The Impact of a Designed Digital Learning Programme on Developing Students' English Language Electronic Reading Skills at the College of Tourism and Hospitality

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تأثير برنامج تعلم رقمي مصمم علي تطوير مهارات القراءة الالكترونية باللغة الانجليزية لدي طلاب كلية السياحة والفنادق

مستخلص البحث

هدفت الدراسة إلى التحقق من تأثير برنامج التعلم الرقمي الذي تم تصميمه لتحسين مهارات القراءة الإلكترونية للطلاب باللغة الإنجليزية. وأجريت الدراسة علي مجموعة من (n=40) طالبًا من أصل (n=70) طالبًا في برنامج السنة التحضيرية في كلية السياحة والفنادق. حيث تم إختيارطلاب المجموعة التجريبية التي استخدمت برنامج التعلم الرقمي بشكل عشوائي. وتم تقييم مهارات القراءة الإلكترونية للطلاب باللغة الإنجليزية قبل وبعد البرنامج باستخدام اختبار موحد. وأظهرت النتائج أن الطلاب في المجموعة التجريبية حققوا تحسنًا كبيراً في مهارات القراءة الإلكترونية باللغة الإنجليزية بعد تطبيق البرنامج المصمم لذلك. وتشير نتائج هذه الدراسة إلى أن برامج التعلم الرقمي المصممة يمكن أن تكون فعالة في تحسين مهارات القراءة الإلكترونية للطلاب باللغة الإنجليزية. وتعتبر هذه النتائج مهمة لكل من المعلمين والباحثين والطلاب في مجال اللغة الانجليزية.

الكلمات المفتاحية

التعلم الرقمي، مهارات القراءة الإلكترونية باللغة الإنجليزية، كلية السياحة والفنادق، برنامج التعلم الرقمي.

Abstract

The study aimed to investigate the impact of a designed digital learning program on improving students' English language electronic reading skills. The study was conducted with a group of (n=40) students out of an initial (n=70) in the Preparatory Year Programme at the College of Tourism and Hospitality. The students were randomly assigned to the experimental group, which used the designed digital learning program. The students' English language electronic reading skills were assessed before and after the program using a standardized test. The results showed that the students in the experimental group achieved significantly greater improvement in their English language electronic reading skills as a result of implementing the designed programme. The findings of this study suggest that designed digital learning programs can be effective in improving students' English language electronic reading skills. The results are important for students, researchers and teachers in the field of English.

Key words

Designed Digital Learning Programme, English language electronic reading skills, College of Tourism and Hospitality.

1. Introduction

Digital learning is the use of digital technologies to enhance teaching and learning. It can involve the use of a variety of tools and resources, such as computers, tablets, smartphones, interactive whiteboards, and online learning platforms. Digital learning can be used to support all four language skills (reading, writing, speaking, and listening) in the English language classroom. For example, teachers can use digital tools to create interactive presentations, provide students with feedback on their work, and give them access to authentic English language materials.

Here are some specific examples of how digital learning can be used to teach English reading. Teachers can use digital tools to create interactive reading exercises, such as quizzes, fill-in-the-blank exercises, and matching exercises. They can also use digital tools to provide students with access to a wide range of reading materials, such as e-books, news articles, and blog posts.

Overall, digital learning offers a variety of benefits for teaching and learning English. It can help make learning more engaging and motivating for students, and it can provide them with access to a wider range of learning resources (Pinto & Leite, 2020). Moreover, digital learning can also help to:

- Personalize learning: Digital learning tools can be used to tailor instruction to the individual needs of each student. For example, teachers can use digital learning software to track student progress and identify areas where students need extra support.
- Promote collaboration: Digital learning tools can be used to create opportunities for students to collaborate with each other on projects and assignments. For example, students can use online reading tools to share their work with each other, or they can use video conferencing tools to work on presentations together.

- Prepare students for the future: In today's world, it is essential for students to be able to use digital technologies effectively. By using digital learning in the classroom, teachers can help students to develop the skills they need to achieve success in the future (McKnight et al., 2016).
- Overall, digital learning is a powerful tool that can be used to enhance teaching and learning English in a variety of useful ways.

2. Context of the Problem

Despite the availability of information resources and electronic communications in our time, most students at tourism and hospitality colleges use the related applications for non-educational purposes. The current study aimed to train those students to implement digital learning applications to develop their reading skill and reading sub-skills. Digital learning applications and e-literacy have developed significantly in previous years in most countries of the world. Abou Shaaban, (2020) explained that digital learning tools are elements of a new type of computer-based learning that allows curriculum planners to reuse them several times in different educational situations.

Octaberlina & Muslimin, (2020), stated that learning through text-based, audio, image, video, and interactive simulations helps the learner in the educational process to a great extent. In the same way, Nortvig et al., (2018) on digital learning stated: "I have recently seen a number of discussions in support of and opposed to the introduction and application of digital learning in our classrooms. In theory, digital learning seems to be very useful for all schools and students, with many advantages to digital learning" such as integration, time, place, individuality, participation, database, ownership, as well as parental participation, transparency, and communication with the classroom.

Serdyukov, (2022) added a similar view on digital learning and mentioned: "There is no doubt that digital learning today is more

enjoyable for students than the traditional way, and far from being dazzled by electronics and the Internet, this leads to the learning environment to be the preferred environment for students. On the other hand, the teaching methods used today, which use multiple media, make students more integrated and this leads to greater commitment."

In the same perspective, Sattarov & Khaitova, (2020) stated that learning by mobile phone is learning electronically through computer-operated devices, and in general, with mobile technology, one means all mobile phones that include a digital personal assistant either from digital cell phones or iPods.

The trend of using digital learning and its applications has become the focus of attention not only for educators specialized in learning, but also for those engaged in marketing. An example of this was mentioned by Gray et al., (2020) on the importance of digital learning for teachers and students where he wrote that 52% of university preparatory year students took their tests through digital learning applications to measure E-reading skills, and added that 77% of parents considered the effective impact of digital learning application technology vital to their children's future in terms of acquiring the skills needed to read and write electronically.

