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Effectiveness of Online Learning for the Variables: Father's Annual Income and Mother's Annual Income

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Abstract

Online learning for teaching – learning process is one of the fastest growing technologies in technical education. Online learning is offering information from various resources which will be more useful for the learners to understand the subject in a better way. It also provides opportunity for the teachers and learners to interact with each other through e-mail, chatting etc., Online learners are increasing day by day due to effective e-learning materials available for the study. This research work was aimed to find out the effectiveness of online learning among Diploma in engineering students of Electronics and Communication Engineering and the interaction effect of online learning and the annual income of parents. The result showed that there is a value for online learning and no interaction between the teaching method and the annual income of parents.

KEYWORDS Online learning, Father's Annual Income, Mother's Annual Income

I .INTRODUCTION

Internet has a large number of websites, variable sources and e-learning materials etc., which act as good learning resources for the learners. E-learning or web-based instruction is being rapidly embraced by most universities across the world as such media of instruction are economical, convenient and disbursable to a larger audience (1). There are two types of online learning. One is Synchronous online learning and the other is Asynchronous online learning. Universities around the world have embraced with both synchronous and asynchronous delivery modes to a much wider and larger number of audiences simultaneously (2). In synchronous online learning,

the learners have to keep their timings and there is no flexibility in learning. But in asynchronous online learning, it provides flexibility to students and they can learn on their own time for learning in e-learning material, recorded videos and audios, etc., Asynchronicity gives students the ability to participate in the course when it is convenient for them to do so (3). This research work focuses on asynchronous learning method. It is very important to find the effectiveness of online learning among diploma in engineering students and also the impact of parent's annual income on online learning study for improving the future learning.

2. METHODOLOGY

(i) Treatment

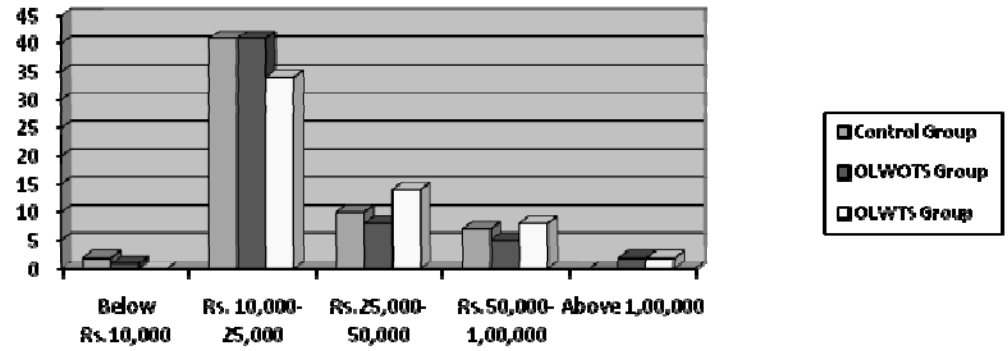
The study consists of three groups. 60 students each from Urban, Semi Urban and Rural area were grouped into three equal groups. The research study was done to Diploma in Electronics and communication Engineering students in VI semester in the year 2008. The results of V semester were published by Directorate of Technical Education at the time of introducing this experiment. So the achievement scores of the students in V semester Board Examination were taken for classification of groups. The Pretest-Posttest equivalent experimental group research design was adopted. The total sample size is 180.

(ii) Sampling

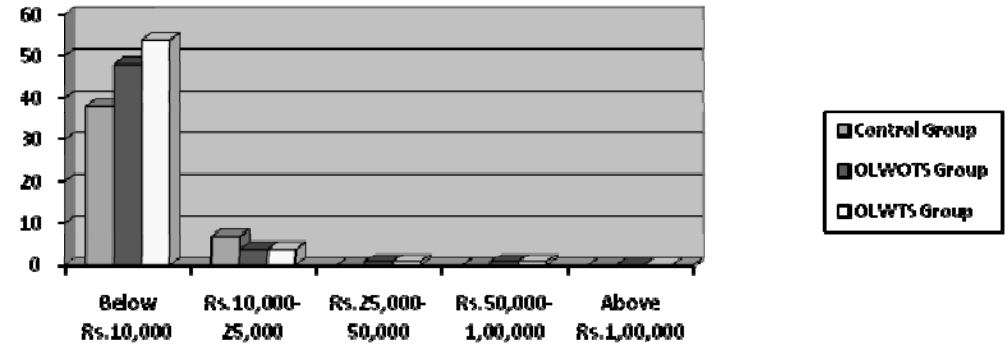
The distribution of the sample in the classification variable Father's Annual Income And Mother's Annual Income is shown in the Table 1 and the Graph 1 and Graph 2.

