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THE EFFECT OF CLASSROOM GAMES ON THE DEVELOPMENT OF SYNTACTIC STRUCTURES

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Abstract. *Motivating students to write is a major concern for language teachers. It is observed that the undergraduate students of Engineering tend to ignore this skill. With the growth of technology, the importance assigned to this skill has further weakened. Writing is limited to attempting examination questions, and evaluators assess the answers from the perspective of the acquisition of technical concepts and most often overlook the linguistic incompetence of the student. It is obvious that as second language learners of English, technical students have very little exposure to the English language and specifically to the skill of writing. In an attempt to develop appropriate writing strategies in students, an experiment was conducted in which tasks were designed to serve as a stimulus to generate writing in the classroom. The tasks designed were in the form of games, role-play activities which engaged the learners' interest and at the same time helped them to relax while learning. This study aims to investigate the syntactic structures students are capable of producing as a result of introducing such activities and games. Thus, these are analyzed and categorized from Entry level to Exit level of the experiment. The method of analysis of syntactic structures adopted is based on the approach of Kellogg Hunt (1969).*

Key words: *classroom, games, role-play activities, syntactic structures*

1. INTRODUCTION

Writing is one of the important parameters to determine the development of the acquisition of language. For the second language learners of English in India, writing is an important aspect for their academic achievement as well as for their professional growth. Over the years writing has been taught through grammar (Mellon 1969; Elley 1976; Hillocks 1986a; Tsang and Wong 2000), sentence combining (O'Hare, 1972; Faigley, 1979; and Morenburg *et.al.* 1978), model composition (Stein and Trabasso 1982), scales or guided revision, (Sager, 1973; Coleman, 1982), inquiry (Hillocks 1979, 1982; Troyka 1987) and free writing (Ganong, 1975; Gauntlett, 1978). The most important aspect in teaching writing is what the teacher intends to test and what aspects the teacher expects to improve in the learners' writing. Teachers tend to focus on different aspects of second language learner's competencies and teach them in ways that would help learners acquire that competency (Cumming, 2001; Hyland, 2002). Testing the learner's syntactic complexity has been one of the major areas for measuring the writing competency. The following section highlights the review in the area of syntactic complexity as one of the indexes to measure writing proficiency.

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2. Literature Review

Lourdes Ortega (2003) defines syntactic complexity as "the range of forms that surface in language production and the degree of sophistication of such forms". Testing writing competency in terms of analyzing the syntactic complexity of students in writing compositions was initiated by Kellogg Hunt (1965) whose concept of minimal terminal units or 'T' units is based on Chomsky's manifestation of the innate structure. Hunt terms this as a simple sentence. In his study, Hunt used the T-unit as the main measuring device to examine the syntactic development in the free writing of his subjects. The findings reveal that English-speaking children learn to use larger number of sentence-combining transformations per main clause in their writing. Hunt's concept was further used by O'Donnell, Griffin and Norris (1967), Mellon, (1969),; O'Hare, (1973); Combs, (1976); Daiker, *et al.* (1978); Morenberg,, *et al.* (1978), Faigley, (1979); Haswell, (1981); and Hudson, (2009). Hunt's study was also used as an impetus to analyse essays, poems and dialogues. Cynthia L. Hallen and Jennifer Shakespear (2002) adopted Kellogg Hunt's T-unit to analyse the poems of Emily Dickinson. The concept of T- unit has also been used as an important measure of testing writing proficiency in second language research (Arthur, 1979, Celce-Murcia and Santos, 1979; Perkins, 1980; Ferris and Politzer 1981; Foster & Tavakoli, 2009; Stockwell & Harrington, 2003; Ellis & Yuan, 2004; Beers & Nagy, 2009; Norrby 2007; Lu 2011; Haiyang Ai and Xiaofei Lu 2013; Wang and Slater, 2016.

