STUDY OF FACTORS AFFECTING ONLINE LEARNING AMONG SENIOR SECONDARY STUDENTS

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Abstract

The COVID-19 pandemic, a public health crisis of worldwide importance, announced by the World Health Organization (WHO) in January 2020 as an outbreak, has made distance education through the E-learning system an urgent and irreplaceable requirement. The present study assessed factors affecting online learning among senior secondary students through questionnaires and interviews with 300 students who were subjects of the survey using the random sampling method. The study utilized the likert scale containing 44 items. Nine factors namely Technological Factor, Interaction with Teachers, Interaction with Peers, Understanding of Content/Content Knowledge, Family Environment, Social Factors, ICT Infrastructure, ICT Skills of Teachers, Nature of student were studied. Out of them Technological Factor, Interaction with Teachers, Interaction with Peers are significant and Understanding of Content/Content Knowledge, Family Environment, Social Factors, ICT Infrastructure, ICT Skills of Teachers, Nature of student were non significant.

Keywords: *Online Teaching, Online Learning, synchronous, asynchronous, Learning Outcomes.*

Introduction

The outbreak of COVID-19 was a significant event that pushed educational institutions to transition from the traditional classroom environment to the various online learning options. COVID-19 has affected all spheres of human life (Chang et al., 2020; Mokter, 2020; Wong et al., 2020), including the delivery of education and learning (Panesar et al., 2020; Laksana, 2021). To avoid the spread of COVID-19, the majority of the educational activities like

classroom teaching, seminars, conferences, workshops, etc., were either delayed or cancelled by the educational institutions (Khachfe et al., 2020; Patricia, 2020) till their online availability.

Online learning is the learning transferred through internet technologies by synchronous and asynchronous means. These modes help students interact with their teachers and colleagues while keeping a social distance (Dong et al., 2020). Online learning provides students with the opportunities to learn, interact, share their views, be independent in learning, and use time on their own (Azzi et al., 2021; Hwang et al., 2021). Using online technology to learn requires the students and teachers to have the ability to use technology to develop and maintain a sound social interaction (Andel et al., 2020). Apart from the effective use of technology, other factors such as the availability of suitable facilities, infrastructure and the financial state of the students also play an important role in online learning (Rusli et al., 2020; Laksana, 2021).

With the wide use of technology in today's learning environment, we should not anymore be concerned with finding out which is better, face-to-face or technology-enhanced instruction (Daley et al, 2001). In fact, student's experience with a course does not only entail the final grade but how much of the learning objectives have been attained. Online learning presents new opportunities to engage more with the students and student-centered learning, thereby enhancing the learning experience. Our primary goal should be whether students really learn with the intervention of online learning tools. If yes, what are the variables that contribute to the success of online learning tools? If no, then what is going wrong and how can we enhance the learning tool in question? To IADIS International Conference on Cognition and Exploratory Learning in Digital Age (CELDA 2006) 277 understand the process of learning using online learning tools, we need to identify the important variables that measure the learning outcome of students using a specific learning tool, and also the variables that help us understand students' learning experience with the learning tool.

As a result, the effectiveness of E-learning and students' online learning outcomes become a matter of concern for school in particular and the society in general. In fact, there has been a significant increase in research on factors affecting students' online learning outcomes. Online learning is a useful tool to overcome the challenges of the pandemic crisis in particular and other difficulties in general. However, many argued that online learning is an education crisis today. Most learners are not interested in online learning due to limited interactions, unstable sound and visual quality due to dependence on Internet quality, and technological

equipment not meeting demand. Therefore, this study aimed to factors affecting online learning among senior secondary students. Means and standard deviations were calculated for applying t-test on finding significant statistical difference between the responses by male and female senior secondary students.

Literature Review

Willis (**1994)** stated in his definition of distance learning identified the acquisition of knowledgeand skills as another criterion and supported the former three criteria by saying that distancelearning occurred through mediated information and instruction, and encompassed all technologies and other forms of learning at a distance.

Vonderwell and Zachariah (2005) explored the factors influencing learner's participation in two sections of a graduate online course. Findings indicated that online learner participation and patterns of participation are influenced by the following factors: technology and interface characteristics, content area experience,student roles and instructional tasks, and information overload. The case study approach was used to achieve a comprehensive and in-depth understanding of the factors influencing participation.It was observed that the students who were assigned specific roles maintained online presence throughout the discussions and participated more frequently than the rest of their group members.There is a need to develop pedagogically user-friendly online course interface and management systems. Research that investigates issues of interface design, learner participation patterns, and cognitive load in online learning can enable instructional designers and educators to design effective online learning.

