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Text-Based Game — A Tool to Enhance Critical Reading and Critical Thinking Skills in English Classrooms

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***Abstract*—Game technology has recently attracted a lot of attention and provides a favourable environment for language learning students who want to improve their English communicative abilities. The purpose of this article is to explore how students utilize gaming technology to increase their critical reading and critical thinking skills while playing. This research is a pre-experimental study with a one-group pre-test and post-test design. Students at the tertiary level are the participants in this study. Choice of the Dragon was a fantasy text-based game used in the experiment. A storyline from the game was transcribed into scripts and distributed to students for the pre-test. The game was introduced with the goal of gaining points on the achievement chart. In the end, the game will display an achievement chart. It encourages the students to continue the gameplay and read intensively until they reach their goal. Google Form was used to collect data for the research. The collected data was analysed with the help of a statistical tool. Students' critical reading and critical thinking skills have increased significantly due to the intervention of the fantasy text-based game.**

***Index Terms*—game technology, critical reading, critical thinking, favorable environment**

I. Introduction

English has risen to become a critical component of almost every profession in today's world. Learning English, in particular, has become a basic necessity in today's global society. When it comes to English language learning, reading competence is one of the most important features to analyse. In addition to linguistic abilities, fluent reading requires the successful use of many reading methods. Reading is a "strategic process" because readers must choose from a variety of skills in order to achieve their varied reading targets. However, the majority of students from rural backgrounds confront several difficulties in learning English. During the learning process, some students are constantly stressed, and according to experts, the current pandemic condition has increased the frequency of depression among students (Serumena et al., 2021). In order to encourage students, new and innovative strategies are required. Technology plays a significant role in education when it comes to innovative techniques. Technology is increasingly becoming a necessary aspect of daily life. This technology transformation has made its way into the classrooms of modern education systems. It encourages instructors to think about and incorporate digital content into their lesson plans.

Games are often regarded as key instructional techniques in the educational field. This technique can be used to deal with the anxiety and desperation that might happen during the language learning process as well. When it comes to learning a language, it is necessary for students to have a positive attitude. Teachers must work very hard to help their students develop a positive mindset that will help them learn. A variety of approaches and procedures should be used in English language teaching to help students acquire the language effectively. Students' fear of the language should be reduced by allowing them to study it on their own time. Even in regular life in current society, individuals are often required to deal with complex customer and work concerns, make choices, and solve issues. In order to achieve this quickly and effectively, it is crucial for students to have the capacity to critically evaluate what they see, hear, and read. In literature, it can be noted that critical reading and critical thinking have all been described in a number of ways.

II. Literature Review

Technology is no longer a strange idea among today's youth or in the world of education. Students have extensive exposure to technology, particularly smartphones, since they were raised in a digital environment from the start of their school lives. Technology provides a source of encouragement as well as a platform for effective learning in the educational environment. According to the research findings, mobile devices provide unique features that enable students to learn easily (Hashim et al., 2018; Crompton, 2019). As a result of technological advancement, the majority of students effectively acquire English through games. With the advent of the internet, there could be a variety of opportunities to make contact with people or with the computer itself. At the same time, many individuals became

acquainted with gaming instruments such as smartphones, tablets, and laptops (Nour et al., 2020). The desire of a person to use a second language outside of the classroom may be determined by their level of confidence in the given language (Smith, 2019). The idea of text reading has developed as the use of technology becomes more widespread in our daily lives. It has become more important to understand and use these technologies to connect and influence the virtual environment. Students who play computer games tend to pay more attention while they are in the classroom. Digital games are concerned with mental and social circumstances in addition to their impact on learning and comprehension processes (Girmen & Kaya, 2019). Students will have a higher level of motivation, which will lead to better involvement in the classroom. Games may support the creation of a good learning environment in which students are encouraged to study the language for a long period. Fluency and self-assurance in reading the language may be fostered through the use of games.

Game-based learning strategies may help English language students enhance their grammar and vocabulary skills as well as their listening, speaking, reading, and writing abilities (Franciosi, 2017; Gamlo, 2019; Nour et al., 2020). According to some scientific evidence, games may be effective in learning when dealing with difficult subject matters (Turgut, 2009). Gaming is becoming more associated with learning, and several models have been developed to identify the various learning outcomes that may be acquired from active participation in digital games. O'Neill et al. (2005) say that subject knowledge and the ability to solve problems are content-specific skills, while teamwork, communication, and the ability to control oneself are content-independent skills.