Gray et al., (2020) also said there were some reasons that make digital learning important, and these include personalization, application connectivity and efficiency.

Moreover, digital learning achieves what educators currently consider: the student must be the focus of the educational process, as he/she is the one who interprets, discusses, analyses, and expresses his/her opinion, so researchers do their best to create ways of self-learning that combine the use of educational models, multimedia use, network learning, e-learning, etc. (Hassan & Ahmed, 2018).

Reading with its skills, topics and activities is considered a great source of learning and education, and by applying modern technology in the teaching and learning processes, many fields and topics related to

language learning have appeared on the one hand, and the use of educational technology on the other. Among these terms that have been associated with the integration of English language skills and uses of technology, appeared the term: electronic-reading which Armstrong, 2019; Mumrikoh et al., (2023) stated that it contains information available to the learner and that is presented in a systematic manner that suits his mental level and interests, and can be invested in different educational situations.

Amongst the tools of digital learning emerge the role of many applications such as e-reading and the extent to which they affect the level of students' achievement. E-reading is mainly based on the device being used, since there are specialized and non-specialized reading devices. The difference between the two types lies in the type of screen used, with multiple formats of the files used for reading, so that some of them can be adjusted in terms of font size or adding some comments easily.

Electronic reading is unique in its sources as they are interactive, with links to information included in the reading text or audio files that can be listened to and can be copied and adapted that makes it much easier, especially in conducting various researches (Marin-Lacarta & Vargas-Urpi, 2019). Mumrikoh et al., (2023) also, stated that electronic reading is a more selective reading of a text than a total reading of it, and as in printed texts, it aims to find information that is directly mentioned in the framework of the user's research interests, without the need to follow the one-way path of the text from the beginning to the end.

Aktories & Yáñez, (2017) explained that electronic-reading, like ordinary reading consists of three stages: comprehension, understanding and interpretation, and that comprehension in electronic-reading is more important because the reader will find it exceedingly difficult to understand and interpret if he encounters difficulties in comprehension of the text.

3. Statement of the Problem

The problem of the research is the inadequate use of digital learning applications for preparatory year students at the College of Tourism and Hospitality in Riyadh, despite their importance in improving students' electronic reading in English. The researcher first noticed the problem when he was working at King Saud University, (First Preparatory Year Programme, changed later to Common first Year). Although every student owned at least one cell phone, students did not use their mobile phones to improve their English language skills.

The problem continued with the same programme at Prince Abdulrahman Al-Faisal University in Dammam, eastern of Saudi Arabia. Students were more interested in using their mobile phones to chat or play games instead of improving their electronic reading skills in English. The research problem was slightly dealt with by applying the WhatsApp in texting of some assignments to students.

The dilemma of Covid-19 made the research problem crystal clear in that there is an urgent need to benefit from the digital learning applications in contacting students at their places of residence. Implementing the digital learning applications in teaching reading is considered to be of great value to the majority of students (Khalil et al., 2020).

The research problem became extremely important to the researcher to conduct his research. That point became a dominant feature while working at the College of Tourism and Hospitality in Riyadh.

4. Questions of the study

To solve this problem, the researcher designed a digital learning-based programme to develop students' English language E-reading skills to answer the following main question:

1- What is the effect of using a learning programme based on the digital learning applications to develop the English language E-reading skills for students at the College of Tourism and Hospitality?

The following sub-questions are derived from the main question:

2. What are the English language electronic-reading skills needed for students at the College of Tourism and Hospitality?

3. What are the digital learning applications suitable to design a learning programme to develop E-reading English language skills for students at the College of Tourism and Hospitality?

4. What is the impact of a digital learning-based program on developing English language E-reading skills for students of Tourism and Hospitality Colleges?

5. Hypotheses of the Study

The following hypotheses were formulated to be tested:

1- There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the mean scores of the pilot group students between the reading skills pre-test and the post-test.

2- There are no significant differences regarding the suggested electronic reading skills between the reading pre-test and the post-test.

3- There are no significant differences in implementing the recommended digital learning applications between the pre-test and the post-test.

4- There is no impact of the designed digital learning programme on developing English language E-reading skills for students of Tourism and Hospitality Colleges.

6. Objectives of the Study

1. Develop the English-language electronic-reading skills needed for students at the College of Tourism and Hospitality using digital learning applications.

2. Design a proposed vision for a program based on digital learning applications and measure the impact on the development of English language electronic-reading skills for students at the Faculty of Tourism and Hospitality.

3. Reveal the impact of using digital learning applications in the development of English language e-reading skills for students of the Faculty of Tourism and Hospitality.

7. Significance of the Study

The study results are expected to be useful in:
1. Drawing the attention of the teachers of English in the colleges of tourism and hospitality to the need of paying more attention to the development of English language E-reading skills for students.

2. Providing English language teachers in tourism and hospitality colleges with information on digital learning applications to help them develop students' electronic-reading skills.

3. Providing the authors of English language courses in the colleges of tourism and hospitality and other colleges with a model of a program based on applications of digital learning that can be used to develop the English language E-reading of students, which can be used to develop English language teaching in those colleges.

4. The study may benefit those who are responsible for the teacher's professional and academic development programs.

5. The study may benefit the English language supervisors and coordinators who supervise the colleges of tourism and hospitality.

6. Paving the way for researchers on how to use digital learning applications to develop electronic-reading skills for students at different levels of education.

8. Delimitations of the Study

This research is delimited to the following points:
A) A sample of students of the Faculty of Tourism and Hospitality - preparatory year in Riyadh, Saudi Arabia.

B) Time Limits: second semester of the 2022/2023 academic year.
C) Objective Limits: a program based on digital learning applications to develop English language Electronic-reading skills for students at the Faculty of Tourism and Hospitality.

9. Study Terms

9.1 Digital Learning

Abdel-Majeed, (2021) states that digital electronic-learning is an educational system that results from the integration and interaction of three key components: education, technology, and content, and therefore it is teaching, content or educational activity through digital electronic technologies.

The researcher defines digital learning procedurally as an education based on the use of multiple technological means to meet students' different educational needs to suit the modern era.

