ONLINE EDUCATION AND ACADEMIC ACHIEVEMENT OF PROSPECTIVE TEACHERS AT SECONDARY SCHOOLS IN KERALA: A CORRELATION STUDY

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ABSTRACT

In India, use of Internet in the field of Education has increased tremendously. Maximum educational institutes right from KG till PG are using online mode of education. Online mode of education can take India to higher virtues provided issues that are physical and technical are resolved. The aim of this study is to find out the relationship between E-learning Experience and Academic achievement of prospective teachers of secondary schools of Kerala. E learning experience consists of components like teaching presence, social presence and cognitive presence. The researcher used Normative Survey Method. The study is conducted on the population of prospective teachers in training colleges of Kerala. Stratified Random Sampling Technique are used on representative sample of 300 prospective teachers at secondary level (B.Ed). The Researcher used the Questionnaire to collect data. E-learning assessment tool is prepared and standardized by the investigator with the help of supervisor. Result of the study revealed that there was negative correlation between E- learning and Achievement of prospective secondary school teachers of Kerala

Key Words: Online Education, Prospective teachers, Teaching presence, social presence and Cognitive presence.

Introduction

Knowledge or education is obtained by learning. Earlier, very few methods of learning and teaching were developed and adopted. As the time passed, many new methods were invented and there occurred evolution of teaching and learning techniques. In the present 21st Century Technology has made significant impact our lives. It is difficult to stay away from technology. In this era, technology and education have become sides of the coin. The use of Internet in education is rising day by day and education is now turned into online education. Main motive behind online education was to make education accessible and easy for every learner. Online education is both synchronous and asynchronous in nature. Three main components of online education are cognitive presence, teaching presence and social presence.

Education can become transformative when teachers and students synthesize information across subjects and experiences, critically weigh significantly different perspectives, and incorporate various inquiries. Educators are able to construct such possibilities by fostering critical learning spaces, in which students are encouraged to increase their capacities of analysis, imagination, critical synthesis, creative expression, self-awareness, and intentionality.

Need and Significance of the Study

Considering the advancement of education and technology, the present generation is inculcating more towards technology and so the Education system. The present day education system makes use of different resources to make education more meaningful. In the present day conditions, the mode of education by which teachers teach and students learn is mainly online mode. So, it is very important to know what are the methodological, pedagogical or overall changes made by teachers to teach their students which is commonly called as teaching presence, at the same time it is very important to know how much students have understood or how they are building their knowledge based on the teaching method that commonly known as cognitive presence and how students are responding to the overall process that is commonly known as social presence. And overall how it is impacting the relation between students and teachers especially in teacher training schools. Because, teacher training schools create future generation of

teacher who will be the face of Education, and therefore it is need of hour to study the impact on teaching learning process through online education in teacher training colleges.

Statement of the Problem

Technology is very important in educational field. Online Education is gaining importance in today's Era. Online teaching and learning experience have already gained importance in western countries and have already studied its impact on academic achievement. In our country studies are going on and some studies are done limited to one particular state. In the state like Kerala, which one of the leading state in terms of high literacy rate in India, it is very important to know impact of online teaching – learning experience on academic achievement specially in case of prospective teachers. This study will help to know how successful is the process and how can it be standardized well in future, so that, we are on par with the world outside. In this paper a detailed study will be done, where, impact of online teaching learning process on academic achievement will be studied. This study will be carried out on prospective teachers in Kerala. Different training colleges will be chosen.

Outcome in any education system is determined by achievement tests. Achievement tests are used in educational and training settings. Standardized achievement tests are also used extensively in educational settings to determine whether students have achieved their specific learning. Generally, teachers use achievement test to measure attainment of their students.

In present study, influence of online teaching learning experience on academic achievement of perspective teachers of Kerala is studied. And the study is titled as: - ONLINE EDUCATION AND ACADEMIC ACHIEVEMENT OF PROSPECTIVE TEACHERS AT SECONDARY SCHOOLS IN KERALA: A CORRELATION STUDY

Operational Definitions

Online Teaching Learning Process: - Combined processes where an educator assesses learning needs, establishes specific learning objectives, develops teaching and learning strategies, implements plan of work and evaluates the outcomes of the instruction through online mode.

In this study online teaching learning process signifies the online classes given by the prospective teachers at secondary school levels in Kerala.

In this study in online education the following concepts will be explored: -

1) **Cognitive Presence:-** Cognitive presence is the extent to which learners are able to construct and confirm meaning through reflection and discourse and is defined as a four stage process of inquiry.
2) **Social Presence:-** The ability to project one's self and establish personal and purposeful relationships.
3) **Teaching Presence: -** Teaching presence is the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes.

Academic Achievement: - Knowledge attained or skill developed in the school subjects, usually designated by test scores or by marks assigned by teachers. (Kumar, 2010)

In the present study, Academic achievement is knowledge or skill that is developed in school subjects, which is designated by test scores or marks by teachers with respect to online teaching and learning process.

Hypotheses of the Study

Following are the hypothesis of the study: -

1. There is significant difference in the levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala.
2. There is significant difference in the level of dimensions of online teaching and learning experience namely cognitive presence, social presence and teaching presence among prospective teachers at secondary schools in Kerala.
3. There exist different levels in the academic achievement among prospective teachers at secondary

schools in Kerala
4. There is significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools in Kerala in total sample.
5. There is significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools in Kerala with respect to gender
6. There is significant relationship between the dimension of online teaching learning experience namely, cognitive presence, teaching presence and social presence, and academic achievement among prospective teachers at secondary schools in Kerala in total sample.

