learning, way of the studying and learning methods had significant impacts on the students' attitude towards e-learning.

Mahmoud, Magarbi, Neama and Mohamed (2015) conducted a research and found that more than two-thirds of teaching staff members have positive attitude towards e-learning and the students also had positive attitude towards e- learning. All of the e-learning domains among the studied nursing students had statistically significant differences at P=0.001.

Okhovati, Sharifpoor, Islami, Hamzezadeh and Motamed (2015) in their study they found that the level of knowledge and skill of the students toward e-learning was

"moderate" and their attitude was "high". There were significant relationships between knowledge and skill (p=0.001; r=0.82) and also knowledge and attitude (p=0.001; r=0.37) but there were no significant relationship between skill and attitude (p=0.35; r=0.82). The scores of knowledge and skill were significantly different according to sex, but attitude had no significant difference with sex.

Visalam, Archana, Abirami and Padmavathi (2015) in their study they found that out of total students 71 % were confident in online searching and downloading along with using Microsoft word processor. 61% still prefer studying with text books as it is always available and it is widely in use. 76 % strongly agree that E- learning is method of learning and teaching method using electronic media and 71 % think that it should be used as a supplementary tool in teaching curriculum. Internet in the form of e-learning should be more used for academic purposes. 77% and 68% prefer E – learning for interactive sessions and scope for self assessment respectively. 78% feels that inclusion of animations, images and videos will make E – learning more beneficial and understandable and can retain better.

Asharf, Khan and Rehaman (2016) in their study they found that use of various e-learning tools and methodologies plays a significant role to make the learning process more effective.

Mamattah (2016) conducted a research and found that majority of the students think e-learning is an innovative idea and must be encouraged; however, few concerns such as the fear of employers' discrimination against those who study through e-learning were discovered. It was also realised that hybrid learning, which is a combination of online learning and face-to-face learning, is the preferred mode of learning for the respondents.

Ngamporncha and Adams (2016) found that the participants seemed to indicate that their acceptance of e-learning is slightly more than neutral, which implies that Thai students tend to accept e-learning prudently and the study reveals that the Thai students shows a positive relationship between acceptance of e-learning and self-regulation. Specifically, students who are more self-regulated also believe that online learning is useful and easy to use.

Rizwana and Singh (2016) in their research they found that there was a huge interest among students and students were interested in acquiring education through traditional as well as with e-learning type of system. It was clear from the responses that majority of students had preference towards e-learning form of education but as a supplement to traditional form of education. That means e-learning used as a substitute to traditional form of learning system would not be very effective among students.

Zabadi and Al-Alawi (2016) conducted a study and found that UBT participants' owns a high standard on attitude towards e-learning and their attitude results are significantly vary with their gender, technology usage and skills.

Edumadze and Barfi (2017) in their study they found that majority of the students have heard of e-learning platform. Challenges in the use of e-learning platform include irregular internet access, lack of technical know-how and lack of feedback from peers and teachers. However, there were significant relationship between students' perceived ease of use and perception towards e-learning platform and a significant relationship between technology accessibility and computer ownership.

Summary of the Reviews

Kar, Saha and Mondal (2014), Paris (2014), Kisanjara (2014), Alabdullaziz, Alanazy and Alyahya (2011), Jafar et al. (2008), Mahmoud et al. (2015), Mehra and Omidian (2011), Zabadi and Al-Alawi (2016) found students have a positive attitude towards e-

Learning. Bhuvaneswari and Padmanaban (2012) found students' personal variables such as gender, subject specialization, parents' education, parents' monthly income and school management are differed significantly among themselves. Ingec (2015), Rahim, Yusoff and Latiff (2014), found there was no significance difference between the attitudes of students towards e-Learning with respect to their gender. Whereas Zabadi and Al-Alwai (2016), Al-Doub, Goodwin and Al-Hunaiyyam (2008) found their attitudes towards e-Learning significantly vary with respect to gender.