III. Rationale of the Study

In the technologically advanced environment of the 21st century, students spend much of their time playing online games. There is a link between learning the English language and playing games on the internet, because students can quickly learn a language through games on the internet. The use of online games in the English classroom helped students learn more effectively because the games captured their attention and motivated them. Instead of assigning students a large amount of homework and having them follow the traditional method of education, teachers can use online games to encourage students' creative thinking. Even the most reserved students may take part in language learning through the use of online games. Therefore, the purpose was to study the effect of text-based game on enhancing critical reading and critical thinking skills in the English classroom.

IV. Games as an Innovative Technique

Students' interest in language acquisition may be stimulated if their instructors use strategies that include aspects of fun and entertainment in the learning process. According to several studies, children's interest in a topic is increased when they are actively participating in the learning process. Students can easily explore and learn relevant aspects of language when games are used to teach English to them. There are many reasons why games can be used to boost students' language learning abilities. Firstly, games allow students to practise different language skills. Games promote student-centered learning by limiting the teacher's control in the classroom (Willis, 1996). Games not only assist students in grasping the idea and growth of the English language, but they can also be used to create interest and encourage students to practise the English language (Prensky, 2001; Whitton, 2010). When games are used in education, they may help to reduce boredom while maintaining the repetition that is necessary for better learning outcomes. The advantages of incorporating technology into games may attract students into virtual worlds and make them feel more comfortable with the concepts.

Technology provides a platform that allows students to feel more engaged in their learning experience. Karaaslan et al. (2018) explore numerous ideas regarding what makes environments naturally intriguing, and they come up with three: challenge, fantasy, and curiosity. Games have earned their position in education field as technology has advanced, enabling players to surf in a virtual world with a diverse range of exploring possibilities (Sundqvist & Sylven, 2012). It seems that the most successful strategy for encouraging interactions in the language learning process is through the use of online games. The chat box, which will be accessible in an online game, will allow for interactions to take place while a game is being played. Players on a team will be able to carry on conversations with one another using the chat box. Students have the opportunity to learn through experience and practise, and games can generate interest in the process of language acquisition. Games allow students to participate actively in the learning process and encourage them to initiate discussions with one another in order to accomplish goals in the game. As a learning tool, games motivate students to participate in classroom activities.

"The real benefit of such a tool is not only making students more enthusiastic to take part in such activities, but rather increasing their confidence in every kind of English interaction and also promoting their English ability" (Hamid et al., 2014, p 286-291).

The use of technology is becoming one of the most important parts of making language education more effective (Ghazal et al., 2016). Games can be played online. Online games played on a computer are an example of technology. If students didn't have access to technology, they would lack interest in learning. Educators recognise technology's potential to provide students with both individual and collaborative learning environments in which to study and practise a new language.

V. Research Questions

1. Is a text-based game a motivational tool to create interest and encourage students to actively participate in the English classroom?
2. What is the effect of text-based games in motivating students to develop critical reading and critical thinking skills?

VI. Objectives

The current research aims

1. To assess the efficiency of B Tech students in critical reading and critical thinking skills.
2. To assess reading comprehension level of the learners.
3. To identify the impact of online games to improve language acquisition and language retention

VII. Research Method

This research is a pre-experimental study with a one-group pre-test and post-test design. The participants in this study are students at the tertiary level. Choice of the Dragon is a fantasy text-based game that has been used in the experiment. A storyline from the game was transcribed into scripts and distributed to students for the pre-test. The game has been introduced with the goal of gaining points on the achievement chart. The accomplishment chart will be presented at the end of the game, motivating students to continue playing and reading intently until they attain their target. A post-test will be conducted after the experiment. A post-test would be used to compare with a pre-test to determine the influence of text-based games on critical thinking and reading skills.

A. Participants

The study's participants are tertiary level B. Tech students from VIT. As a result of the participants' technical backgrounds, they rely on critical reading and critical thinking skills. Through random sampling, 66 students were selected from the first year. The pre-questionnaire consisting of 15 items was circulated to 66 students in order to determine their interest in learning a language through online games. The researcher explained the study's objectives and methodology, starting with the pre-questionnaire, pre-test, treatment, post-test, and post-questionnaire.