9.2 Training Programme

Defined as "Key activities involving objectives and content, carried out by several development training methods over a certain period of time" (Mehrpour & Moghaddam, 2018).

The training program in this research is defined as "an organized and planned educational plan, aimed at raising the level of students in using digital learning to show to what extent it influences the development of electronic-reading skills.

9.3 Electronic (digital) Reading

Hassan Taj et al., (2017) state that electronic-reading is the process of reading through electronic sources of all kinds, whether through electronic-books, web pages, optical discs, electronic courses, and other computer learning media, through which the reader can browse as many electronic materials as possible easily, quickly, and comfortably.

The researcher defined electronic reading procedurally as: the set of pre-planned practices, which the learner receives and performs in its electronic image through reading in multiple electronic sources, which are prepared, designed, and presented through the computer to develop the skills of reading electronically and tend to move towards digital learning.

10. Literature Review

The researcher reviewed the literature and read some of the previous studies over the last five years that have shed light on applications related to the digital learning and their impact on learning English, and the development of E-reading skills. By looking at these studies, the researcher has come to match the results of most of these studies with the research hypotheses imposed by the researcher in his research plan.

The studies of Armstrong, (2019); Hallisey, (2017); S. R. Hoye, (2017) agreed that teachers who had additional training in technology were more comfortable using technology associated with digital learning applications in the classroom than teachers who had less time, and studies showed that this field is still in need of more professional development to gain a deeper understanding of the transitional role played by digital tools in the classroom in the development of E-reading skills. They also added that the participating teachers have shown a clear understanding of what needs to be known, learnt and applied in order to provide opportunities for digital learning during the use of applications to help in the classroom, while the Hawthorn study, (2018) indicated that the lack of appropriate professional development was evident among teachers.

Prybil, (2018); Sanders & Blakeley, (2021) studies also indicated that there was no significant difference in the reading progress of students using a digital learning source compared to their traditional study method, and studies showed that through the use of *ANCOVA Analysis*, the researcher found that there was no significant impact on the grades of students in the experimental group in the final test. The Imel, (2018); Serry et al., (2018) studies, agreed that students who practiced vocabulary in reading with the support of technological means, had an impressively higher grades than the results of the group studied in the traditional way. These studies recommend the use of technology in teaching English because it is an influential method, and added that there are positive advantages to online reading including strengthening vocabulary, supporting cognitive background, supporting fluency in speech, and inferring the main ideas.

While there is a difference between the results of the studies of (Crum, 2017; Imel, 2018) in that reading using digital tools showed a decrease in the level of understanding when reading from a digital screen compared to reading from a paper source under certain conditions, which was also included in the Cunningham, (2019) study, which indicated that both college and middle school students use the internet mainly, but everyone preferred using the printed documents.

Studies by Koelzer, (2017), Hellmich, (2017), Chang et al., (2018), NGONGO, (2017) and Smith & Lewis, (2017), have pointed to the importance of using digital and technological learning in learning foreign languages, particularly English, which comes as a second language from the original language. Consequently, this is why it is argued that digital training can be integrated into the foreign language reading and writing curriculum to strengthen students' knowledge of training in the digital age and allow learners to become skilled readers and writers. Therefore, the use of technology is recommended to be included in students' personal lives to facilitate academic reading experiences in the second language classrooms.

Furthermore, studies by Morris, (2016), Hawthorn, (2018), and Akobirov, (2017), have shown that teachers who lack the resources to develop teaching methods of reading using digital learning and digital technology, often feel unprepared or unqualified to do so in their classes. Moreover, the studies have also shown the benefits of digital learning in supporting the development of the primary level and overcoming difficulties and personal learning. Most studies favoured the use of the semi-experimental method, such as Garcia de Blakeley et al., (2017), Buchanan et al., (2021), and Crum, (2017). The studies of Chang et al., (2018, M. J. Smith, (2018), Van Oostveen et al., (2016) and Kay & Luckin, (2018) have addressed the university education stage and applied the study to a sample of university students in many nationalities, while pre-university education was a study of (Hallisey, (2017); R. S. Hoye, (2017); Nikam, (2018); Williams, (2021). These studies all agreed on the importance of the role played by technology in general and digital applications in particular in the field of education and language learning for teachers, students and the society in general.

11. The Methodological Procedures of the Field Study

To answer the search questions, the researcher read:
1. Studies related to English language electronic-reading skills.
2. Studies related to smart applications of digital learning.

The researcher conducted a pre-test for preparatory year students at the Faculty of Tourism and Hospitality in the English electronic-reading skills before applying the research experiment to find out later if there are differences between the pre-test and the post-test results.

12. Instruments and Materials

The present study used the following instruments:

1. E-reading Skills Checklist
2. Pre-post- E-reading Test.
3. The designed digital learning-based programme.

13. Participants of the Study

Participants of the study were Common First Year students (Preparatory year) who volunteered to take part in the study in addition to English language teachers in the Common First Year Programme who were given a questionnaire to find out their perspectives on using digital learning applications. The sample students were level B (intermediate) students who study Q Skills Reading and Writing, Books 3 and 4. The students take the Q Skills general English as preparation for joining the College of Tourism and Hospitality. The total number of the sample that took the pre-tests was (n=69). Of that number, forty students completed the treatment until they were finished with the post-tests.

14. Sample Size Calculations Protocols

a. Two independent samples

The current study was conducted to assess the difference between pre and post-test concerning reading paired samples t-test is proposed or corresponding statistical analysis for nonparametric data is proposed (Figure 2). A minimum total sample size of (n=36) participants will be sufficient to detect the effect size of 0.50, a power (1-β) of 90 % (=0.90) at a significant level of $p<0.05$. Proposing a non-response rate of 10%, accordingly, a total sample size of 40 (36+3.6= 39.6) was applied during the current study. The sample size was calculated according to G*Power software version 3.1.9.6. (Faul et al., 2013).