Kira and Saade (2006)sought to explore several dimensions to online learning. The dimensions we explored are student's attitude, affect, motivation and perception of an Online Learning Tool usage.Identifying the dimensions to online learning entails important basic issues which are of great relevance to educators today. An exploratory factor analysis approach was followed to test the validity of the dimensions of online learning. The unreliable items in constructs are eliminated and not considered in the final solution of the factor analysis.

Khanna (2007) recommended communication between students, teachers and students communication, course design, course content, quality of teaching, and administrator support. As significant factors in successful E-learning.

Ellis (2009) opined that E-learning quality varies, and there are a few learning approach differencesbetween genders (male and female students).The relationship between learning

persistenceand student interaction in online learning environments revealed a moderating effect.Thereis a moderating effect on e-learning experience and relationship with the level of the courseand campus-based experience.Further, there is a relationship between theperceived usefulness and students' perceivedplayfulness with the moderating effect of e-learning content.

Khan (2016) conducted a study on E-learning for secondary and higher education sector and the study revealed that mix kind of research where most of the work has been performed on the adoption of E-learning. He also explored the challenges and investigated the rate of adoption of E-learning and its related experience.The findings showed that E- learning is successfully used for augmenting students' learning in education sector. It has been noticed that e-learning is more effective in teaching subjects such as Mathematics, Science and English and impact of e-learning is more evident where tools specific to teachers' everyday use were utilized.

Priyadrashini (**2018)** conducted a study on E-readiness of senior secondary school learnerstoonline learning transitions during lockdown. The study reveals that only 35% learnersfound online classes as effective as face-to-face classes. The delivery of online learning byteachers and digital skills of learners were found lacking.

Mishra (2019) conducted a study on online teaching learning in higher education during lockdown. The purpose of the study seeks to address the required essential of online teaching learning in education amid the COVID-19 pandemic. The study revealed that high quality digital academic experience, technology enabled learning for students to bridge the disparities originated in the education system before and after COVID-19 pandemic.

Rahmi (2019) Opined that a coherent structure of the application for e-learning makes students shift to online classes with greater enjoyment and satisfaction. Moreover, it is essential to give adequate training of technical skills to its course design and course content are associated with the quality of e-learning, e-learning plat-forms are tools for higher education in online classes.

Verma (**2019)** conducted a study on online education and school students to find outwhether in a secondaryschools, the teachers, students and parents are aware of the onlineeducation and are they willing to learn through online tuitions. The findings show that onlineeducation is not popular among the school going children, their parents as well as teachers.It is almost the last choice for them.

Aggarwal (2021) conducted a study to identify the factors affecting student satisfaction and performance regarding online classes during pandemic period of COVID- 19 and to establish the relationship between these variables. The results showed that Quality of instructer, course design, prompt feedback and expectations of students positively impact students satisfaction.The findings revealed that flexibility, cost-effectiveness, electronic research availability,easeof connection to the Internet, and well-designed class interface were students' positive experiences affecting their student satisfaction and performance during online classes.

Maheshwari (2021) To understand what factors have an impact on students' intentions to study online. 145 respondents were included and Structural Equation Model (SEM) was used for data analysis. The purpose was to understand what factors have an impact on students' intentions to study online. According to the findings perceived enjoyment must be increased in online learning and use of audios, videos and instant messaging should be increased. Mobile technology must be integrated further in online learning.

Boca (2021) students' behaviour and attitude towards online education in the pandemic was the main focus. A group of 300 students participated. There were four main concerns relating to individual characteristics, students' needs, students' knowledge. According to the findings teachers are those who adapt and reformulate their habits.

Saleem, Alnasrallah, Maik & Rehman (2022) study was conducted to evaluate the factors affecting the online learning process of students while taking the situational factors as a boundary condition (moderating variable). Data were collected through a Appendix Questionnaire administered to students studying in different universities in Pakistan. Stepwise linear regression and PROCESS Macro by Hayes (2013) was used for data analysis. Results revealed that university support, instructors' support, and motivational factors predicted the quality of online learning. The situational factors negatively influenced the relationship of instructors' support and motivational factors and the quality of online learning. University support and the quality of online learning relationships were not moderated by situational factors.