Table 1. Distribution of the sample Father's annual income and Mother's annual income

Variable	*Group*	*Distribution among groups*			*Total Number*
		Control group	OLWOTS Group	OLWTS Group	
Father's annual income	Below Rs.10,000	02	01	-	03
	Rs.10,000 –Rs.25,000	41	41	34	116
	Rs.25,000-Rs.50,000	10	08	14	32
	Rs.50,000-Rs.1,00,000	07	05	08	20
	Rs.1,00,000 and above	-	02	02	04
Mother's annual income	Below Rs.10,000	38	48	54	140
	Rs.10,000 –Rs.25,000	7	04	04	15
	Rs.25,000-Rs.50,000	-	01	01	02
	Rs.50,000-Rs.1,00,000	-	01	01	02
	Rs.1,00,000 and above	-	-	-	-



Graph 1. Shows the distribution of students based on Father's Annual Income



Graph 2. Shows the distribution of students based on Mother's Annual Income

3. RESULTS

a. Analysis of Pre-test scores

The critical F ratio with degrees of freedom 2 for the numerator and degrees of freedom 177 for the denominator significant at 0.05 is 3.04. The calculated F value 0.287 is less than the table value. Hence it is concluded that there is no significant difference between the means of the three groups. The F ratio clearly shows that the Group I – Control group, Group II – Online learning without teacher support group (OLWTS) and Group III – Online learning with teacher support group (OLWOTS) are almost equal with respect to Pre-Test scores.

b. Analysis of Post-test scores

i) Analysis of the post-test (post-treatment) scores

The term post-test has been used to denote the achievement test on the selected topic administered on the sample after the treatment. The Table 2 shows that the critical F ratio with degrees of freedom 2 for the numerator and degrees of freedom 177 for the denominator significant at 0.01 is 4.71. The calculated F value 40.511 is greater than the table value. Hence it is concluded that there is a significant difference between the means of the three groups. The F ratio resulted in rejecting the null hypotheses

namely there is no significant difference in achievement of diploma in engineering students respect to methods of teaching.

Table 2: ANOVA for the Post-Test Scores

Source	*Sum of Squares*	*df*	*Mean Square*	*F Ratio*	*Table Value*	*Significant*
Between groups	1173.144	2	586.572	40.511	4.71	0.01 Level
Within groups	2562.833	177	14.479			
Total	3735.978	179				

The Table 3 shows that the calculated t-value 5.314 is greater than the critical value 1.98 corresponding to the 0.01 level of significance for df = 118. This implies that the difference in the mean scores under consideration is significant. Therefore it is concluded that Group-I and Group-II differ significantly in their achievement in Post-Test scores conducted after the experimental study.

The Groups-I and II were given instruction through Traditional method of Lecturing and Online learning without teacher support method respectively. The above analysis proves that Group-II performed better than the control group. Hence one can emphatically say that Online learning without teacher support system is superior to the traditional method of Lecturing.

Table 3: t-test for post-test scores of Group-I and Group-II

Group	*N*	*Mean*	*Standard Deviation*	*t*	*df*	*Table value at 0.05 level*	*Significant*
Group-I	60	12.95	3.58	5.314	118	1.98	0.01 Level
Group-II	60	16.50	3.73				

The Table 4 shows that the calculated t-value 8.891 is greater than the critical value 1.98 corresponding to the 0.01 level of significance for df = 118. This implies that the difference in the mean scores under consideration is significant. Therefore it is concluded that Group-I and Group-III differ significantly based on achievement scores in Post-Test.

The Groups I and III were given instruction through Traditional method of Lecturing and Online learning with teacher support method respectively. The above analysis proves that Group-III performed better than the control group. Hence it is concluded Online learning with teacher support system is superior to the traditional method of Lecturing.

Table 4: t-test for post-test scores of Group-I and Group-III

Group	*N*	*Mean*	*Standard Deviation*	*t*	*df*	*Table value at 0.05 level*	*Significant*
Group-I	60	12.95	3.58	8.891	118	1.98	0.01 Level
Group-III	60	19.18	4.08				

The Table 5 shows that the calculated t-value 3.757 is greater than the critical value 1.98 corresponding to the 0.01 level of significance for df = 118. This implies that the difference in the mean scores under consideration is significant. Therefore it is concluded that Group-II and Group-III differ significantly based on achievement scores in Post-Test.

The Groups II and III were given instruction through online learning without teacher support system and online education with teacher support system respectively. The above analysis proves that Group-III performed better than Group II. Hence it is found that Online learning with teacher support system is superior to the Online learning without teacher support system.

Table 5: t-test for post-test scores of Group-II and Group-III

Group	*N*	*Mean*	*Standard Deviation*	*t*	*df*	*Table value at 0.05 level*	*Significant*
Group-II	60	16.50	3.73	3.757	118	1.98	0.01 Level
Group-III	60	19.18	4.08				

Putting the results of Tables 2, 3, 4 and 5 together, it is found that Online learning with teacher support and Online learning without teacher support systems are beneficial to the learners to achieve higher learning than the Traditional method.

In many studies, it was proved that online learning is equal or better to traditional method of teaching. Barbara et al.(4) stated that in experimental and quasi-experimental studies contrasting blends of online and face to face instruction with conventional face to face classes, blended instruction has been more effective. Carswell et al.(5) also stated that there is no significant difference exists between the student group in a conventional instruction that the Open University UK provides and student group taught exclusively through the internet. Chen-Yuan Chen and Wan-Lin Chung (6) proved that e-learning system is more interesting and positive among student groups. Niko's et al., (7) also found that online learning student's performance was better than other students.