Where, d= is the effect size=0.50; α= 0.05; β=0.2; Power=1- β= 0.90

$$d = \frac{\mu_1 - \mu_0}{\sigma}$$

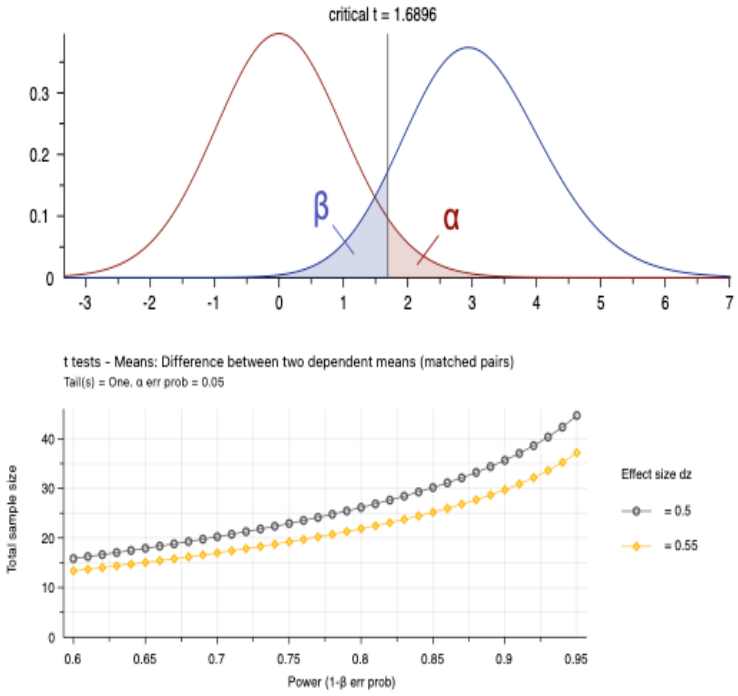

Figure 1 Graphical presentation of α, β, power (1-β) and total sample size.

Table 1 Variables of Study

Variable	Symbol	Denote	Number of samples
	A0	**A0:** Pre-test	40
	A1	**A1:** Post-test	40
Total			40

b. Statistical Analyses

The statistical analyses were carried out to evaluate and compare between pre and post-test; Paired samples t-test or corresponding statistical analysis for nonparametric data is proposed.

Data was collected, checked, revised, and organized within tables and figures using Microsoft Excel 2016. The collected data will be subjected to outliers' detections and outliers were handled using IBM-SPSS. Normality was applied to check the data normality whether parametric and nonparametric data using Shapiro-Wilk test.

Data will be described statistically using both graphical and numerical description. Descriptive statistic of parametric data (grades, and grades %) was performed in terms of minimum, maximum, mean, standard deviation. Inferential statistics for comparing between pre and post-test was performed by Paired samples t-test. However, nonparametric data was described in terms of frequency (n, %) in addition to mean and standard deviation. Inferential statistics for comparing scores were performed using Chi-squared test and between pre and post using Wilcoxon signed rank at significance probability levels of 0.05. Data analyses will be carried out using computer software Statistical Package for Social Science (SPSS) IBM-SPSS ver. 29.0 for Mac OS (Knapp, 2017).

15. Results and Discussion

The results of the study showed the positive impact of the designed digital learning programme on developing students' English language e-reading skills. Although the hypotheses of the study did not assume statistical differences, the results have shown obvious differences between the pre-test and post-test reading results.

The descriptive statistics in terms of minimum, maximum, means, standard deviations (SD) of reading grades and grades % of total reading grades are shown in Table (1), Figures (1-3). The grades in pre-test ranged between 2 to 9 with an average (±SD) of 6.8±1.9, however, post-test ranged between 5 to 13 with an average (±SD) of 8.1±2.8. The difference between Pre-test and post-test was highly significant as revealed by paired t-test (p=0.003**).

The grades in pre-test ranged between 13.3 to 60 % with an average (±SD) of 45.5±12.8 %, however, post-test ranged between 33.3% to 86.7% with an average (±SD) of 54.2±15.8 %. The difference between Pre-test and post-test was highly significant as revealed by paired t-test (p=0.003**).

Table 2 Descriptive statistics in terms of Mean, SD of Reading grades and grades % of total reading grades.

Time	Reading							
	Grades				Grades %			
	Min	Max	Mean	SD	Min	Max	Mean	SD
Pre	2	9	6.8	1.9	13.3	60.0	45.5	12.8
Post	5	13	8.1	2.4	33.3	86.7	54.2	15.8
T-test	-3.134				-3.134			
sign.	0.003**				0.003**			

*, **, ***, Significant at p<0.05, <0.01, <0.001; ns, non-significant at p>0.05

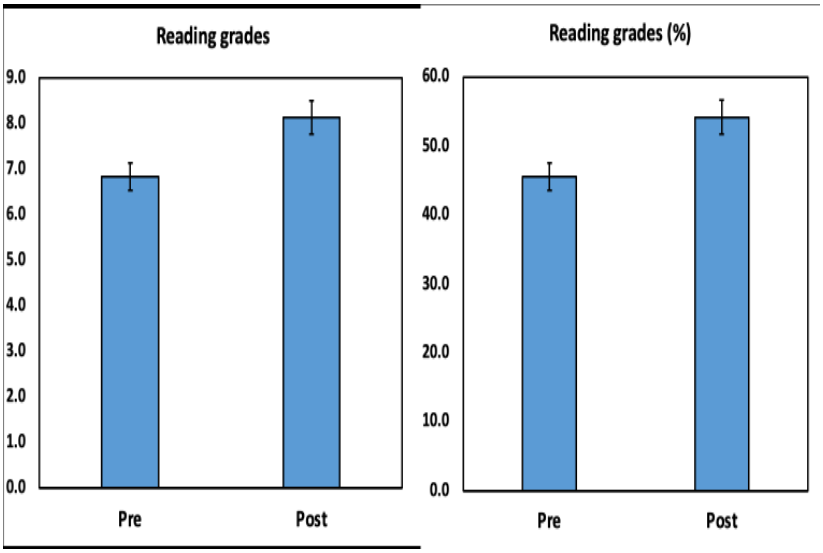

Figure 2 Bar chart presenting grades of Reading both pre- and post-.