Until recently this area was left unexplored in India. In 2015, Jennifer D'Souza investigated the quality of the difference between the written performance in English of students at standard V, VI and VII in terms of T-units. The students selected for her study were "average" IQ students learning English at English medium schools in Mumbai whose mother tongue was Marathi. These students mainly used Marathi and Hindi outside school. The writing tasks assigned to these students were discursive in nature, which provided scope for the students to use a variety of grammatical rhetorical patterns. She found that there was an increase in the mean length of single clause T-units from V to VI, but not from Standard VI to VII. The study further investigated the quality of the T-units produced in standard VI in terms of complexity. It was found that students at standard VI produce T-units with adverbial clauses more often than noun clauses and adjective clauses. The aim of this paper is to take the idea of analyzing the syntactic development in terms of T-units further and explore the writing composition of the undergraduate students of Engineering. In order to test the grammatical structures acquired by the learners the researcher has devised games, role play activities to motivate the learners to write.

Using games and role paly activities in the class to motivate learning is not a new concept. Games have been successfully used to motivate learning (Malone, 1980, 1981), understanding concepts (Wenger, 1998, Prensky, 2000; Gee, 2003; Shaffer, *et. al*, 2005; Squire, 2005; Prensky, 2007; Paul Kim, 2011; Farid Bahrami, *et. al*. 2012), improving vocabulary (Nguyen Thi Thanh Huyen,and Khuat Thi Thu Nga, 2003), learning English language (Kumar, Shirley, Mathur and Canny 2009). The challenge is to use games which include computer games, board games, physical games and role play activities in order to evaluate the learners syntactic development from the Entry to the Exit Stages. It is believed that such activities and games would not only help to arouse interest in learners, but also help them work together, collaborate and cooperate with each other. The very act of talking with friends in the class, sharing ideas and exchanging information is what makes learners happy and joyful. This makes learners become mature, responsible and thoughtful. It also

encourages learners to bond with others, think collectively, and focus on their goal. Games become challenging for learners as it includes the element of competition and in the process of attempting to win, they learn that hard work, concentration and dedication is necessary to accomplish success.

3. GAMES

The researcher has used a variety of games in order to develop an interest in the learners, keep them engaged in the activity as well as develop their syntactic development in writing. Such games included identifying the problem and finding solution to the given problem, an object which had to be modified, a set of pictures which had to be connected, a scene that had to be keenly observed and identified, a topic where students were expected to frame sentences to form a unified whole. These types of games were used as tools to help the learners develop their strategies of generalizations, description, analysis, narration, arguments as well as develop their fluency in writing. The same type of games was used during the course of experimentation with different data to develop the writing skill of the learners. The questions asked in the study are whether it is possible for students to improve in writing compositions when they are exposed to the target language without being conscious of learning the language? And secondly, whether it is viable to introduce games as a teaching methodology for the undergraduate students of Engineering?

4. HYPOTHESES

1. There will be a significant difference in the number of error-free T-units produced between Experimental group and Control group from the Pre-test to the Post-test.
2. Experimental group exposed to games that enable them to acquire the strategies of generalization, description, analysis, narration and argument will produce more adverbial clauses of reason in writing in comparison with Control group.

5. METHODOLOGY

Regular classroom periods were used to obtain the data and students were not informed that their work would be used for a research study, in order to get unbiased data. Three hundred students were randomly drawn from five Engineering colleges in Navi Mumbai in 2016 for the experiment in game-based learning. These students were selected from the First Year of the undergraduate course and were in the age group of 18 to 19 years. From these would be formed two similar batches, one the Experimental Group which would be given the experimental treatment, and the other, the Control Group, which would be similar, except in the treatment given. As the experimental treatment was the development of proficiency in English through the medium of games, the level of English ability had to be the same at starting point, in order to determine whether the experimental group students, if their scores improved, had benefitted specifically from the course given to them. So, a test was designed to establish whether this was so. It was considered that a test of reading comprehension would be adequate to determine general ability levels. This test consisted of passages with questions based on

Lukmani's (1982) taxonomy of cognitive skills involved in reading, namely Identification, Interpretation and Analysis. The Analysis of Variance (ANOVA), a statistical test, was conducted on the results to determine whether the students of the five colleges were at the same level of English ability. The ANOVA results indicated that there was a significant difference in the levels of the students in four of the five Engineering colleges which are here called Colleges A, B, C, and D. The results of College E, however, indicated that the students were at the same level as those of College A, and thus, both colleges A and E could be used in the experiment (see Table 1).