Objectives of the study

To compare the factors affecting online learning among male and female senior secondary students namely:
- Technological Factor
- Interaction with Teachers
- Interaction with Peers

- Understanding of Content/Content Knowledge

- Family Environment

- Social Factors

- ICT Infrastructure

- ICT Skills of Teachers

- Nature of student

Hypothesis of the study

There exists no significant difference between mean scores of factors affecting online learning among male and female senior secondary students namely:

- Technological Factor

- Interaction with Teachers

- Interaction with Peers

- Understanding of Content/Content Knowledge

- Family Environment

- Social Factors

- ICT Infrastructure

- ICT Skills of Teachers

- Nature of student

Research Method

Descriptive research was conducted and the likert scale was comprised of 44 items. Investigator used letters i.e. Strongly Agree (SA), Agree (A), Neutral(N), Disagree (D) and Strongly Disagree (SD) to indicate choices rather than numbers. It was a likert type scale where five alternatives were assigned for responding to each item, e.g. Strongly Agree (SA), Agree (A), Neutral(N), Disagree (D) and Strongly Disagree (SD). The numbers are assigned to each answer to do scoring Strongly Agree (SA) 5, Agree(A) 4, Neutral(N) 3, Disagree(D) 2, Strongly Disagree(SD) 1.

By calculating Mean and Standard deviation of each factor, Independent T-test is applied to know the significant difference between the two means of male and female students.

Scoring of all factors is shown where 160 are females and 140 are males. In this way we can come to know by rounding off the means that males and females are Strongly Agree(SA) , Agree(A), Neutral(N), Disagree(D) or Strongly Disagree(SD).

Keeping in view the current pandemic situation, the investigator used – online survey method for achieving the purpose of this study. An online survey is a set of structured questions that the respondent completes over the internet, generally through filling out a form. The data is collected and stored in a database, which was later evaluated. In order to know about factors affecting online education among senior secondary students in private schools of Amritsar City, the investigator used the following tool:

Questionnaire was designed by the investigator to collect the data from the respondents. The questionnaire included close ended questions. So, a questionnaire was made and was sent to each strata through e-mails with the prior permission from the Principals of the selected schools and also by interviewing each strata personally.

Table 1.1: Maximum and Obtained Scores of Male and Female Senior Secondary Students on Factors Affecting Online Learning

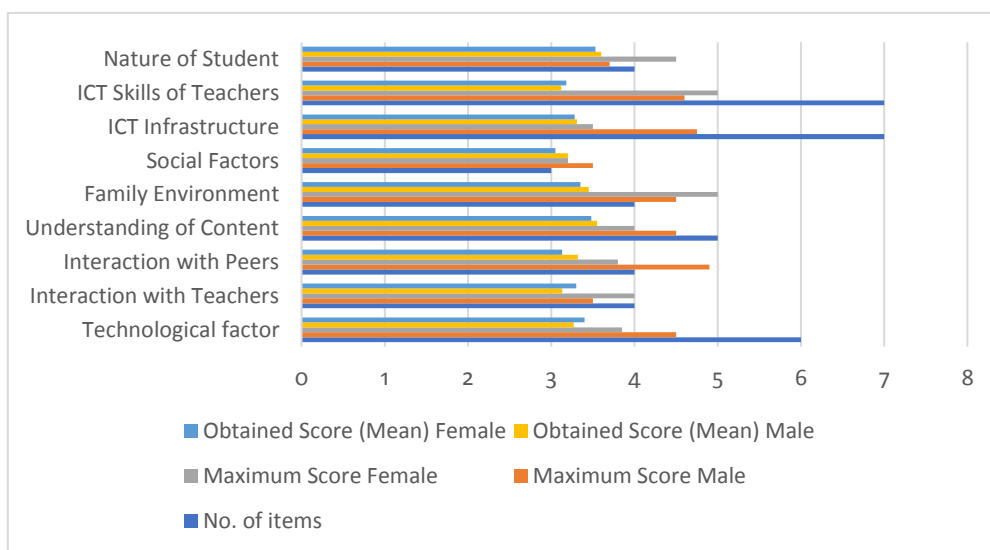| Factors	No. of items	Maximum Score		Obtained Score (Mean)	
		Male	Female	Male	Female
Technological factor	6	4.5	3.85	3.27	3.40
Interaction with Teachers	4	3.5	4	3.13	3.30
Interaction with Peers	4	4.9	3.8	3.32	3.13
Understanding of Content	5	4.5	4	3.55	3.48
Family Environment	4	4.5	5	3.45	3.35
Social Factors	3	3.5	3.2	3.20	3.05
ICT Infrastructure	7	4.75	3.5	3.31	3.28
ICT Skills of Teachers	7	4.6	5	3.12	3.18
Nature of Student	4	3.7	4.5	3.60	3.53