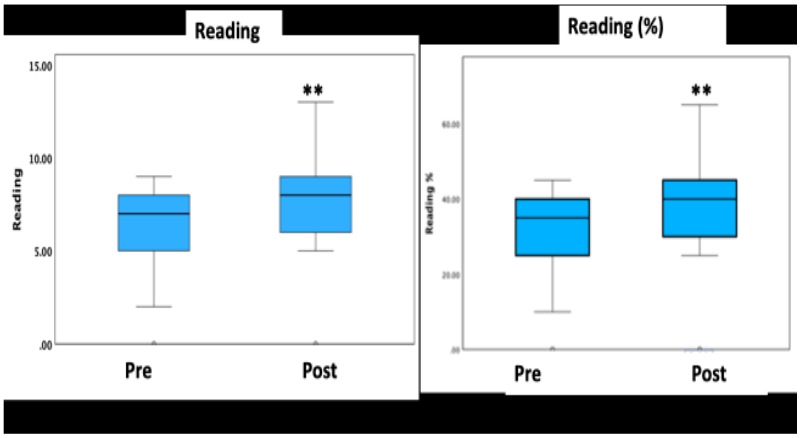

Figure 3Boxplot presenting grades of Reading (%) both pre- and post-.

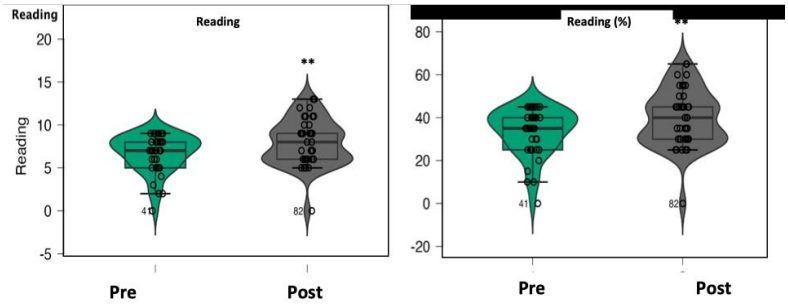

Figure 4 Violin Boxplot presenting grades of Reading (%) both pre- and post-.

a. Reading Pre-Post Tests

The Reading Pre-Post Tests were submitted to a jury to provide feedback on the validity of the various reading skills that needed to be assessed. The related reading skills are indicated in Table (3).

Table *3* Electronic Reading Checklist - (The Initial List)

Descriptive statistics of student's Reading Pre-Post Tests showing mean median, mode, SD, percentile, and Chi-square were presented in Table (3).

Electronic Reading Skills	1-Strongly agree	2-Agree	3-Undecided	4-Strongly disagree	5- Disagree
A-Pre-reading Skill					
1-Reading for gist.					
2-Guessing the meaning of unfamiliar words through words morphological knowledge. (prefixes & suffixes)					
3-Inferring the meaning of unknown words/phrases through context clues.					
4-Identifying main ideas					
5-Organizing ideas					
B-While Reading Skill					
6-Reading for details.					
7-Taking notes					
8-Using electronic dictionaries					
9-Identifying pronoun reference correctly.					
10-Identifying key words.					
C-Post-reading Skill					
11-Identifying the author's purpose					
12-Drawing a conclusion about the text.					
13-Summarizing the text.					
Comments					

In Reading Pre-test, the average (±SD) students' scores recorded for reading questions 1, to 15 were 2.2±1.08, 2.3±1.39, 1.2±0.68, 1.4±0.80, 3.5±0.91, 2.2±0.61, 1.9±1.24, 2.0±0.45, 2.8±0.76, 2.0±1.05, 3.0±0.75, 2.8±0.84, 2.7±0.92, 2.3±1.07, and 2.1±0.96; respectively. The differences between question responses were highly significant as revealed by Friedman's test. Also, the differences between scores within each question were also significant in all questions except Q1 and Q14 as revealed by Chi-square test.

In Reading post-test, the average (±SD) students' scores recorded for reading questions 1, to 15 were 1.7±0.86, 2.0±1.19, 2.8±0.71, 1.5±0.85, 3.0±1.18, 2.4±0.77, 2.4±1.37, 1.9±0.59, 2.4±0.84, 2.2±0.95, 2.7±0.78, 2.6±1.01, 2.6±0.96, 2.3±0.78, and 2.0±0.81; respectively. The differences between question responses were highly significant as revealed by Friedman's test. Moreover, the differences between scores within each question were also significant in all questions except Q1 and Q14 as revealed by Chi-square test. The differences between pre and post responses were significant in question 1, question 3 and question 9 as revealed by Wilcoxon's signed rank.

Table 4 Descriptive statistics of student's Pre-Post Reading Tests showing mean median, mode, SD, percentile, and Chi-square