From the above studies, it could be concluded that the Multimedia media material through online will be effective for all the learners in traditional and non-traditional class room set up.

ii. Interaction analysis of the variable - Father's Annual Income

Hypotheses 1 :

"There is no significant difference in achievement of the experimental group due to the interaction effect of treatment and the variable father's annual income".

The Two-way ANOVA for the Interaction of Treatment and Father's annual income on the achievement scores in Table 6 indicates the following.

1. The F-ratio for the treatment is 10.183 which is greater than the F-Limit at 1% level of significance. Hence it is concluded that the different treatments have significantly different effects on the achievement scores, the difference being significant at 1% level of confidence. It reveals that the Control group, OEWOTS group and OEWTS group have different achievement scores based on treatment.
2. The F-ratio for the Father's annual income is 0.476 which is less than the F - Limit at 5% level of significance. Hence it is concluded that there is no significant difference in the achievement scores due to the variable Father's annual income at 5% level of confidence. It reveals that there is no difference in achievement scores of students based on Father's annual income.
3. The F-Ratio for the interaction is 0.838 which is less than the F-Limit at 5% level of significance. Hence it is concluded that there is no significant difference due to the interaction of Treatment and the variable Father's annual income on the achievement scores even at 5% level of confidence. It reveals that there is no interaction effect on the achievement scores of students based on Father's annual income due to the treatment.

Hence the Null hypothesis is accepted.

Table 6 Two-way ANOVA for the Interaction of Treatment and Father's Annual Income on the achievement score

Source of variance	*Sum of squares*	*df*	*Mean square (MS)*	*F-ratio*	*Table value*	*Significant at*
Treatment	303.116	2	151.558	10.183	4.75	0.01 Level
Father's Annual Income	35.417	5	7.083	0.476	2.27	Not Significant at 0.05 Level
Interaction	74.819	6	12.470	0.838	2.16	Not significant at 0.05 Level
Within groups	2411.126	162	14.883			
Total		175				

R Squared = 0.342 (Adjusted R Squared = 0.289)

Why there is no difference in achievement scores of students based on Father's annual income? Whatever may be the income of Father, the students of all the groups performed in the same manner. It may be due to their self confidence in earning. Students from high status get money from parents for their expenses and few students from middle and low status go for part time job in the evening time and they earn their packet money. Some students go for work during week end and semester

holidays and they pay their tuition fee. So Parents income did not affect their achievement scores.

iii. Interaction analysis of the variable - Mother's Annual Income

Hypotheses 2 :

"There is no significant difference in achievement of the experimental group due to the interaction effect of treatment and the variable mother's annual income".

The Two-way ANOVA for the Interaction of Treatment and Mother's annual income on the achievement scores in Table 7 indicates the following.

1. The F-ratio for the treatment is 4.610 which is less than the F-Limit at 5% level of significance. Hence it is concluded that the different treatments have no different effects on the achievement scores at 5% level of confidence.It reveals that the Control group, OEWOTS group and OEWTS group have no different achievement scores based on treatment.
2. The F-ratio for the Mother's annual income is 1.874 which is less than the F - Limit at 5% level of significance. Hence it is concluded that there is no significant difference in the achievement scores due to the variable Mother's annual income at 5% level of confidence. It reveals that there is no difference in achievement scores of students based on Mother's annual income.
3. The F-Ratio for the interaction is 0.487 which is less than the F-Limit at 5% level of significance. Hence it is concluded that there is no significant difference due to the interaction of Treatment and the variable Mother's annual income on the achievement scores even at 5% level of confidence. It reveals that there is no interaction effect on the achievement scores of students based on Mother's annual income due to the treatment.

Hence the Null hypothesis is accepted.

Table 7 Two-way ANOVA for the Interaction of Treatment and Mother's Annual Income on the achievement score

Source of variance	*Sum of squares*	*df*	*Mean square (MS)*	*F-ratio*	*Table value*	*Significant at*
Treatment	127.633	2	63.816	4.610	4.75	Not Significant at 0.05 Level
Mother's Annual Income	77.826	3	25.942	1.874	2.66	Not Significant at 0.05 Level
Interaction	26.982	4	6.745	0.487	2.43	Not significant at 0.05 Level
Within groups	2062.410	149	13.842			
Total		158				

R Squared = 0.269 (Adjusted R Squared = 0.225)

Like Father's annual income, there is no difference in achievement scores of students based on Mother's annual income. All the students of three groups performed

in the same manner. Most of the student's mothers were not working or not earning more money. But the Mother's annual income did not have any impact on achievement scores.

4. CONCLUSION

Online learning brings all the sources of learning in front of us and it motivates the learners to learn and get better understanding of the concept. Understanding is very essential for studies and future carrier. It is found that Online Learning with Teacher Support and Online Learning without Teacher Support are superior over Traditional methods. When comparing with experimental methods, Online Learning with Teacher Support is superior to Online Learning without Teacher Support. There is no interaction effect between the treatment and Father's annual income and mother's annual income. The present study reveals that Diploma in engineering courses may be introduced through Online Education for the benefit of non-traditional and traditional learners.

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