Link and Marz (2006) found there is significance albeit weak gender difference in available computer infrastructure and internet access. Jasper et al. (2012), Okhovati (2015), and Williams et al (2011) found students have moderate attitudes computer in education. Visalam, Arcahan, Abirami and Padmavathi (2015) found 76% out of all the students that e-Learning is a method of learning. Vrana, Zafiropoulos and Drogalas (2005) found students of secondary school regard e-Learning as an option but yet they are not ready to assimilate it in their classrooms. Aldeeb (2014) found students were enthusiastic to participate in the study and to use the e-Learning.

1-7 Need and Significance of the Study

In today's era of information and communication technology we are totally depending on new technology, and even our educational firms are benefiting highly on e-Learning to give information about their institutions. e-Learning is a relatively new concept implying learning by means of digital media such as computers, web pages, video conferences systems and D-ROMS. e-Learning covers a wide set of ICT technology based applications and processes, including computer-based learning, web- based learning, virtual classrooms and digital collaboration and networking. In recent years computers programs for e-Learning consisting of tools such as text, graphics, video, three dimensional object and animations have been developed. Though it is common

insight that traditional learning is more efficient than e-Learning, the relevance of technology in Education has gained momentum and e-Learning has become a part of traditional teaching in majority of the universities and educational institutions. It foster great interaction and collaboration in the students and it accommodates multiple learning activities. In the rapid moving world, we can sustain only by making ourselves capable of racing with the pace of the time and technological progress. e-Learning is the demand of the time and we have to prepare our young students to tackle all the challenges they face in the modern technological life. Several studies have been conducted to examine attitude towards e-Learning all over the world. However, essentially it would seem that little research is done in this area at senior secondary school students' level in Sikkim state. Hence, this study sought to determine senior secondary school students' attitude towards e-Learning.

1-8 Research Question

The present study was attempted to answer the following research question:

1. Do the senior secondary school students differ in their attitude towards e-Learning?

1-9 Operational Definition of Key Terms

The different key terms used in the title of the study and to be used in the body of study are operationally defined as follows;

1. Senior Secondary School Students- It connotes the students studying in class XI in East District of Sikkim.

2. Attitude towards e-Learning – In the present study attitude towards e-Learning refers to the individual's positive or negative feelings of participation in e-learning activities through computer use.

3. **Gender**- It connotes the students male and female.

4. Stream- It refers the students belongs to arts and science stream.

5. **Type of School**- It connotes the private and government senior secondary schools.

6. Locality: It refers the student belongs to rural and urban area.

1-10 Objectives of the Study

The following objectives are laid down for the present study:

1. To study the nature of distribution of scores of senior secondary school students on attitude towards e-Learning with respect to:

   i) Gender

   ii) Locality

   iii) Stream

   iv) Type of School

2. To compare the attitude of senior secondary school students towards e-Learning with respect to: i) Gender ii) Stream iii) Type of School; and iv) Locality.

1-11 Hypotheses of the Study

The following hypotheses are framed for testing in the present study:

H_{01} Male Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{02} Female Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{03} Total Sample of Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{04} Rural Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{05} Urban Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{06} Arts Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{07} Science Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{08} Government Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{09} Private Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{010} Male and Female senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

H_{011} Arts and Science senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

H_{012} Government and Private senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

H_{013} Rural and Urban senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

1-12 Delimitations of the Study

The present study was delimited in the following aspects:

1. The state of Sikkim has four districts. The study was restricted to only one district i.e. East District of the state.

2. The study was delimited to the senior secondary school students only.

3. The study was confined to class XI students only.

CHAPTER 2

METHOD AND PROCEDURE

The objective of the present investigation was to study the attitude of senior secondary school students towards e-learning. To serve this purpose, it was requires to draw an adequate sample of senior secondary students; select suitable tool for measuring the characteristics under study; and collect the relevant data with the help of this tool. The details regarding these aspects of the study are given as under.

2-1 Method

The present study was aimed at studying the attitude of senior secondary students towards e-learning. The further purpose of the study was to collect detailed description of existing phenomena with the intent of employing the same to justify current conditions and practices and to make intelligent plans for improving them.

Hence, it was decided to use Descriptive Method of research in the present case which was relevant and justified in view of the objectives of the study.

2-2 Population

A population refers to any collection of specific group of human being or non-human entities such as objects, educational institutions and geographical areas. A population contains finite as well as infinite number of individuals. Population is properly defined so that there is no ambiguity as to whether a given unit belongings to the population. If a population is not properly defined, a researcher does not know what units to consider when selecting the sample.