Objectives Of The Study
Following are the objectives of the study: -
1. To assess the level of online teaching and learning experience among prospective teachers at secondary school in Kerala.
2. To assess the levels of dimensions of online teaching and learning experience namely cognitive presence, social presence and teaching presence among prospective teachers at secondary schools in Kerala.
3. To assess the level of academic achievement among prospective teachers at secondary schools in Kerala.
4. To find out whether there is a significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools in Kerala in total sample.
5. To find out whether there is a significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools in Kerala with respect to gender
6. To find out whether there is a significant relationship between the dimension of online teaching learning experience namely, cognitive presence, teaching presence and social presence, and academic achievement among prospective teachers at secondary schools in Kerala in total sample.

Methodology In Brief
The investigator used Normative Survey Method. The study is conducted on the population of prospective teachers in training colleges of Kerala. Stratified Random Sampling Technique are used on representative sample of 300 prospective teachers at secondary level (B.Ed). The Researcher used the Questionnaire tool with few structured questions to collect data. Online teaching learning experience assessment tool is prepared and standardized by the investigator with the help of supervisor.

Variables Of The Study
Classificatory Variable:- Gender was considered as classificatory variable.
ANALYSIS AND INTERPRETATION
    Hypothesis 1

There is a significant difference in the levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala.
        The investigator estimated the number and percentage of prospective secondary school teachers Online Teaching Learning experience with different levels (higher level, average level and lower level) of the total sample (N=273) by calculating the mean and standard deviation. The standard deviation (σ) and mean (μ) of the scores are found to be 79.3 and 723 respectively. Students who obtained the scores above the value of $\mu + 1\sigma$ (802.3) were considered as the *high* group and who obtained the score below the value of $\mu - 1\sigma$ (643.7) were considered as the *low* group. The students who score lie between the value of $\mu + 1\sigma$ (802.3)and $\mu - 1\sigma$ (643.7) were considered as the average group. The percentage of the total sample falling into the three groups (*high*, *average* and *low*) is given in Table 1
Table 1

 Percentage analysis of the variable online teaching learning experience among prospective secondary school teachers of Kerala.

Level of Online Teaching Learning experience	Score	Number	Percentage
Higher	> 802.3	33	12.09%
Average	802.3 – 643.7	188	68.50%
Lower	< 643.7	53	19.41%

Table 1 indicates that in total sample of 273 prospective teachers 12.09 % of prospective teachers have higher level of online teaching learning experience, 68.50% of secondary teachers have Average level of online teaching learning experience and 19.41% of secondary teachers have low level of online teaching learning experience.

Discussion of results

The percentage analysis reveals that prospective secondary school teachers of Kerala differ in their level of Online Teaching Learning experience. Three different levels (high, average and low) of Online Teaching Learning experience were identified by the investigator. It also depicts that majority of prospective secondary school teachers of Kerala have average Online Teaching Learning experience (68.50%).The graphical representation (pie diagram) of the percentage of prospective secondary school teachers in Kerala with different levels of Online Teaching and learning experience for the total sample is given in fig. 1
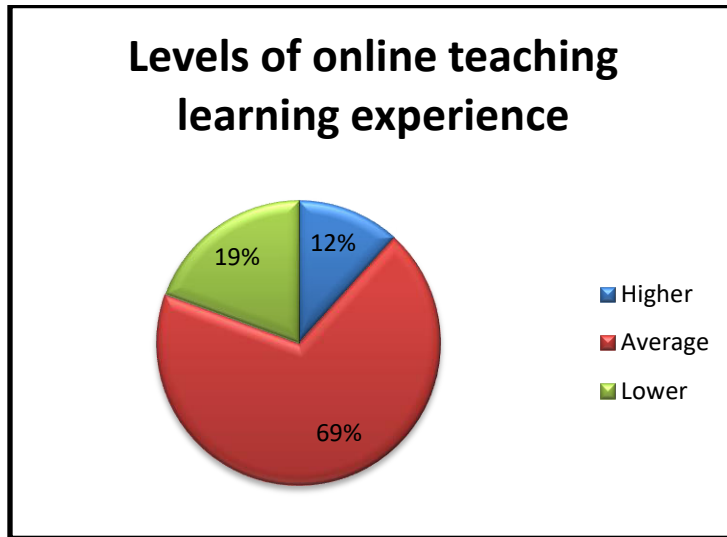

Figure 1: Pie diagram showing Percentage analysis of the variable online teaching learning experience among prospective secondary school teachers of Kerala.

From the table 1, it is evident that there exists significant difference in the levels of Online teaching learning experience of Prospective Secondary school teachers. The obtained data were further subjected to the treatment of ANOVA. The summary of the data and result obtained for the one way ANOVA for the level of online teaching learning experience of Prospective Secondary school teachers is given in table 2.

Table-2: *Summary of one-way ANOVA for level of performance of online teaching learning experience of Prospective Secondary school teachers*

Component	Source of Variation	Sum of Squares	Degrees of Freedom	Mean squares (Variance)	F value
Performance of Online teaching learning experience	Between Groups	1154571.33	2	577285.66	
					280.068
	Within Groups	556532.91	270	2061.23	

- Significant at 0.01 level

The F value is 280.068 which is greater than the table value for corresponding degrees of freedom at 0.01 level. This shows that there is a significant difference in the levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala.