Table 1 Comparative analysis of reading test

College A			College E			
N=135	Total scores	Mean scores	N=135	Total scores	Mean scores	*F*-value
	1001	7.41		1002	7.42	0.002*

Two matched groups were needed for the study. Two hundred and twenty students were randomly chosen from the First Year of College A and E to constitute the Experimental group. Another 220 students were randomly drawn, specifically from the First Year of Engineering from College E to constitute the Control group. Because of irregularity in attendance, and in the case of some students dropping out of the course altogether, the number of students which could be used in the final analysis got reduced. Thus, the number of students in Experimental and Control Groups were reduced to 201 each.

The *F* value is the ratio of the two sources of variance-between-groups variance over within-group variance. If the observed value of *F* is equal to or larger than the critical value which is shown in the Table, it indicates that there is a difference in the two groups. Likewise, if the observed value of *F* is less than the critical value, it indicates that there is no difference in the groups. In Table 1 the observed value of *F* is 0.002, which is less than the critical value of *F* that is 6.85 at the .01 level of significance. It can be concluded that there is no difference in Colleges A and E.

5.1. Data analysis

The students were exposed to two hours every week of game-based learning, that is, 20 hours in all. At the end of the experiment, a writing activity was conducted for the students for the purpose of data collection. This activity was timed, unlike the other writing activities conducted in the class, where some amount of relaxation was given while completing the activities. They were given five minutes to organize their ideas before the commencement of the activity. Some of the topics given included 'Favourite book', 'Holiday trip', 'Indian festivals', etc.

The data was then analysed in terms of T- units. A T- unit as seen earlier is defined as 'the main clause plus subordinate clauses attached to or embedded in them'. For the purpose of this study only those T-units were considered that were grammatically and lexically correct and free from incorrect spellings.

In the present study, twenty-four syntactic complexity indicators were evaluated for the spoken and written data. These syntactic complexity indicators were classified into several groups. The first group included the analysis of the sentence structure. This included the subordinating structures, coordinating structures and the type of sentences produced. The second group formed the length of production units, namely the mean length of sentence,

mean length of T-unit, and mean length of clause. The third group included the analysis of dependent clauses, coordinate phrases, subordinate phrases and complex nominals per clause produced. The fourth group consisted of the analysis of the adverbial clauses used. The specific indices are discussed in the following section. Tests in written mode were given at the beginning and end of the course dealing with the selected parameters for Experimental Group and Control Group.

5.2. The statistical test used

The Analysis of Variance test was the main statistical tool used in the comparison of mean scores. The performance of Experimental Group and Control Group were compared on the categories of grammar selected for the analysis, on the basis of their mean scores. This was done both at the pre-test and post-test. Their mean scores at the beginning of the course were compared to their mean scores at the end of the course to test the extent of their progress.

5.3. Results

Result of error-free T-units, subordinating and coordinating structures
In this group the syntactic complexity indicators include:
The number of main clauses per sentence, (MC/S),
The number of main clauses per T-unit, (MC/T),
Dependent clauses per sentence, (DC/S),
Dependent clauses per T-unit, (DC/T),
T-units per sentence, (T/S),
Number of simple sentences per T-unit, (SS/T),
Number of compound sentences per T-unit, (Comp S/T),
Number of complex sentences per T-unit, (CXS/T), and
The number of compound/complex sentences per T-unit (Comp/CXS/T).

The total number of words produced by Experimental Group and Control Group at the Entry and Exit point in writing was (19424 Entry, 22441 Exit) and (19421 Entry, 9069 Exit) respectively. Tables 2 and 3 show the comparison of means of Experimental Group and Control Group at the Pre- and Post-tests respectively.

Table 2 Comparison of performance of experimental and control group written language production pre-test

Subordinate and coordinate syntactic complexity	N=201 Exp. grp.	S.D	N=201 Control grp.	S.D	*F*-value
Main clauses per Sentence (MC/S)	7.05	3.35	4.46	1.84	92.62*
Dependent Clauses per Sentence (DC/S)	3.21	2.25	1.14	1.16	134.53*
Main Clauses per T-unit (MC/T)	3.58	2.6	4.24	1.83	8.70*
Dependent Clauses per T –unit (DC/T)	1.61	1.71	1.07	1.09	14.08*
T-units per Sentence (T/S)	4.73	2.66	4.50	2.04	0.97
Simple Sentences per T-unit (SS/T)	2.74	2.24	2.44	1.52	2.44
Compound sentences per T-unit (CompS/T)	0.67	0.85	0.25	0.56	33.69*
Complex sentences per T-unit (CXS/T)	1.13	1.17	0.80	0.88	15.60*
Compound/ Complex Sentences per T-unit (Comp CXS/T)	0.18	0.48	0.60	0.81	40.84*