		Mean	Median	Mode	SD	Percentiles		Chi-Square
						25	75	
Pre	**Q1**	2.2	2.0	1	1.08	1.0	3.0	0.261ns
	Q2	2.3	1.5	1	1.39	1.0	4.0	<.001***
	Q3	1.2	1.0	1	0.68	1.0	1.0	<.001***
	Q4	1.4	1.0	1	0.80	1.0	1.0	<.001***
	Q5	3.5	4.0	4	0.91	3.3	4.0	<.001***
	Q6	2.2	2.0	2	0.61	2.0	2.0	<.001***
	Q7	1.9	1.0	1	1.24	1.0	3.0	<.001***
	Q8	2.0	2.0	2	0.45	2.0	2.0	<.001***
	Q9	2.8	3.0	3	0.76	3.0	3.0	<.001***
	Q10	2.0	2.0	1	1.05	1.0	3.0	0.002**
	Q11	3.0	3.0	3	0.75	3.0	3.0	<.001***
	Q12	2.8	3.0	3	0.84	2.0	3.0	<.001***
	Q13	2.7	3.0	3	0.92	2.0	3.0	0.02*
	Q14	2.3	2.0	3	1.07	1.0	3.0	0.392ns
	Q15	2.1	2.0	1	0.96	1.0	3.0	0.079ns
Post	**Q1**	1.7	1.0	1	0.86	1.0	2.0	<.001***
	Q2	2.0	1.5	1	1.19	1.0	3.0	0.002**
	Q3	2.8	3.0	3	0.71	3.0	3.0	<.001***
	Q4	1.5	1.0	1	0.85	1.0	2.0	<.001***
	Q5	3.0	3.5	4	1.18	2.0	4.0	0.002**
	Q6	2.4	2.0	2	0.77	2.0	3.0	<.001***
	Q7	2.4	2.0	1	1.37	1.0	4.0	0.002**
	Q8	1.9	2.0	2	0.59	2.0	2.0	<.001***
	Q9	2.4	3.0	3	0.84	2.0	3.0	<.001***
	Q10	2.2	2.0	2	0.95	1.0	3.0	0.06**
	Q11	2.7	3.0	3	0.78	2.0	3.0	<.001***
	Q12	2.6	3.0	3	1.01	1.3	3.0	<.001***
	Q13	2.6	3.0	3	0.96	2.0	3.0	0.06**
	Q14	2.3	2.0	2	0.78	2.0	3.0	<.001***
	Q15	2.0	2.0	2	0.81	1.0	2.0	<.001***

Table 5 Descriptive statistics of student's Pre-Post Reading Tests showing mean and SD.

	Pre		Post		Wilcoxon's
	Mean	SD	Mean	SD	
Q1	2.2	1.08	1.7	0.86	0.033 *
Q2	2.3	1.39	2.0	1.19	0.347 ns
Q3	1.2	0.68	2.8	0.71	<.001 ***
Q4	1.4	0.80	1.5	0.85	0.42 ns
Q5	3.5	0.91	3.0	1.18	0.034 *
Q6	2.2	0.61	2.4	0.77	0.226 ns
Q7	1.9	1.24	2.4	1.37	0.14 ns
Q8	2.0	0.45	1.9	0.59	0.817 ns
Q9	2.8	0.76	2.4	0.84	0.043 *
Q10	2.0	1.05	2.2	0.95	0.521 ns
Q11	3.0	0.75	2.7	0.78	0.195 ns
Q12	2.8	0.84	2.6	1.01	0.356 ns
Q13	2.7	0.92	2.6	0.96	0.675 ns
Q14	2.3	1.07	2.3	0.78	0.502 ns
Q15	2.1	0.96	2.0	0.81	0.429 ns
p-value	<0.001***		<0.001***		

Table 6

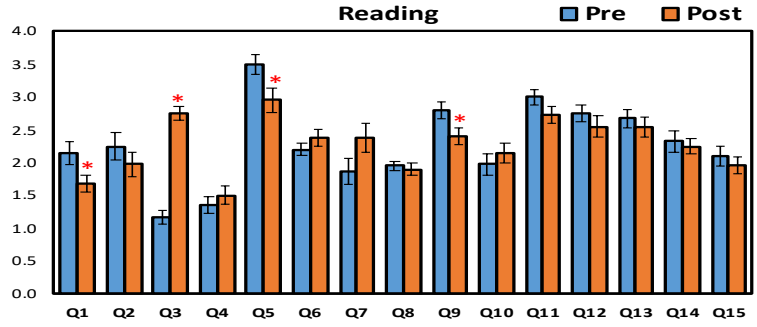

Figure 5 Bar chart presenting the average student's Pre-Post Reading Tests scores. Asterisks denote significant difference between pre and post-tests.

Descriptive statistics of student's Pre-Posts Reading Tests scores presented as frequency n, %.

	Frequency n (%)								Wilcoxon's
	Reading (Pre-)				Reading (Post)				
	a	b	c	d	a	b	c	d	
Q1	14(35.0)	12(30.0)	8(20.0)	6(15.0)	21(52.5)	13(32.5)	4(10.0)	2(5.0)	0.033 *
Q2	20(50.0)	4(10.0)	2(5.0)	14(35.0)	20(50.0)	9(22.5)	3(7.5)	8(20.0)	0.347 ns
Q3	37(92.5)	1(2.5)	0(0.0)	2(5.0)	4(10.0)	4(10.0)	30(75.0)	2(5.0)	<.001 ***
Q4	32(80.0)	4(10.0)	2(5.0)	2(5.0)	27(67.5)	8(20.0)	3(7.5)	2(5.0)	0.42 ns
Q5	1(2.5)	8(20.0)	1(2.5)	30(75.0)	6(15.0)	10(25.0)	4(10.0)	20(50.0)	0.034 *
Q6	1(2.5)	33(82.5)	3(7.5)	3(7.5)	2(5.0)	26(65.0)	7(17.5)	5(12.5)	0.226 ns
Q7	25(62.5)	3(7.5)	4(10.0)	8(20.0)	17(42.5)	6(15.0)	2(5.0)	15(37.5)	0.14 ns
Q8	4(10.0)	35(87.5)	0(0.0)	1(2.5)	9(22.5)	26(65.0)	5(12.5)	0(0.0)	0.817 ns
Q9	4(10.0)	4(10.0)	28(70.0)	4(10.0)	8(20.0)	9(22.5)	22(55.0)	1(2.5)	0.043 *
Q10	19(47.5)	6(15.0)	12(30.0)	3(7.5)	11(27.5)	16(40.0)	9(22.5)	4(10.0)	0.521 ns
Q11	3(7.5)	2(5.0)	27(67.5)	8(20.0)	4(10.0)	7(17.5)	25(62.5)	4(10.0)	0.195 ns
Q12	4(10.0)	8(20.0)	22(55.0)	6(15.0)	10(25.0)	3(7.5)	22(55.0)	5(12.5)	0.356 ns
Q13	5(12.5)	10(25.0)	18(45.0)	7(17.5)	7(17.5)	10(25.0)	17(42.5)	6(15.0)	0.675 ns
Q14	12(30.0)	9(22.5)	13(32.5)	6(15.0)	7(17.5)	17(42.5)	15(37.5)	1(2.5)	0.502 ns
Q15	13(32.5)	13(32.5)	11(27.5)	3(7.5)	12(30.0)	20(50.0)	6(15.0)	2(5.0)	0.429 ns