Group difference in the awareness of levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala was calculated to know wherever the difference is significant. Scheffe's test was used for comparing the different groups with respect to levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala.

The mean scores of awareness of levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala were compared and the results were examined. Data and results obtained for comparison of mean scores levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala belonging to three groups are given in Table 3

Table 3: *Data and Results of the Scheffe's Test of multiple comparisons between means of levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala*

Sample	Groups compared	Mean	Mean Difference
Dimensions of scores of online teaching and learning experience among prospective teachers at secondary schools in Kerala	Average & Lower	733.26 611.70	121.56
	Higher & Lower	845.25 611.70	233.55
	Higher & Average	845.25 733.26	120.99

[*] **-** Significant at 0.01 level

From the table 1 it is clear that there exist significant difference between Higher, Average and Lower level students in of levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala.

Hence from the tables 1,2,3 and figure 1 it can be concluded that there is significant difference in the levels of Online teaching learning experience among prospective teachers at secondary schools in Kerala. Hence Hypothesis 1 is accepted. It is inferred that there exists significant difference in the levels of online teaching and learning experience among prospective teachers at secondary schools in Kerala.

Hypothesis 2
There is a significant difference in the level of dimensions of online teaching and learning experience namely cognitive presence, social presence and teaching presence among prospective teachers at secondary school in Kerala.
2(A) There is a significant difference in the level of dimensions of online teaching and learning experience namely cognitive presence among prospective teachers at secondary schools in Kerala

The investigator estimated the number and percentage of prospective secondary school teachers cognitive presence with different levels (higher level, average level and lower level) of the total sample (N=273) by calculating the mean and standard deviation. The standard deviation (σ) and mean (μ) of the scores are found to be 33.74 and 292.44 respectively. Students who obtained the scores above the value of

$\mu + 1\sigma$ (326.18) were considered as the *high* group and who obtained the score below the value of $\mu - 1\sigma$ (258.7) were considered as the *low* group. The students who score lie between the value of $\mu + 1\sigma$ (326.18) and $\mu - 1\sigma$ (258.7) were considered as the average group. The percentage of the total sample falling into the three groups (*high*, *average* and *low*) is given in Table-4

Table -4: *Percentage analysis of the Cognitive Presence among prospective secondary school teachers of Kerala.*

Level of Cognitive Presence	Score	Number	Percentage
Higher	> 326.18	29	10.62%
Average	326.18 – 258.7	190	69.60%
Lower	< 258.7	54	19.78%

Table 4 indicates that in total sample of 273 prospective teachers 10.62% of prospective teachers have higher level of Cognitive Presence, 69.60% of secondary teachers have Average level of Cognitive Presence and 19.41% of secondary teachers have low level of Cognitive Presence.

Discussion of results
The percentage analysis reveals that prospective secondary school teachers of Kerala differ in their level of Cognitive Presence. Three different levels (high, average and low) of Cognitive Presence were identified by the investigator. It also depicts that majority of prospective secondary school teachers of Kerala have average Cognitive Presence (69.60%).The graphical representation (pie diagram) of the percentage of prospective secondary school teachers with different levels of Cognitive Presence for the total sample is given in fig. 2
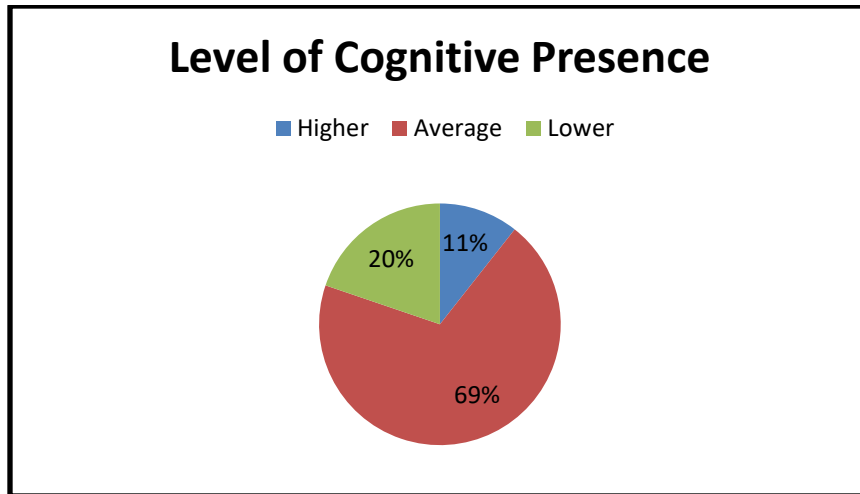

Figure2: Pie diagram showing Percentage analysis of the variable Cognitive Presence among prospective secondary school teachers of Kerala.

From the table 4 it is evident that there exists significant difference in the levels of Cognitive Presence of Prospective Secondary school teachers. The obtained data were further subjected to the treatment of ANOVA. The summary of the data and result obtained for the one way ANOVA for the levels of Cognitive Presence of Prospective Secondary school teachers is given in table 5.
Table 5: *Summary of one way ANOVA for level of performance of Cognitive Presence of Prospective Secondary school teachers*

Component	Source of Variation	Sum of Squares	Degrees of Freedom	Mean squares (Variance)	F value
Performance of Cognitive Presence	Between Groups	222152.354	2	111076.177	
					342.558
	Within Groups	87548.774	270	324.255	

- Significant at 0.01 level

The F value is 342.558 which is greater than the table value for corresponding degrees of freedom at 0.01 level. This shows that there is a significant difference in the levels of cognitive presence among prospective teachers at secondary schools in Kerala.