Fig. 1.1 The bar graph showing Obtained and Maximum score of male and female senior secondary students on factors affecting online learning.

The graph shows maximum and obtained scores of male female senior secondary students on factors affecting online learning. The number of items of each factor is also mentioned. For technological factors, Interaction with teachers and ICT Skills of teachers have the means of the female senior secondary students more than the male senior secondary students. This shows that there are the three factors which are effects more on females than male senior secondary students. Understanding content, family environment and nature of student are the factors where male senior secondary students are dominating over female senior secondary students.

Statistical Techniques Employed

Mean, standard deviation, and t-test has been employed to analyze the data.

1. t-value was calculated to find out the significant difference between the mean scores of technological factors during online learning between male and female senior secondary students.

2. t-value was calculated to find out the significant difference between the mean scores ofInteraction with Teachers as a factorduring online learning between male and female senior secondary students.

3. t-value was calculated to find out the significant difference between the mean scores ofInteraction with peers as a factor during online learning between male and female senior secondary students.

4. t-value was calculated to find out the significant difference between the mean scores ofUnderstanding of content/content Knowledge as a factor during online learning between male and female senior secondary students.

5. t-value was calculated to find out the significant difference between the mean scores of family Environment as a factor during online learning between male and female senior secondary students.

6. t-value was calculated to find out the significant difference between the mean scores ofSocial factors during online learning between male and female senior secondary students.

7. t-value was calculated to find out the significant difference between the mean scores of ICT Infrastructure as a factor during online learning between male and female senior secondary students.

8. t-value was calculated to find out the significant difference between the mean scores ofICT Skills of teachers as a factor during online learning between male and female senior secondary students.

9. t-value was calculated to find out the significant difference between the mean scores ofNature of Student as a factor during online learning among male and female senior secondary students.

Table 1.2: Significance /Non Significance of Factors Affecting Online Learning Among Male and Female Senior Secondary Students.

| Dimension	Gender	N	Mean	S.D.	df	t-value	Significant/Non significant
Technological factor	Male	140	3.27	0.55	298	2.6	Significant
	Female	160	3.40	0.56			
Interaction with Teachers	Male	140	3.13	0.56	298	3.4	Significant
	Female	160	3.30	0.52			
Interaaction With Peers	Male	140	3.32	0.61	298	2.71	Significant
	Female	160	3.13	0.74			
Understanding of Content	Male	140	3.55	0.62	298	1.16	Non-Significant
	Female	160	3.48	0.65			
Family Environment	Male	140	3.45	0.81	298	1.25	Non-Significant
	Female	160	3.35	0.71			
Social Factors	Male	140	3.20	1.01	298	1.59	Non-Significant
	Female	160	3.05	0.64			
ICT Infrastructure	Male	140	3.31	0.78	298	0.33	Non-Significant
	Female	160	3.28	0.83			
ICT Skills of Teachers	Male	140	3.12	0.66	298	0.85	Non-Significant
	Female	160	3.18	0.68			
Nature of Student	Male	140	3.60	0.56	298	1.0	Non-Significant
	Female	160	3.53	0.71			
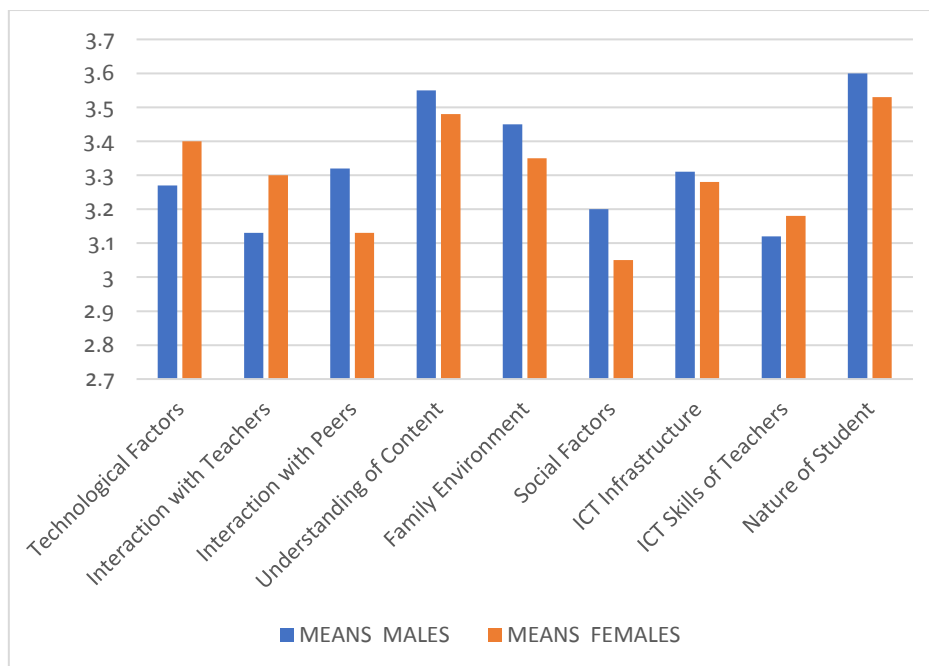
Fig. 1.2 The bar graph showingmean scores of male and female senior secondary students on factors affecting online learning.