*p<.01

Table 2 shows that the Experimental group produced an average of 4.73 T-units and Control group produced an average of 4.50 T-units. There is no difference in the number of T-units produced in the Pre-test as indicated by the ANOVA test with an *F* value of 0.97 which is less than the critical value (*F*=6.70). A comparison of the T/S in the Post-test (Table 3) indicates that the Experimental group has shown an improvement from the Pre- to the Post-test (Mean=4.73, Pre-test, Mean=6.73, Post-test). This is not the case with Control group where the mean of T/S have dropped from 4.50 in the Pre-test to 2.91 in the Post-test.

Table 3 Performance of experimental and control group written language production post-test

Subordinate and coordinate syntactic complexity	N=201 Exp. grp.	S.D	N=201 Control grp.	S.D	*F*-value
Main Clauses per Sentence (MC/S)	10.63	2.6	3.41	2.17	911.17*
Dependent Clauses per Sentence (DC/S)	3.33	1.88	1.11	0.93	222.9 *
Main clauses per T-unit (MC/T)	8.42	2.15	3.37	2.18	472.66*
Dependent Clauses per T-unit (DC/T)	2.46	1.58	1.1	0.94	110.36*
T-units per Sentence (T/S)	6.73	16.88	2.91	5.18	399.88*
Simple Sentences per T-unit (SS/T)	3.6	2.21	1.37	1.3	151.97*
Compound Sentences per T-unit (Comp S/T)	1.04	0.98	0.18	0.45	1.41.27*
Complex Sentences per T-unit (CXS/T)	1.61	1.26	0.8	0.73	63.11*
Compound/ Complex Sentences per T-unit (Comp/CXS/T)	0.47	0.66	0.57	0.81	126.88*

*p<.01

The differences in the number of T-units produced by Experimental group from the Pre- to the Post- tests in Tables 2 and 3 show that there is a statistical significance as indicated by the ANOVA test with an *F* value of 74.53. This indicates the syntactic development of the Experimental group. The first hypothesis which says that *there will be a significant difference in the number of error-free T-units produced by Experimental Group from the Pre-test to the Post-test in comparison to the Control group* is supported.

Again, Experimental group produced more numbers of dependent clauses per sentence as well as dependent clauses per T unit (645/sentence, 323/T unit Pre-test, 669/ sentence and 494/T unit Post-test), which is significantly higher than Control group (229/sentence, 215/T unit Pre-test, 224/sentence and 221/T unit, Post-test). The embedding of sentences is an example of complexity and it can be therefore said that students who were exposed to game-based learning have shown a significant difference in the use of subordination as a complexity measure. This also holds true with complex sentences where Experimental group has produced 228 at the Pre-test to 324 complex sentences at the Post-test in comparison to 160 complex sentences by Control group at both Pre-test and Post-test. This difference is significant as indicated by the ANOVA test with an *F* value of 100.87. This difference indicates that written language has indeed become more complex and this can be attributed to task design (game-based learning). The difference is also seen in coordinating structures where Experimental group has produced a significantly higher number of compound sentences from Pre to the Post-tests in comparison with Control group (135 Pre-test 209 Post-test Exp. grp. and 51 Pre-test 37 Post-test Control grp). The difference is significant as indicated by the ANOVA test with an *F* value of 28.42. In terms of the density

of subordination and coordination, the Experimental group use more of subordination as well as coordination in comparison with Control group. The significant difference in subordination and coordination indicates that with game-based learning the complexity of sentence structure increases.

Results of syntactic length units

The length units in syntactic complexity measurement include
Mean Length of Sentence (MLS),
Mean Length of T-unit (MLT),
Mean Length of Clause (MLC),
Mean Length of Simple Sentences (MLSS),
Mean Length of Compound Sentences (MLComp.S),
Mean Length of Complex Sentences (MLCXS), and
Mean Length of Compound/Complex Sentences (MLComp/CXS).