Group difference in the levels of Cognitive Presence among prospective teachers at secondary schools in Kerala was calculated to know wherever the difference is significant. Scheffe's test was used for comparing the different groups with respect to levels of cognitive presence among prospective teachers at secondary schools in Kerala.

The mean scores of awareness of levels of cognitive presence among prospective teachers at secondary schools in Kerala were compared and the results were examined. Data and results obtained for comparison of mean scores levels of cognitive presence among prospective teachers at secondary schools in Kerala belonging to three groups are given in Table 6

Table 6: *Data and Results of the Scheffe's Test of multiple comparisons between means of levels of Cognitive Presence among prospective teachers at secondary schools in Kerala*

Sample	Groups compared	Mean	Mean Difference
Dimensions of scores of cognitive presence among prospective teachers at secondary schools in Kerala	Average & Lower	298.24 243.07	55.17
	Higher & Lower	346.31 243.07	103.24
	Higher & Average	346.31 298.24	48.07

- Significant at 0.01 level

From the table 6, it is clear that there exist significant difference between Higher, Average and Lower level students in of levels of Cognitive Presence among prospective teachers at secondary schools in Kerala.

2(B) There is a significant difference in the level of dimensions of online teaching and learning experience namely Teaching presence among prospective teachers at secondary schools in Kerala.

The investigator estimated the number and percentage of prospective secondary school teachers teaching presence with different levels (higher level, average level and lower level) of the total sample (N=273) by calculating the mean and standard deviation. The standard deviation (σ) and mean (μ) of the scores are found to be 23.77 and 222.32 respectively. Students who obtained the scores above the value of $\mu + 1\sigma$ (246.09) were considered as the *high* group and who obtained the score below the value of $\mu - 1\sigma$ (198.55) were considered as the *low* group. The students who score lie between the value of $\mu + 1\sigma$ (246.09) and $\mu - 1\sigma$ (198.55) were considered as the average group. The percentage of the total sample falling into the three groups (*high*, *average* and *low*) is given in Table 7

Table 7: *Percentage analysis of the Teaching Presence among prospective secondary school teachers of Kerala.*

Level of Teaching Presence	Score	Number	Percentage
Higher	> 246.09	28	10.25%
Average	246.09 – 198.55	198	72.52%
Lower	< 198.55	47	17.21%

Table 7 indicates that in total sample of 273 prospective teachers 10.25% of prospective teachers have higher level of Teaching Presence, 72.52% of secondary teachers have Average level of Teaching Presence and 17.21% of secondary teachers have low level of teaching Presence.

Discussion of results
The percentage analysis reveals that prospective secondary school teachers of Kerala differ in their level of Cognitive Presence. Three different levels (high, average and low) of Cognitive Presence were identified by the investigator. It also depicts that majority of prospective secondary school teachers of Kerala have average Teaching Presence (69.60%).The graphical representation (pie diagram) of the percentage of prospective secondary school teachers in Kerala with different levels of Teaching Presence for the total sample is given in fig. 3
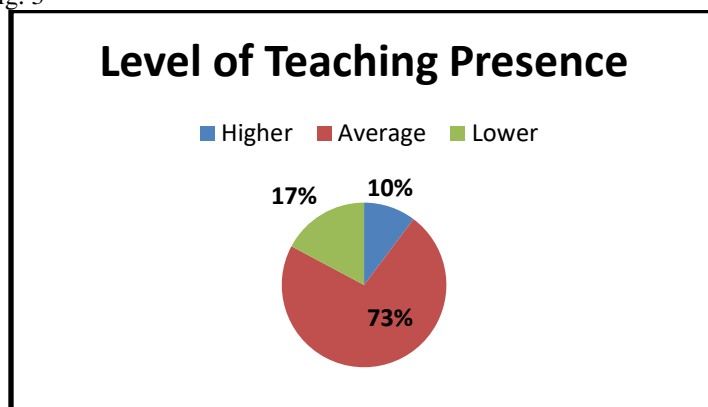

Figure 3 : Pie diagram showing Percentage analysis of the variable teaching presence among prospective secondary school teachers of Kerala.

From the table 7, it is evident that there exists significant difference in the levels of Teaching Presence of Prospective Secondary school teachers. The obtained data were further subjected to the treatment of ANOVA. The summary of the data and result obtained for the one way ANOVA for the levels of Teaching Presence of Prospective Secondary school teachers is given in table 8.

Table 8: *Summary of one way ANOVA for level of performance of Teaching Presence of Prospective Secondary school teachers*

Component	Source of Variation	Sum of Squares	Degrees of Freedom	Mean squares (Variance)	F value
Performance of Teaching Presence	Between Groups	107688.248	2	53844.124	
					316.257
	Within Groups	45968.660	270	170.254	

- Significant at 0.01 level

The F value is 316.257 which is greater than the table value for corresponding degrees of freedom at 0.01 level. This shows that there is a significant difference in the levels of Teaching presence among prospective teachers at secondary schools in Kerala.