B. Materials and Instruments

Google forms are used to collect the data for the pre-and post-questionnaire and pre-test and post-test. Choice of the Dragon is the fantasy text-based game from textadventure.co.uk used for the experiment. Choice of the Dragon is a text-based multiple-choice game in which the students have to choose between the choices. Players' choices influence the action, the dragon's appearance (including gender and colour), and several other aspects. Each screen has a brief scenario as well as a variety of other alternatives to choose from. For each action the player's dragon will do next, the player must read the storyline and make a selection from a menu of available possibilities. Choice of the Dragon keeps track of traits such as cruelty, finesse, scorn, and honor, as well as health, money, and infamy, all of which are influenced by the decisions the player makes on each screen. Choice of the Dragon is a role-playing game. A summary of the accomplishments will be provided at the end of the game. SPSS is the statistical software used to analyse the findings.

C. Research Design

This experiment included qualitative and quantitative research. The current research uses a pre-experimental study design with a pre-test and post-test. The pre-questionnaire was circulated through Google Forms to the chosen B-Tech class, consisting of 66 students. Following the completion of the pre-questionnaire, pre-test questions were developed and distributed to determine the level of comprehension, critical reading, and critical thinking abilities of the participants. The fantasy text-based game "Choice of the Dragon" was chosen from the website textadventure.co.uk. The treatment then began with instructions on how to play the game and the conditions that must be accomplished in order to complete it. After completing the game, the achievement bar was collected from the students to know how many attempts they had made to complete the game. Students were asked to write a descriptive paragraph about the game as well as their experience with the game.

Rubrics were developed to assess the critical thinking and critical reading abilities of the students after treatment. The post-test has been conducted to analyse the level of the students; it consists of 10 questions that were used in the pre-test. Students were allowed to play as many times as they wanted until they reached the required level. SPSS software was used to examine the data. Data from the pre-and post-questionnaires were examined using descriptive statistics and frequency analysis in SPSS. A paired t-test was done to compare the values obtained after the post-test and pre-test, and the mean was assessed using the paired t-test as well.

VIII. Findings and Discussion

Students performed better after the treatment when compared to test results before and after the treatment. This was evident in statistical pre-and post-test comparisons. In this study, participants were asked to complete pre-questionnaire

consists of 15 items which was prepared using a Likert scale, on which their views on reading stories and comprehension skills were gathered and analysed. The majority of the students were not interested in reading the stories that were presented in Table 1, after which a pre-test was conducted. The findings of the Pre- and Post-tests were presented as means standard deviations, and they were statistically analysed using the SPSS statistical software.

TABLE 1
PRE-QUESTIONNAIRE (15 ITEMS), N=66

Pre-experimental Method	Mean	Std. error mean	Std. Deviation	Frequency				
				1	2	3	4	5
Pre-Questionnaires								
I would like to read fantasy stories in my free time.	3.1667	.13412	1.08958	4	15	20	20	7
When I read a text, I read the text over and over again.	2.8788	.13743	1.11652	5	24	17	14	6
When I read a text, I constantly check with myself whether I understand what I've read.	4.0758	.10425	.84691	-	5	6	34	21
When I read a text, I attempt to find out the concepts that I don't understand completely.	2.8788	.14406	1.17034	6	24	15	14	7
When I don't understand anything in a text that I read, I look for extra information to help me understand.	3.0455	.13558	1.10149	4	19	20	16	7
I'm able to recall information from a text that I've read.	3.3939	.13463	1.09374	2	15	14	25	10
I can recognise particular phrases in a text.	3.1212	.14406	1.17034	6	16	15	22	7
I can identify and understand the key points in a text.	2.9091	.15529	1.26159	9	21	10	19	7
I can recognise supporting information in a text.	3.1061	.15287	1.24194	6	17	19	12	12
I can read lengthy and hard texts quickly and locate relevant details.	3.2424	.14332	1.16435	4	15	19	17	11
I can summarise the key points in a text.	3.4697	.12631	1.02612	1	13	16	26	10
I can describe supporting details in a text.	3.2879	.14765	1.19955	5	15	12	24	10
I can explain the meaning of words or sentences from context.	2.8485	.14683	1.19283	8	21	17	13	7
I can extract particular information from a text.	3.3333	.14855	1.20682	5	13	15	21	12
I can understand the relationships 1) within sentences, and 2) between sentences.	3.0303	.15109	1.22750	6	21	13	17	9

The pre-test findings show that students are low in critical thinking, reading, and comprehension skills, which indicates that their skill levels must be improved. After the pre-test, treatment was done by introducing the game "Choice of the Dragon". Rubrics were used to prepare the data for the collected screenshots. Each correct answer has 1 mark. The highest mark is 10, and the lowest is 0.