Table 4 shows the analysis of length of production units of the Experimental and Control group at the Pre-test. Out of the total syntactic complexity indicators to measure syntactic lengths, the average length of sentences, the average length of compound sentences and the average length of complex sentences produced by Control group students is much lower as compared to Experimental group, and the differences have statistical significance as indicated by the ANOVA, test, with a *F* value of 309.84, 15.09, 154.17 respectively.

However, in the parameters of mean length of T- units and the mean length of Compound /Complex sentences produced, Control Group have scored higher over the Experimental Group at the Entry point. In the other parameters both the groups are at the same level with an *F* value of 0.61 (ML/C) and 0.95 (ML/SS) which is not significant.

Table 4 Performance of experimental and control group written language production pre-test

Length of production units	N=201 Exp. Grp.	S.D	N=201 Control Grp.	S.D	*F*-value
Mean Length of Sentences (ML/S)	96.73	29.90	52.39	19.52	309.84*
Mean Length of T-units (ML/T)	33.26	22.40	49.24	19.57	57.94*
Mean Length of Clauses (ML/C)	49.97	24.69	41.93	16.00	0.61
Mean Length of Simple Sentences (ML/SS)	21.15	16.56	22.66	14.36	0.95
Mean Length of Compound Sentences (ML/Comp)	9.73	12.42	4.42	9.00	15.09*
Mean Length of Complex Sentences (ML/CXS)	16.56	17.97	15.06	17.50	154.17*
Mean Length of Compound/ Complex Sentences (ML/Comp/CXS)	3.83	11.20	10.23	13.76	24.77*

*p<.01

In Table 5 the length of production units of the Experimental and Control group at the Post-test, shows that in the parameters of average length of sentences, average length of clauses, the average length of T units, the average length of simple sentences, the average length of compound sentences and the average length of complex sentences produced by Control group students is much lower as compared to Experimental group, and the differences have statistical significance as indicated by the ANOVA, test, with a *F* value

of 652.69, 202.49, 420.33, 64.9, 90.04, 30.04 respectively. There are also differences between the average length of compound/complex sentences produced, but with an *F* value of 0.48, where there is no statistical difference.

Interestingly, in the average length of compound/complex sentences produced from the Pre-test to the Post-test, the Experimental group has shown a significant difference as indicated in their mean scores (3.83 Pre-test, 10.23 Post-test), as well as the ANOVA test with an *F* value of 26.18.

Table 5 Performance of experimental and control group written language production post-test

Length of production units	N=201	Exp. grp.	S.D	N=201	Control grp.	S.D	*F*-value
Mean Length of Sentences (MLS)		111.65	25.19		45.12	27.37	652.69*
Mean Length of T-units (MLT)		79.16	20.25		44.98	27.41	202.49*
Mean Length of Clauses (MLC)		85.40	23.61		36.44	24.27	420.23*
Mean Length of Simple Sentences (MLSS)		29.64	19.03		15.65	15.62	64.9 *
Mean Length of Compound Sentences (MLComp)		15.02	14.8		3.52	8.74	90.04*
Mean Length of Complex Sentences (MLCXS)		23.52	19.01		14.29	14.17	30.4 *
Mean Length of Compound/Complex Sentences (MLComp/CXS)		10.23	14.41		11.27	15.66	0.48

*p<.01

Results of dependent clauses, phrases and complex nominals

Tables 6, 7, 8 and 9 show the analysis of phrases and clauses respectively. An analysis of coordinate and subordinate phrases shows that students of Control group produce lower number of coordinate and subordinate phrases than Experimental group from the Pre- to the Post-tests and this difference has statistical significance as indicated by ANOVA where the calculated value of *F* value is more than the critical value of *F* as shown in Tables 6 and 7.