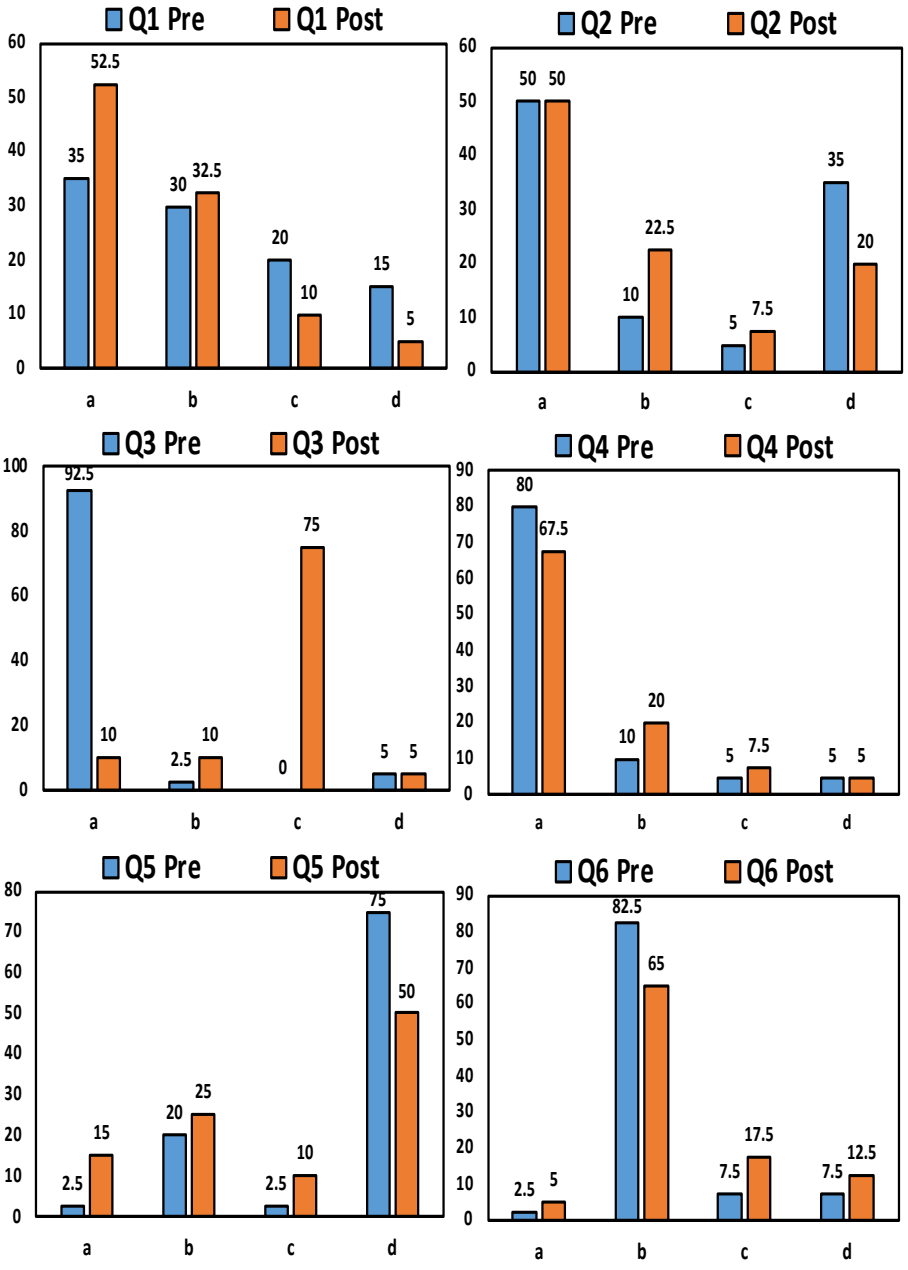

Figure 6 Bar chart presenting the distribution of Student's answers to the Reading Tests both pre and post presented as frequency (%)