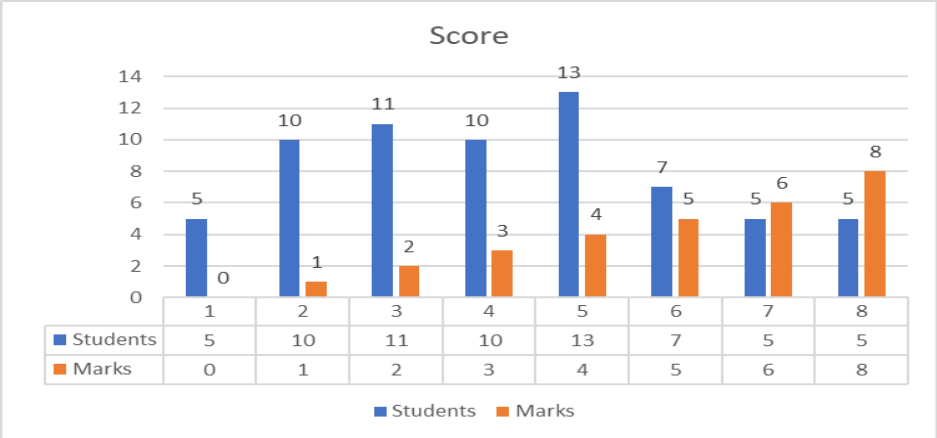


Figure 1 Pre-test Score

During the treatment, students were asked to take screenshots of every attempt and they were asked to read the story in the game intensively to attain above 90% of the honor level. After completing the game, screenshots were collected. Before conducting the treatment, the students were instructed about all of the critical reading and critical thinking strategies and how they could be used. The mean value of the marks was shown by the bar graph. The average score of the students is 7.80. After the treatment, the students begin to show interest in playing text-based games and reading comprehension activities.

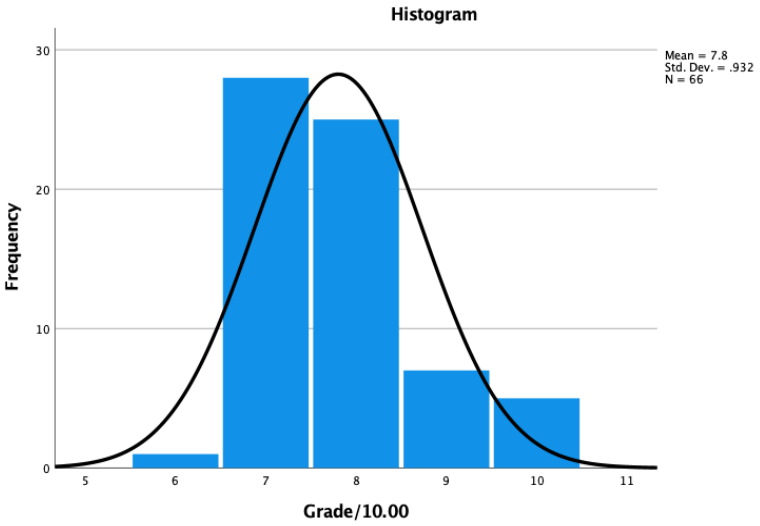


Figure 2 Histogram Date of the Experiment

A post-test was given to the students after the treatment. The students' post-questionnaire data was collected using the Likert scale. Both pre-and post-questionnaire data were analyzed. Students seem to show an interest in playing text-based games, and they also show that the students had positive opinions about reading fantasy stories. A post-test was done after collecting data from the post-questionnaire. Then, the overall outcome of the experiment was evaluated using paired t-tests.