Group difference in the awareness of levels of teaching presence among prospective teachers at secondary schools in Kerala was calculated to know wherever the difference is significant. Scheffe's test was used for comparing the different groups with respect to levels of teaching presence among prospective teachers at secondary schools in Kerala.

The mean scores of awareness of levels of Teaching presence among prospective teachers at secondary schools in Kerala were compared and the results were examined. Data and results obtained for comparison of mean scores levels of teaching presence among prospective teachers at secondary schools in Kerala belonging to three groups are given in Table 9.

Table 9: *Data and Results of the Scheffe's Test of multiple comparisons between means of levels of Teaching Presence among prospective teachers at secondary schools in Kerala*

Sample	Groups compared	Mean	Mean difference
Dimensions of scores of teaching presence among prospective teachers at secondary schools in Kerala	Average & Lower	225.67 185.34	40.33
	Higher & Lower	260.68 243.07	17.61
	Higher & Average	260.68 225.67	35.01

[*] **-** Significant at 0.05 level

From the table 9, it is clear that there exist significant difference between Higher, Average and Lower level students in of levels of Teaching Presence among prospective teachers at secondary schools in Kerala.

2(C) There is a significant difference in the level of dimensions of online teaching and learning experience namely Social presence among prospective teachers at secondary schools in Kerala

The investigator estimated the number and percentage of prospective secondary school teachers teaching presence with different levels (higher level, average level and lower level) of the total sample (N=273) by calculating the mean and standard deviation. The standard deviation (σ) and mean (μ) of the scores are found to be 27.93 and 208.03 respectively. Students who obtained the scores above the value of $\mu + 1\sigma$ (235.93) were considered as the *high* group and who obtained the score below the value of $\mu - 1\sigma$ (180.10) were considered as the *low* group. The students who score lie between the value of $\mu + 1\sigma$ (235.96)and $\mu - 1\sigma$ (180.10) were considered as the average group. The percentage of the total sample falling into the three groups (*high*, *average* and *low*) is given in Table 10

Table 10: *Percentage analysis of the Social Presence among prospective secondary school teachers of Kerala.*

Level of Social Presence	Score	Number	Percentage
Higher	> 235.96	51	18.68%
Average	235.96 – 180.10	179	65.56% 15.75%
Lower	< 180.10	43	

Table 10 indicates that in total sample of 273 prospective teachers, 18.68% of prospective teachers have higher level of Social Presence, 65.56% of secondary teachers have Average level of Social Presence and 15.75% of secondary teachers have low level of Social Presence.

Discussion of results

The percentage analysis reveals that prospective secondary school teachers of Kerala differ in their level of Social Presence. Three different levels (high, average and low) of Social Presence were identified by the investigator. It also depicts that majority of prospective secondary school teachers of Kerala have average Social Presence (65.56%).The graphical representation (pie diagram) of the percentage of prospective secondary school teachers with different levels of Social Presence for the total sample is given in fig. 5.9.
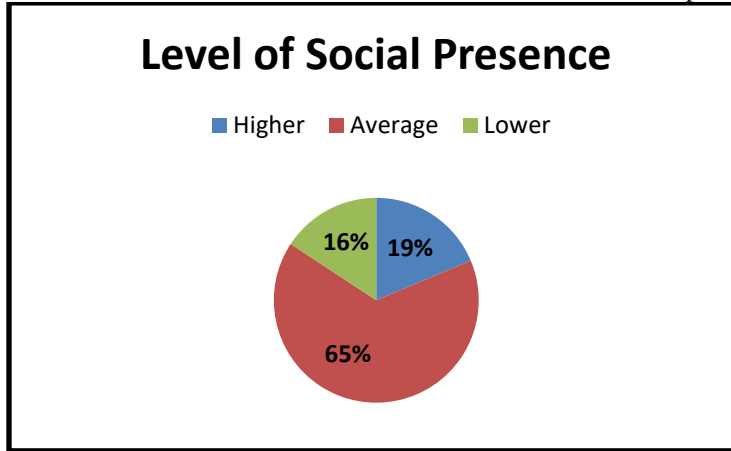

Figure 4: Pie diagram showing Percentage analysis of the variable Social presence among prospective secondary school teachers of Kerala.

From the fig 4, it is evident that there exists significant difference in the level of Social Presence of Prospective Secondary school teachers. The obtained data were further subjected to the treatment of ANOVA. The summary of the data and result obtained for the one way ANOVA for the level of Social Presence of Prospective Secondary school teachers is given in table 11

Table 11: *Summary of one way ANOVA for level of performance of Social Presence of Prospective Secondary school teachers of Kerala*

Component	Source of Variation	Sum of Squares	Degrees of Freedom	Mean squares (Variance)	F value
Social Presence of Prospective Secondary school teachers	Between Groups	121857.475	2	60928.738	219.314
	Within Groups	75010.005	270	277.815	

- Significant at 0.01 level

The F value is 219.314 which is greater than the table value for corresponding degrees of freedom at 0.01 level. This shows that there is significant difference in level of performance of Social Presence of Prospective Secondary school teachers in Kerala.