Table 6 Comparison of performance of experimental and control group written language production pre-test

	N=201	Exp. Grp.	S.D	N=201	Control Grp.	S.D	*F*-value
Mean Coordinate Phrases (MCP)		3.08	1.90		1.75	1.52	59.96*
Mean Subordinate Phrases (MSP)		2.40	1.89		1.14	1.17	64.21*
Mean Complex nominal (MCN)		1.11	1.51		1.23	1.35	0.76
Mean Adverbial Clauses (MAdvC)		0.82	1.01		1.84	1.39	0.62
Mean Adjective Clauses (MAdjC)		0.24	0.52		0.17	0.44	1.74
Mean noun Clauses (MNC)		0.40	0.69		0.46	0.75	0.69

*p<.01

Table 7 Performance of experimental and control group written language production post-test

	N=201	Exp. grp.	S.D	N=201	Control grp.	S.D	*F*-value
Mean Coordinate Phrases (MCP)		4.02	1.75		1.25	1.22	260.89*
Mean Subordinate Phrases (MSP)		3.8	1.83		1.11	0.91	294 *
Mean Complex Nominals (MCN)		1.89	1.84		3.07	2.01	37.56*
Mean Adverbial Clauses (MAdvC)		0.74	1.02		0.35	0.59	573.61*
Mean Adjective Clauses (MAdjC)		0.37	0.66		0.59	0.69	11.2 *
Mean Noun Clauses (MNC)		0.59	0.8		0.13	0.36	54 *

*p<.01

Tables 8 and 9 show the comparison of adverbial clauses at the Pre- and Post-tests respectively. Experimental group produce more number of adverbial clauses of reason and result than Control group from the Pre- to the Post-test. The differences show statistical significance as indicated by ANOVA test where the calculated value of *F* is more than the critical value of *F* (reason *F*=25, result *F*=10). This is an example of complexity where the use of adverbial clause of reason and result is indicative of an ability to analyze, logically arrange information as well as conclude information. The second hypothesis is supported which says that *Experimental Group will produce more adverbial clause of reason in writing at the Post-test in comparison to Control group*.

Table 8 Performance of experimental and control group written language production pre-test

	N=201	Exp. Grp.	S.D.	N=201	Control Grp.	S.D.	*F*- value
Mean Adverbial Clauses of Time (MAdvCTime)		0.28	0.6		0.12	0.16	10.8 *
Mean Adverbial Clauses of Place (MAdvCPlace)		0.01	0.1		0.06	0.26	5
Mean Adverbial Clauses of Comparison (MAdvCComparison)		0.01	0.1		0.06	0.24	5
Mean Adverbial Clauses of Condition (MAdvCondition)		0.16	0.44		0.03	0.17	16.55*
Mean Adverbial Clauses of Purpose (MAdvCPurpose)		0.01	0.14		0.005	0.07	2
Mean Adverbial Clauses of Concession (MAdvCConcession)		0.01	0.1		0	0	0
Mean Adverbial Clauses of manner (MAdvCManner)		0.10	0.33		0.25	0.53	10.45*
Mean Adverbial Clauses of Result (MAdvCResult)		0.03	0.17		0	0	3
Mean Adverbial Clauses of Reason (MAdvCReason)		0.16	0.41		0.19	0.48	0.6
Mean Adverbial Clauses of Frequency (MAdvCFrequency)		0.005	0.07		0	0	1.0
Mean Adverbial Clauses of Opposition (MAdvCOpposition)		0.01	0.1		0.010	0.1	0
Mean Adverbial Clauses of Contrast (MAdvCContrast)		0.005	0.07		0.005	0.007	0

*p<.01

There is also an increase in the number of adverbial clauses of condition produced by the Experimental group from the Pre-test to the Post-test in comparison to the Control group, but the difference is not significant.

Table 9 Performance of experimental and control group written language production post-test

	N=201	Exp. group	S.D	N=201	Control group	S.D	*F*-value
Mean Adverbial Clauses of Time (MAdvCTime)		0.43	0.68		0.21	0.51	1.54
Mean Adverbial Clauses of Place (MAdvCPlace)		0.11	0.41		0.03	0.17	7.1 *
Mean Adverbial Clauses of Comparison (MAdvComparison)		0.04	0.22		0.02	0.14	0.5
Mean Adverbial Clauses of Condition (MAdvCondition)		0.24	0.65		0.05	0.07	38.2 *
Mean Adverbial Clauses of Purpose (MAdvCPurpose)		0.06	0.24		0	0	12 *
Mean Adverbial Clauses of Concession (MAdvCConcession)		0.01	0.10		0	0	2
Mean Adverbial Clauses of Manner (MAdvCManner)		0.27	0.59		0.05	0.22	25.2 *
Mean Adverbial Clauses of Result (MAdvCResult)		0.13	0.44		0.005	0.07	16.8 *
Mean Adverbial Clauses of Reason (MAdvCReason)		0.46	0.75		0.02	0.14	66.41*
Mean Adverbial Clauses of Frequency (MAdvCFrequency)		0	0		0	0	0
Mean Adverbial Clauses of Opposition (MAdvCOpposition)		0.04	0.21		0	0	10
Mean Adverbial Clauses of Contrast (MAdvCContrast)		0.02	0.12		0	0	3.13