TABLE 2
POST-QUESTIONNAIRE (15 ITEMS), N=66

Pre-experimental Method	Mean	Std. error mean	Std. Deviation	Frequency				
				1	2	3	4	5
Post-Questionnaires								
1. Stories are more interesting to read when they are in a game.	4.2576	.07262	.58993	-	-	5	39	22
2. I can identify the main concepts of the story in the game.	3.4697	.11056	.89820	1	8	23	27	7
3. I can remember the information from a game that I have played.	2.9091	.11969	.97234	2	26	16	20	2
4. I can summarise the key themes of the story that I have learned from the game.	2.5606	.13157	1.06884	10	25	18	10	3
5. I can explain the meaning of words or sentences in the story from the game.	2.5303	.13348	1.08443	12	23	17	12	2
6. When I play the game, I am able to quickly read through lengthy and challenging texts, identifying and highlighting key information.	2.8939	.13678	1.11118	5	23	18	14	6
7. When I play the game, I try to figure out which concepts I still haven't really understood.	3.9394	.11400	.92618	1	4	12	30	19
8. I can discuss the content of a story effectively from the game.	3.6061	.11802	.95883	-	11	15	29	11
9. I can draw conclusions after reading a story from the game.	3.6818	.13162	1.06928	3	7	12	30	14
10. I read the text over and over again to pick the correct answer in the text-based game.	3.7727	.11586	.94128	-	9	11	32	14
11. I can use the lessons I learn from a text-based game to improve my own life.	4.0606	.10099	.82048	-	2	14	28	22
12. I can use the information from a text-based game to decide what is wrong and what is right in life.	3.7424	.12273	.99708	2	4	19	25	16
13. I can understand the relationships: 1. within sentences 2. between sentences	3.7879	.11118	.90324	1	4	17	30	14
14. I can connect the ideas: 1. within a paragraph 2. between paragraphs.	3.9848	.11113	.90286	-	3	18	22	23
15. I can identify and explain writers': 1. views in a text. 2. attitudes in a text	4.1970	.09216	.74874	-	1	10	30	25

The findings of the pre-test and post-test provide a standard for comparing and analysing the outcomes. The figure 3 indicates that students' performance has improved. After examining the data, it can be observed that the mean scores indicate each students' performance. Their performance on the post-test was better than on the pre-test. The mean of the student's performance on the post-test was greater than on the pre-test.

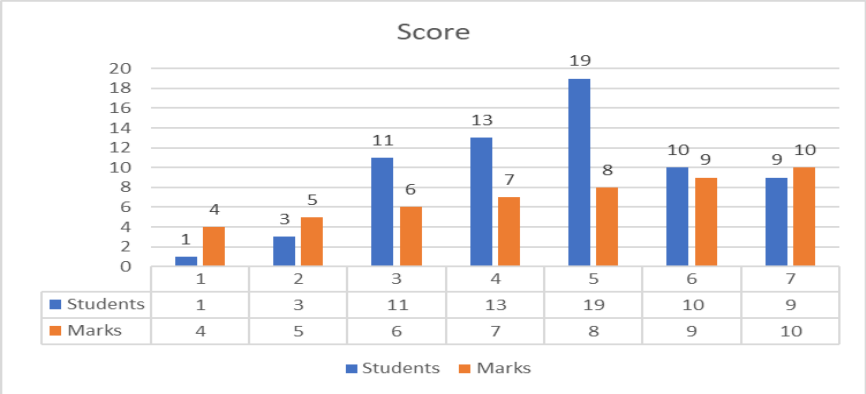


Figure 3 Post-test Score

IX. Analysis of Pre-Test and Post-Test

The results from the pre-and post-test were examined using paired t-tests. The students' pre-and post-test assessments revealed improvements in reading comprehension, critical thinking, and critical reading skills. The pre-test mean was 2.94 and the post-test mean value was 7.70. When compared to the pre-test, the mean score in the post-test has significantly improved.

Table 3
Paired Sample Statistics

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test	2.94	66	1.880	.231
	Post test	7.70	66	1.467	.181

The p-value for the sample is 0.001, which is less than 0.05. It is concluded that there is a statistically significant difference in the scores between the pre-test and the post-test in the paired sample test. It shows that there is an improvement in students' comprehension, critical thinking, and critical reading skills.