Group difference to assess performance of Social Presence of Prospective Secondary school teachers in Kerala was calculated to know wherever the difference is significant. Scheffe's test was used for comparing the different groups with respect to High, Average and Low performances of students

The mean scores of performance of Social Presence of Prospective Secondary school teachers in Kerala with respect to their level of performance (High, Average and Low) were compared and the results were examined. Data and results obtained for comparison of mean scores are given in Table 12

Table 12: *Data and Results of the Scheffe's Test of multiple comparisons between means of Total scores of Social Presence of Prospective Secondary school teachers in Kerala.*

Sample	Groups compared	Mean	Mean Difference
Dimensions of scores of social presence among prospective teachers at secondary schools in Kerala	Average	205.50	
	Low	171.26	34.24
	High	243.55	
	Low	171.26	72.29
	High	243.55	
	Average	205.50	38.05

 - Significant at 0.01 level

From the table 12, it is clear that there exist there exist significant difference between Higher, Average and Lower level students in of levels of Teaching Presence among prospective teachers at secondary schools in Kerala.

Discussion of Results
Hence from all the tables and figure it can be concluded that there is a significant difference in the level of dimensions of online teaching and learning experience namely cognitive presence, social presence and teaching presence among prospective teachers at secondary schools levels in Kerala.

Hence Hypothesis II is accepted. It is inferred that there exists a significant difference in the level of dimensions of online teaching and learning experience namely cognitive presence, social presence and teaching presence among prospective teachers at secondary schools levels in Kerala.

Hypothesis 3
There exist different levels in the academic achievement among prospective teachers at secondary schools in Kerala.

The investigator estimated the number and percentage of prospective secondary school teachers Academic Achievement with different levels (higher level, average level and lower level) of the total sample (N=273) by calculating the mean and standard deviation. The standard deviation (σ) and mean (μ) of the scores are found to be 79.3 and 723 respectively. Students who obtained the scores above the value of $\mu + 1\sigma$ (802.3) were considered as the *high* group and who obtained the score below the value of $\mu - 1\sigma$ (643.7) were considered as the *low* group. The students who score lie between the value of $\mu + 1\sigma$ (802.3)and $\mu - 1\sigma$ (643.7) were considered as the average group. The percentage of the total sample falling into the three groups (*high*, *average* and *low*) is given in Table 13

Table 13: *Percentage analysis of the Academic Achievement among prospective secondary school teachers of Kerala.*

Level of Academic Achievement	Score	Number	Percentage
Higher	> 645.90	52	19.05%
Average	645.90 – 552.10	182	66.67%
Lower	< 552.10	39	14.28%

Table13 indicates that in total sample of 273 prospective teachers 19.05% of prospective teachers have higher level of Academic Achievement, 66.67% of secondary teachers have Average level of Academic Achievement and 14.28% of secondary teachers have low level of Academic Achievement.

Discussion of results

The percentage analysis reveals that prospective secondary school teachers of Kerala differ in their level of Academic Achievement. Three different levels (high, average and low) of Academic Achievement were identified by the investigator. It also depicts that majority of prospective secondary school teachers of Kerala have average level of Academic Achievement (66.67%).The graphical representation (pie diagram) of the percentage of prospective secondary school teachers with different levels of Academic Achievement for the total sample is given in fig. 5.
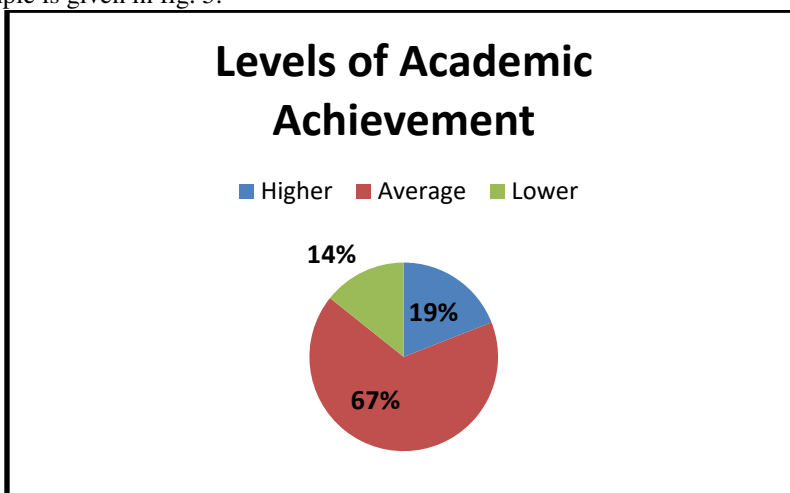

Figure 5: Pie diagram showing Percentage analysis of the variable Academic Achievement among prospective secondary school teachers of Kerala.

From the fig 5 it is evident that there exists significant difference in the level of Academic Achievement of Prospective Secondary school teachers. The obtained data were further subjected to the treatment of ANOVA. The summary of the data and result obtained for the one way ANOVA for the level of Academic Achievement of Prospective Secondary school teachers is given in table 14.

Table 14

Summary of one way ANOVA for level of performance of Academic Achievement of Prospective Secondary school teachers of Kerala

Component	Source of Variation	Sum of Squares	Degrees of Freedom	Mean squares (Variance)	F value
Academic Achievement of Prospective Secondary school teachers	Between Groups	121857.475	2	60928.738	219.314
	Within Groups	75010.005	270	277.815	

- Significant at 0.01 level

The F value is 219.314 which is greater than the table value for corresponding degrees of freedom at 0.01 level. This shows that there is significant difference in level of performance of Academic Achievement of Prospective Secondary school teachers in Kerala.