*p<.01

6. DISCUSSION

In this section the results of syntactic complexity in written language is compared to earlier studies. The mean lengths of the written units for Experimental group were 111.65 words per sentence, 79.16 words per T- unit, and 85.40 words per clause at the Post-test. These lengths indicate a complex use of written language. As compared with previous studies numerically the difference is high (16.53 words/sentence, 14.57 words/T- unit and 6.25 words/clause in Pekka Lintunen and Mari Mäkilä 2014). This difference could be the result of a large sample selected for the present study (201 students in the present study and 18 in previous study). This definitely points to the complexity of written language. The varying results can be attributed to the different proficiency levels of learners as well as due to the effect of task design (game-based learning) that had an impact on the language production.

Wang & Slater, (2016) compared writing tasks of English proficient users and second language Chinese speakers in English. The findings revealed that Chinese students' produced an average length of 22.23 sentences, an average length of 19.33 T-units and an average length of 10.34 clauses. This is in contrast with the native speakers where MLS is 26.94, MLT is 22.60 and MLC is 12.34. Wang and Slater found a significant difference in the mean length of sentences and the mean length of clauses produced by the proficient learners of English. The study however, failed to find a significant difference in the mean length of T-units produced. In the present study, a significant difference was found as indicated by the *F* value, in the mean length of sentences, the mean length of T-units and the mean length of clauses produced by Experimental group from the Pre to the Post-tests, who were trained with game-based learning (*F*=29.74, *F*=464.70 and *F*=15.93). This finding is in accordance with previous studies Wolfe-Quintero et.al. (1998). But Lu, (2011) argues that the best length measure to distinguish L2 writing proficiency is MLC, the second being MLS, and the third being MLT. The data from the present study shows that the MLS of Experimental group is the index that most distinguished them from Control group, the second difference is MLC and the third difference is MLT. The results are therefore not consistent with the results of Lu, (2011) and Xu, (2013), who also studied syntactic complexity. That is, in terms of length indices the more proficient users tend to produce longer sentences, longer clauses as well as longer T-units. Wang and Slater also reports of an increase in the number of dependent clauses /T-unit and dependent clauses/clause in non-native Chinese writers. This is in accordance to the present study where Experimental group produce more number of dependent clauses/sentence as well as T-unit.

Jennifer D'Souza, (2016) analyzed the writings of VI grade non-native (Marathi) students in terms of T- units. Her findings are very close to the findings of the present study for Experimental group in writing compositions (an average of 9.5 T- units/ 6.72 T-units Exp. grp. in the present study, an average of 7 single clause T- units/ 3.6 single clause T-units in Exp. grp, an average of 2.5 two clause T- units/ 1.04 two clause T- units in Exp. Grp., an average of 1 three clause T- units/ 2.08 three clause T- units in Exp. Grp. in the present study).

7. CONCLUSION

The aim of the present study was to find out the attainment of syntactic maturity of L2 learners' writing and to find out how task design, that is game-based learning, could have an impact on the results. It was found that engaging the learners in meaningful activities can help them to acquire the skill of writing with ease. Writing is an important skill that requires utmost attention in the teaching field in higher education. The undergraduate students of Engineering are reluctant and are not motivated to write. For these students writing is a skill that does not require to be learnt. As such it was indeed a challenge for the researcher to devise new techniques to incorporate writing in the course of their study as well as give the students an opportunity to have fun and enjoy in the class. The informal environment coupled with the aspect of responsibility and ownership for the completion of the task enabled the researcher to engage the students in writing and also develop their syntactic complexity from the Entry point to the Exit point.

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