In the present study, all the arts and science senior secondary school students of East District of Sikkim studying in Class XI constituted the population of the present study.

2-3 The Sample

Sampling is the basis of any scientific investigation. Since, in educational research it is neither practically expedient nor scientifically desirable to approach to the total population. Therefore, technique of sampling is employed in which instead every unit of population being tapped only a part of population is drawn and studied.

In the present study, the sample was drawn from the senior secondary school students. Due to paucity of time and limited scope the study, the colleges were selected on the basis of convenience and the sampled students were selected randomly keeping in mind the objectives of the study. The selected senior secondary schools are both Government and Private schools and are situated in East District of Sikkim. Finally, the total sample consisted of 400 (200 boys and 200 girls) students and the detail distribution of the sample selected for the present study given below.

TABLE 2.1: THE DISTRIBUTION OF THE SAMPLE

Sl. No.	Name of the School	Type of School	Gender		Total
			Male	Female	
1	Rumtek Senior Secondary School	Government	15	10	**25**
2	Dikling Senior Secondary School		15	10	**25**
3	Ranka Senior Secondary School		10	15	**25**
4	Bojoghari Senior Secondary School		10	15	**25**
5	Tadong Senior Secondary School		15	15	**30**
6	West Point Senior Secondary School		10	10	**20**
7	Kendraya Vidyalaya (KV)		10	10	**20**
8	Biraspati Parsai Senior Secondary School		15	15	**30**
9	Holy Sross School	Private	15	10	**25**
10	Paljor Namgyal Girls Senior Secondary School (PNG)		0	15	**15**
11	Tashi Namgyal Academy (TNA)		15	15	**30**
12	Greendale Senior Secondary School		20	10	**30**
13	St. Xavier School		20	15	**35**
14	St. Joseph School		10	15	**25**
15	East Point School		10	15	**25**
16	Bahai's Senior Secondary School		10	5	**15**
Total			**200**	**200**	**400**

2-4 Tool Used

Every scientific research is processed through certain well designed tools. Tools are nothing but the instrument that helps the researcher to gather data. In conducting research, an investigator resorts to some techniques or devices for gathering facts or data from the relevant field. These data gathering devices are called as research tools. To collect the requisite data for present study the investigator used an Attitude Scale towards e-L earning developed by Dimpal Rani. This scale contains 65 statements. Out of sixty five items thirty eight were positive and twenty seven were negative items.

Area-wise Distribution of items

The scale has four major areas, viz., 1. e-learning Interest, 2. Usefulness, 3. Ease of e-learning and 4. E-learning confidence. The 65 items (both positive and negative type) have been distributed in these four areas, as given in Table 2.2.

TABLE 2.2
Area-wise Distribution of Items

Sl. No.	Area	Nature of Items	No. of Items	Total No. of items	Total
I.	**e-learning interest**	Positive	1, 7, 21, 25, 40, 44, 50, 50, 59	**08**	**13**
		Negative	14, 18, 24, 29, 35	**05**	
II.	**Usefulness**	Positive	6, 8, 9, 12, 13, 16, 20, 26, 28, 30, 37, 45, 47, 51, 52, 60, 65	**17**	**26**
		Negative	4, 11, 17, 22, 23, 42, 54, 56, 59	**09**	
III.	**Ease of e-learning**	Positive	5, 10, 27, 36, 49,55, 61	**07**	**15**
		Negative	15, 33, 41, 43, 46, 48, 57, 64	**08**	
IV.	**e-learning Confidence**	Positive	3, 19, 31, 32, 62 63	**06**	**11**
		Negative	2, 34, 38, 39, 53	**05**	
Positive Items= 38+ Negative Items= 27				**Total Items**	**65**

Scoring System

The scale is a Five-point scale viz., Strongly Agree, Agree, Agree, Undecided, Disagree and Strongly Disagree. The scale has both positive and negative type items.

The scoring system is given in Table 2.3

TABLE 2.3

Scoring System

Sl No.	Type of Items	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I.	**Positive**	5	4	3	2	1
II.	**Negative**	1	2	3	4	5

The minimum and maximum possible scores are 65 to 325.