Group difference to assess performance of Academic Achievement of Prospective Secondary school teachers in Kerala was calculated to know wherever the difference is significant. Scheffe's test was used for comparing the different groups with respect to High, Average and Low performances of students The mean scores of performance of Academic Achievement of Prospective Secondary school teachers in Kerala with respect to their level of performance (High, Average and Low) were compared and the results were examined. Data and results obtained for comparison of mean scores are given in Table 15

Table 15: *Data and Results of the Scheffe's Test of multiple comparisons between means of Total scores of Acdemic Achievement of Prospective Secondary school teachers in Kerala.*

Sample	Groups compared	Mean	Mean Difference
Dimensions of scores of Academic Achievement among prospective teachers at secondary schools in Kerala	Average	595.64	
	Low	525.15	70.49
	High	665.27	
	Low	525.15	141.12
	High	665.27	
	Average	595.64	70.63

 - Significant at 0.01 level

From the table 5.20, it is clear that there exist there exist significant difference between Higher, Average and Lower level students in of levels of Teaching Presence among prospective teachers at secondary schools in Kerala.

Hence from the tables 5.18, 5.19, 5.20 and figure 5.10 it can be concluded that there is a difference in the academic achievement among prospective teachers at secondary schools levels in Kerala.

Hence Hypothesis 3 is accepted. It is inferred that there exists a difference in the academic achievement among prospective teachers at secondary schools levels in Kerala.

Hypothesis 4
There is a significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools in Kerala in total sample.

The relationship between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala was found out by using the Karl Pearson's product moment co-efficient of correlation. The details of the analysis are presented in table 16

Table 16: *Data and result of relationship between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala*

Variables	N	R	Significance (2-tailed)	Comment
Online Teaching Learning experience				
Academic Achievement	273	.032	.600	Not Significant.

Table 16 reveals that the correlation between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala is found to be 0.032. Correlation is not significant, where p value obtained is .600 (2-tailed) which is not significant at 0.05 level.

Discussion of results
From the above result, it can be inferred that the Online Teaching learning experience of prospective secondary school teachers in Kerala has a negligible positive relationship with the Academic Achievement which is not significant. This suggest that there is no significant relationship between online teaching

learning experience and academic achievement of prospective teachers at secondary schools levels in Kerala in total sample. Hence Hypothesis 4 is rejected.

This result is obtained because online mode of teaching learning activities started and both, teachers and students were new for this system of teaching and learning and takes more time to adapt to this system.

Hypothesis 5
There is a significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools in Kerala with respect to gender.

The relationship between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala with respect to gender was found out by using the Karl Pearson's product moment co-efficient of correlation. The details of the analysis are presented in table -17 and 18

Table- 17: *Data and result of Critical ratio of relationship between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala with respect to gender Male*

Variables	N	R	Significance (2-tailed)	Comment
Online Teaching Learning experience Academic Achievement (Male)	17	-.267	.300	Not Significant.

Table-17 reveals that the correlation between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala with respect to gender male is found to be -.267. Correlation is not significant, where p value obtained is .300 (2-tailed) which is not significant at 0.05 level.

Table -18: *Data and result of relationship between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala with respect to gender Female.*

Variables	N	R	Significance (2-tailed)	Comment
Online Teaching Learning experience Academic Achievement (Female)	256	.064	.307	Not Significant.

Table-18 reveals that the correlation between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala with respect to gender female is found to be 0.064. Correlation is not significant, where p value obtained is .307 (2-tailed) which is not significant at 0.05 level.

Discussion of results

From the above result, it can be inferred that the Online Teaching learning experience of prospective secondary school teachers in Kerala has a negative relationship with the Academic Achievement with respect to gender male. This suggests that there is inverse relation between them. More the online teaching learning experience less will be the academic achievement in total sample and vice versa.

But there is negligible positive relationship between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala with respect to gender female. This suggest that there is no significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools levels in Kerala with respect to gender female in total sample. Hence Hypothesis 5 is rejected.

The result is obtained because students are more distracted in online mode of teaching and learning specially the males as compared to offline mode of teaching and learning which is reflected in Academic Achievements. And this can be a cause of poor performance at Academic Achievement levels.

Hypothesis 6
There is a significant relationship between the dimension of online teaching learning experience namely, cognitive presence, teaching presence and social presence, and academic achievement among prospective teachers at secondary schools in Kerala in total sample.

The relationship between dimensions of Online Teaching Learning Experience namely cognitive presence, teaching presence and social presence, and Academic Achievement scores of prospective secondary school teachers in Kerala was found out by using the Karl Pearson's product moment co-efficient of correlation. The details of the analysis are presented in table 19, 20 and 21

Table 19: *Data and result of relationship between dimension Online Teaching Learning Experience namely cognitive presence and Academic Achievement scores of prospective secondary school teachers in Kerala*

Variables	N	R	Significance (2-tailed)	Comment
Online Teaching Learning experience (Cognitive Presence) Academic Achievement				
	273	.042	.491	Not Significant.

Table- 19 reveals that the correlation between dimensions of Online Teaching Learning Experience namely Cognitive Presence and Academic Achievement scores of prospective secondary school teachers in Kerala is found to be .042. Correlation is not significant, where p value obtained is .491 (2-tailed) which is not significant at 0.05 level.