The graph shows that for technological factors, Interaction with teachers and ICT Skills of teachers have the means of the female senior secondary students more than the male senior secondary students. This shows that there are the three factors which are effects more on females than male senior secondary students. Understanding content, family environment and nature of student are the factors where male senior secondary students are dominating over female senior secondary students.

Findings of The study

The main findings of the study can be summarised as below:

- There existssignificant difference between mean scores of technological factors affecting online learning among male and female senior secondary students. It means technological factors contributed more in female students as compared to male students.

- There exists significant difference between mean scores of Interaction with teachers affecting online learning among male and female senior secondary students. It means that Interaction with teachers as a factor contributed more in female students as compared to male students.

- There exists significant difference between mean scores of Interaction with peers affecting online learning among male and female senior secondary students. It means that Interaction with peers as a factor contributed more in male students as compared to female students.

- There exists no significant difference between mean scores of Understanding of content as a factors affecting online learning among male and female senior secondary students.

- There exists no significant difference between mean scores of Family Environment as a factor affecting online learning among male and female senior secondary students.

- There exists no significant difference between mean scores of Social factors affecting online learning among male and female senior secondary students.

- There exists no significant difference between mean scores of ICT Infrastructure as a factor affecting online learning among male and female senior secondary students.

- There exists no significant difference between mean scores of ICT Skills of teachers as a factor affecting online learning among male and female senior secondary students.

- There exists no significant difference between mean scores of Nature of Student as a factor affecting online learning among male and female senior secondary students.

Discussion of the Findings

According to the findings considering technological factors and Interaction with teacher there is a significant difference between the mean scores of male and female senior secondary students and female are dominating in this part. Whereas in Interaction with peers there is also a significant difference between the mean scores of male and female senior secondary students but male students dominate in this factor. Rest of the other factors like ICT Infrastructure, ICT skills of teachers and Nature of Student etc. are not statistically significant.

Educational Implications of the study

This study helps us to understand various factors affecting online learning among senior secondary students.

- Improving technology used in online learning will improve the consistency and regularity among the students.

- Increase in motivation and encouragement among teachers as well as students will help in increasing academic performance of the students.

- Dealing properly with the flexible schedule of online learning will reduce the pressure and increase the instructiveness between the teachers and students.

- Assessing the ability of students in dealing with sudden changes in their education system.

- Taking advantage in developing the education system by learning and summarising the trend in new methods of teaching and learning.

Suggestions

The suggestions for further study have been given below in the following statements:

- The present study was conducted on students, a study can be replicated on teachers.

- The present study was delimited to Amritsar district only, a study may be done on other cities also.

- The study can be undertaken with a large sample.

- A similar study may be carried out on the higher education.

- A comparative study may be conducted on boys and girls students with the students studying from PSEB and CBSE board.

- The present investigation is restricted to the schools, Amritsar district only. It could be conducted at universities, aided colleges, self-financed colleges.

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