Table 4
Paired Samples Test

Paired Samples Test

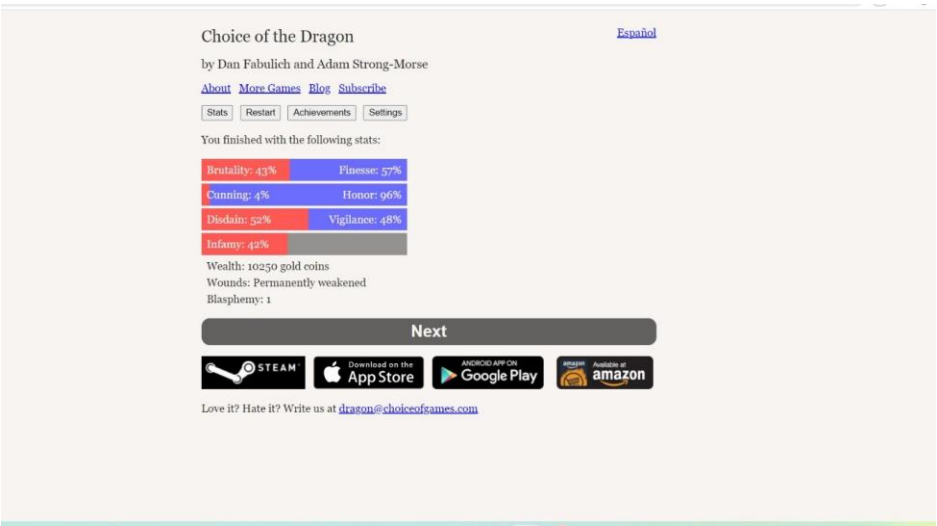
		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			One-Sided p	Two-Sided p
Pair 1	Pre-test - Post test	-4.758	2.380	.293	-5.343	-4.173	-16.241	65	<.001	<.001