Reliability

The reliability of the scale was found out by Test-Retest method. For this, the scale was administered on a sample of 100 boys and girls, age group 14+ and on the same sample the scale was administered after a gap of one month. The coefficient of correlation found was +0.87 which is significant at 0.1 level of significance.

Validity

Content Validity of the items was ensured thorough rational logical analysis of the technology experts and teachers in questionnaire construction. Construct validity means that the test score are examined in terms of a construct. Correlation between total scores and item scores were also used for validity. This approach assumes that the total scores is valid; thus the extent to which the term correlation with the total score is indicative of construct validity.

Norms

On the basis of the statistical results, z-Score Norms have been prepared. Norms for interpretation of the level of e-learning have been given in Table 2.4.

TABLE 2.4

Norms for interpretation of the Level of e-Learning

Sl. No.	Range of z-Scores	Grade	Level of e-Learning
1.	**+2.01 and above**	**A**	**Extremely High**
2.	+1.26 to + 2.00	B	High
3.	+0.51 to + 1.25	C	Above Average
4.	**-0.50 to + 0.50**	**D**	**Average**
5.	-1.25 to -0.51	E	Below Average
6.	-2.00 to - 1.26	F	Low
7.	**-2.01 and below**	**G**	**Extremely Low**

2-5 Procedure for Data Collection

Keeping in view the objective of the present study the investigator had collected the data with the prior permission of the principal of the concerned senior secondary schools as mentioned in the table 2.1. The entire data collection was completed in one phase. First of all, the students were administered an attitude scale towards e-learning. It comprised 65 statements. The instructions were read out loudly. Thereafter, the students were asked to respond to the statement. After 40 minutes the scales were collected.

After completing the administration of the tool the investigator thanked the principal of the institution and the students for their whole hearted cooperation.

CHAPTER 4

REVIEW, CONCLUSIONS, EDUCATIONAL IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

In today's era of information and communication technology we are totally depending on new technology, and even our educational firms are benefiting highly on e-Learning to give information about their institutions. e-Learning is a relatively new concept implying learning by means of digital media such as computers, web pages, video conferences systems and D- ROMS. e-Learning covers a wide set of ICT technology based applications and processes, including computer-based learning, web- based learning, virtual classrooms and digital collaboration and networking. In recent years computers programs for e-Learning consisting of tools such as text, graphics, video, three dimensional object and animations have been developed. Though it is common insight that traditional learning is more efficient than e-Learning, the relevance of technology in Education has gained momentum and e-Learning has become a part of traditional teaching in majority of the universities and educational institutions. It foster great interaction and collaboration in the students and it accommodates multiple learning activities. In the rapid moving world, we can sustain only by making ourselves capable of racing with the pace of the time and technological progress. e-Learning is the demand of the time and we have to prepare our young students to tackle all the challenges they face in the modern technological life. Several studies have been conducted to examine attitude towards e-Learning all over the world. However, essentially it would seem that little research is done in this area at senior secondary

school students' level in Sikkim state. Hence, this study sought to determine senior secondary school students' attitude towards e-Learning.

4-1 Research Question

The present study was attempted to answer the following research question:

1. Do the senior secondary school students differ in their attitude towards e-Learning?

4-2 Objectives of the Study

The following objectives are laid down for the present study:

1. To study the nature of distribution of scores of senior secondary school students on attitude towards e-Learning with respect to:
   i) Gender
   ii) Locality
   iii) Stream
   iv) Type of School
2. To compare the attitude of senior secondary school students towards e-Learning with respect to: i) Gender ii) Stream iii) Type of School; and iv) Locality.

4-3 Hypotheses of the Study

The following hypotheses are framed for testing in the present study:

H_{01} Male Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{02} Female Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{03} Total Sample of Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{04} Rural Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{05} Urban Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{06} Arts Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{07} Science Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{08} Government Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{09} Private Senior Secondary school students do not differ in their level of attitude towards e-Learning.