Table- 20: *Data and result of Critical ratio of relationship between dimensions of Online Teaching Learning Experience namely, Teaching Presence and Academic Achievement scores of prospective secondary school teachers in Kerala*

Variables	N	R	Significance (2-tailed)	Comment

Variables	N	R	Significance (2-tailed)	Comment
Online Teaching Learning experience (Teaching Presence) Academic Achievement	273	.014	.822	Not Significant.

Table- 20 reveals that the correlation between Online Teaching Learning Experience and Academic Achievement scores of prospective secondary school teachers in Kerala with respect to gender female is found to be 0.014. Correlation is not significant, where p value obtained is .822 (2-tailed) which is not significant at 0.05 level.

Table -21: *Data and result of relationship between dimension Online Teaching Learning Experience namely, social presence and Academic Achievement scores of prospective secondary school teachers in Kerala*

Variables	N	R	Significance (2-tailed)	Comment
Online Teaching Learning experience (Social Presence) Academic Achievement	273	.035	.570	Not Significant.

Table-21 reveals that the correlation between dimensions of Online Teaching Learning Experience namely Teaching Presence and Academic Achievement scores of prospective secondary school teachers in Kerala is found to be .035. Correlation is not significant, where p value obtained is .570 (2-tailed) which is not significant at 0.05 level.

Discussion of results

From the above result, it can be inferred that the dimensions of Online Teaching learning experience namely, Cognitive Presence, Teaching Presence and Social Presence of prospective secondary school teachers in Kerala has a negligible positive relationship with the Academic Achievement which is not significant. This suggest that there is no significant relationship between dimensions of online teaching learning experience namely, Cognitive Presence, Social Presence and Teaching Presence and Academic Achievement of prospective teachers at secondary schools levels in Kerala in total sample. Hence Hypothesis 6 is rejected.

This result is obtained because online modes of teaching learning activities started full fledge for the first time in Kerala. Both, teachers and students were new for this system of teaching and learning and takes more time to adapt to this system. So, the teaching techniques (teaching presence), expected behavioural outcomes (Cognitive presence) and social awareness (Social presence) has not yet developed. More efforts must be taken on the side of teachers as well as students.

Conclusion

The present study is based on Community of Inquiry model in online teaching and learning and its relation to the Academic achievement. The study proves that there exists a significant level of online teaching and learning experience among prospective teachers of secondary school level in Kerala. Also there exsists significant difference in the level of dimensions of online Education namely cognitive presence, social presence and teaching presence among prospective teachers at secondary schools levels in Kerala. Based on this, different levels of academic achievement can also be seen.

There is no significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools levels in Kerala in total sample. Also, there is no significant relationship between online teaching learning experience and academic achievement of prospective teachers at secondary schools levels in Kerala with respect to gender in total sample. there is no significant relationship between dimensions of online teaching learning experience namely, Cognitive Presence, Social Presence and Teaching Presence and Academic Achievement of prospective teachers at secondary schools levels in Kerala in total sample.

This suggests that online teaching and learning activities and academic achievement are not related or have negligible correlation to other and in some cases it has negative impact. This may be because teachers as well as students need time and training to get adapted to this system of learning. So, the teaching techniques (teaching presence), expected behavioural outcomes (Cognitive presence) and social awareness (Social presence) has not yet developed.

Educational Implications
Based on the findings of the present study, certain recommendations can be formed which may of great practical value.

- The study shows that Online Education is not related with Academic Achievement. Proper steps must be taken by teachers to improve the online teaching learning experience and its reflection should be seen in Academic Achievement.
- Build a personal relationship with pupils. Instead of merely introducing yourself, consider doing a student survey. Then, while substituting your own replies to the questions, discuss the results with your pupils.
- Motivation is essential for effective learning, and the perceived relevance of the course is perhaps the single most important factor. As a result, it's critical to talk about the course's utility, value, and application right away. Help your students understand how your course will prepare them for more advanced courses, how it will assist them in acquiring specific skills, or how it will address issues that they find particularly interesting.
- Inability to focus is a major cause of student failure in online classrooms, a problem that has been worsened by the present health crisis. There are several dimensions to the attention problem. Many kids struggle to concentrate, priorities, organise their time, and remain on track without the framework of a typical school day. As a result, it's critical to provide them the structure they require. Make a list of the tasks that students must do each week. Make sure your instructions are simple to understand. Remind students of events, assignments, assessments, and due dates on a regular basis. Also, plan each class session around shorter tasks and sequences.
- Whether a conversation is held verbally, in breakout sessions, or via text, through chat or a discussion forum, make sure that it is truly beneficial to the students' learning.
  Brainstorming sessions, in which students present a variety of approaches to a topic or a problem; comprehension exercises, in which students assist one another in understanding a complex topic; critiques, in which students challenge a particular argument or interpretation; diagnoses, in which students deconstruct a problem; and sharing activities, in which students reveal the solution.
- Students' excitement and interest must be maintained because motivation tends to wane over time. Check for understanding, run surveys, and ask questions during individual sessions. Allow students to actively participate in class by asking them to raise a question in the chat or react to a question. Provide chances for active learning. Students should be asked to investigate an answer to a topic, evaluate a case study, or assess a text, a document, a video clip, or any other type of evidence.
- Teachers have to adopt different techniques to assess students' academic achievement. Efforts need to be taken by the Education Department and governments by providing proper infrastructure to the students as well as teachers, then only the Online teaching and learning program will be successful.
- It can also be concluded that the progress towards online Education have started but need catalyst to make the progress faster. The catalyst can be in form of government, teachers or students.

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