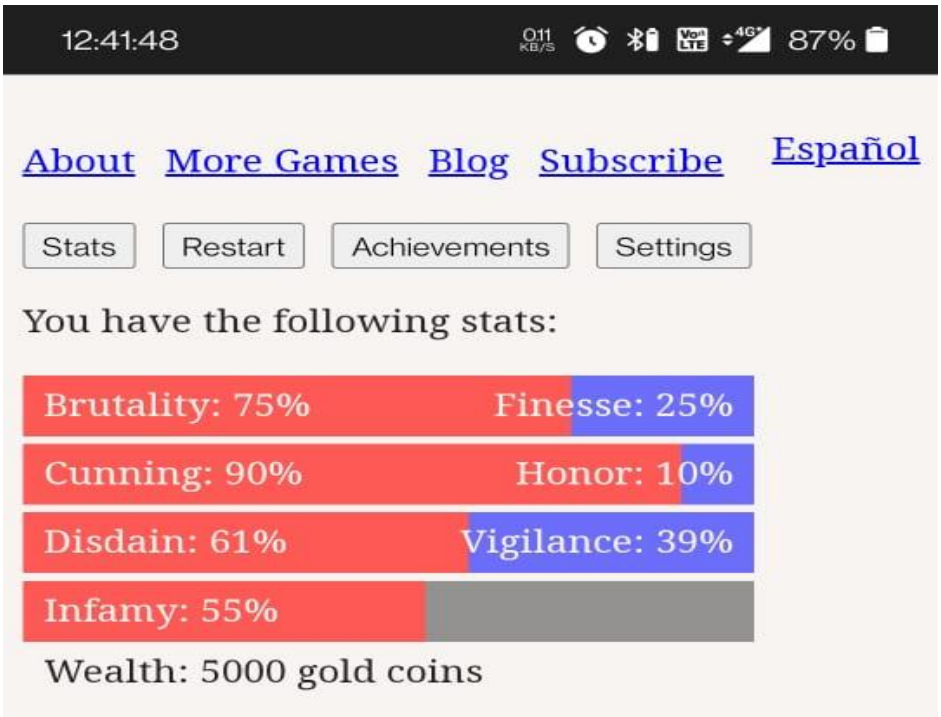
X. Conclusions and Suggestions

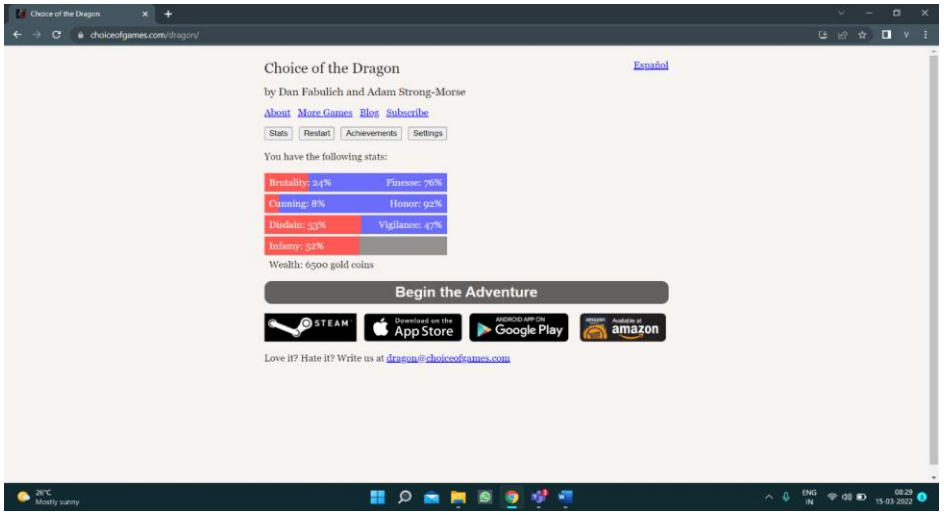
The results of the data analysis suggested that the use of text-based games for the development of critical thinking, critical reading, and comprehension skills is possible in English language classroom. Another factor contributing to the students' progress was the reading comprehension and choice making through games, which were enjoyable and entertaining for the students, allowing them to learn more quickly. The current research, on the other hand, reviled that critical thinking, critical reading and comprehension skills have improvement after the treatment. The statistics in Table 3 suggest that the students' reading and comprehension abilities showed the greatest improvement, with a mean difference between the pre-test and the post-test of 4.758 points between the two tests. Students in this experiment were able to practise reading comprehension, problem solving, and decision-making skills through the internet at any time and from any location because smartphones were in every student's possession, allowing them to practise the skills at any time and from any location by visiting the Text Adventure official website, which is completely free.

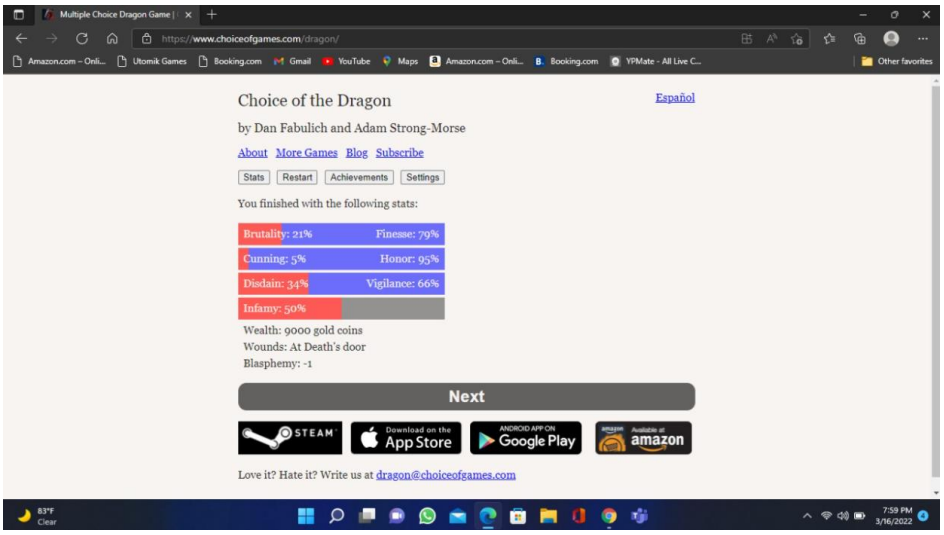
The results of this research further suggest that students who were taught using the games were far more effective in learning new English words. It is clear that games provide a favourable and comfortable environment for less confident students who would usually refuse to engage in English class. According to the findings, games act as a motivational tool to create interest and encourage students to actively participate in language activities. The study concluded that text-based games have a positive effect on enhancing students' critical reading and critical thinking abilities in the English classroom.

APPENDIX. SCREENSHOTS OF THE ACHIEVEMENT BAR COLLECTED FROM THE PARTICIPANTS









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