H_{010} Male and Female senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

H_{011} Arts and Science senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

H_{012} Government and Private senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

H_{013} Rural and Urban senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

4-4 Operational Definition of Key Terms

The different key terms used in the title of the study and to be used in the body of study are operationally defined as follows;

1. Senior Secondary School Students- It connotes the students studying in class XI in East District of Sikkim.

2. Attitude towards e-Learning – In the present study attitude towards e-Learning refers to the individual's positive or negative feelings of participation in e-learning activities through computer use.

3. **Gender**- It connotes the students male and female.

4. Stream- It refers the students belongs to arts and science stream.

5. **Type of School**- It connotes the private and government senior secondary schools.

6. Locality: It refers the student belongs to rural and urban area.

4-5 Delimitations of the Study

The present study was delimited in the following aspects:

1. The state of Sikkim has four districts. The study was restricted to only one district i.e. East District of the state.

2. The study was delimited to the senior secondary school students only.

3. The study was confined to class XI students only.

4-6 Method

It was decided to use Descriptive Method of research in the present case which was relevant and justified in view of the objectives of the study.

4-7 The Sample

In the present study, the sample was drawn from the senior secondary school students. Due to paucity of time and limited scope the study, the colleges were selected on the basis of convenience and the sampled students were selected randomly keeping in mind the objectives of the study. The selected senior secondary schools are both Government and Private schools and are situated in East District of Sikkim. Finally, the total sample consisted of 400 (200 boys and 200 girls) students.

4-8 Tool Used

To collect the requisite data for present study the investigator used an Attitude Scale towards e-learning developed by Dimpal Rani. This scale contains 65 statements. Out of sixty five items thirty eight were positive and twenty seven were negative items.

4-9 Statistical Techniques Used

1) The objective number 1 aims at studying the nature of distribution of scores of selected samples of government and private senior secondary school boys and girls as well as total sample on the variable of attitude towards e-Learning. Hence, the technique of frequency distribution followed by bar and line diagrams was used in this case.
2) The objective number 2 aims at to compare the mean scores on the attitude of senior secondary school students towards e-Learning with respect to their gender, stream, locality and types of school. Hence the technique of t-test was used in this case.

4-10 Conclusions

On the basis of the item analysis the investigator of the present study arrived at the following findings which have been presented below;

1 Male Senior Secondary school students differ in their level of attitude towards e-Learning.

2 Female Senior Secondary school students differ in their level of attitude towards e-Learning.

3 Total Sample of Senior Secondary school students differ in their level of attitude towards e-Learning.

4 Rural Senior Secondary school students differ in their level of attitude towards e-Learning.

5 Urban Senior Secondary school students differ in their level of attitude towards e-Learning.

6 Arts Senior Secondary school students differ in their level of attitude towards e-Learning.

7 Science Senior Secondary school students differ in their level of attitude towards e-Learning.

8 Government Senior Secondary school students differ in their level of attitude towards e-Learning.

9 Private Senior Secondary school students differ in their level of attitude towards e-Learning.

10 Male and Female senior secondary school students differ significantly with respect to their attitude towards e-Learning.

11 Arts and Science senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

12 Government and Private senior secondary school students do not differ significantly with respect to their attitude towards e-Learning.

13 Rural and Urban senior secondary school students differ significantly with respect to their attitude towards e-Learning.

4-11 Educational Implications

The findings of the study have the following major educational implications which are thought to be essential for the development of attitude of senior secondary school students towards e-Learning.

1. Workshops, training programmes programmes for senior secondary school students should be organized for developing their attitude towards e-Learning.

2. The teachers and parents should motivate the students to get up to date knowledge by using e-Learning.
3. Findings of the study shows that male & female and rural & urban students differ in their attitude towards e-learning. Hence, Proper facilities should be arranged for them.
4. Emphasis should be given on providing necessary IT facilities so that students may use more and more e-Learning material in their teaching-learning process.

4-12 Suggestions for Further Research

On the basis of above findings, the investigator is inclined to have following suggestions for further research:-

1. Research can be conducted on more samples on state wise or district wise basis.
2. Research can be conducted on students belonging to different levels.
3. Research can be conducted on seeking the opinion of the teachers, administrators, stakeholders and parents for developing the attitude towards e-Learning among students in this regard.

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