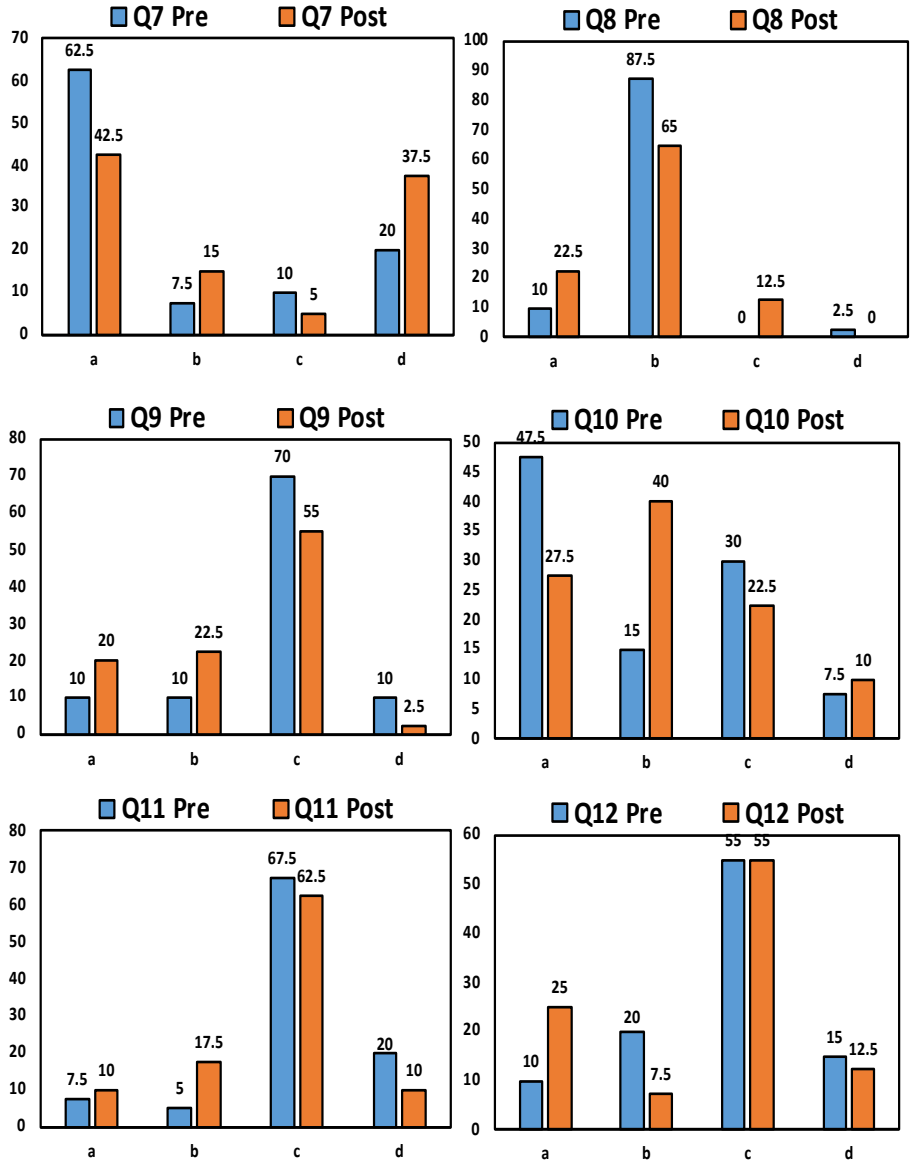

Figure 7 Bar chart presenting the distribution of Student's answers to Reading Tests both pre and post presented as frequency (%).

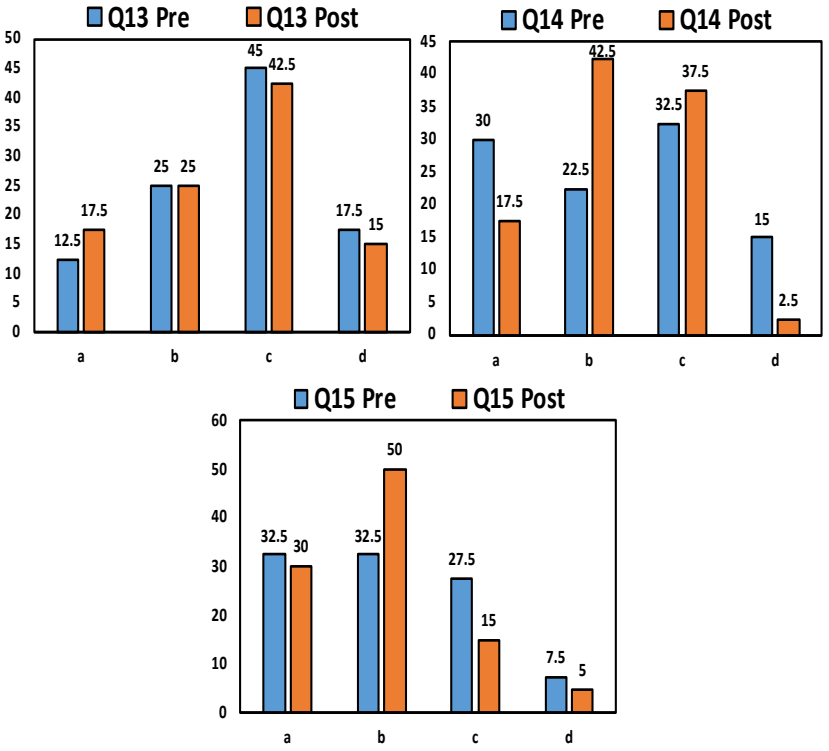

Figure 8 Bar chart presenting the distribution of Student's answers to Reading Tests both pre and post presented as frequency (%).

15.1 Interaction between variables

The relationship between the study variables including pre/post with various skills were presented in table 6 and Figures 6, 7, and 8. There was a positive direct significant correlation between Pre/post reading skills (r=0.29, p<0.001. These interrelationships were revealed also confirmed by heat map presented in Figure (8) in addition to Canonical Correspondence Analysis (CCA) presented in Figure (9) and Correlation matrix in Table (7).

The Canonical Correspondence Analysis (CCA) presented in Figure (8) shows the relationship of all variables and all participants, where participants presented as black points and variables (factors) presented as green arrows (pre/post). The arrow gives the direction of the effect of the

factor if it positive or negative. The two axis CCA-1 and CCA-2 represent a total variance % of 70.87% and 8.99%; respectively. The two PCAs represent a total variance of 79.86% of the study.

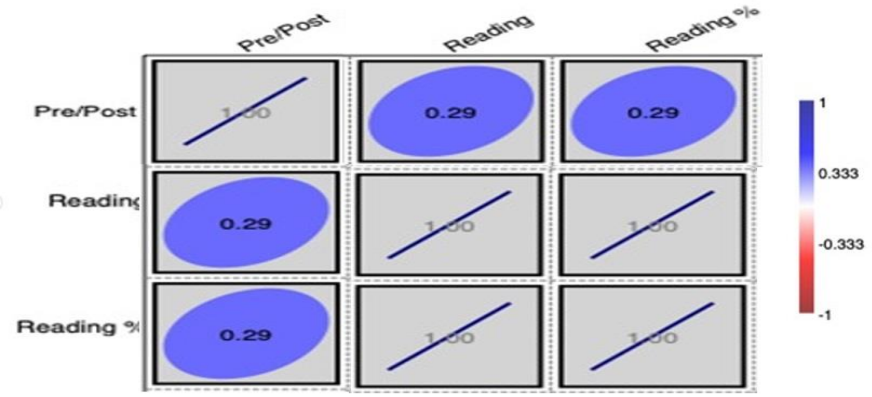

Figure 8 Heat map showing the interaction between pre/post with various including reading skills. Blue color for positive correlation, red color denotes negative correlation, boxed grey color denotes significant correlation.

Table 3 Correlation matrix presenting the interrelationship between the reading skills pre-test and post-test. The lower triangle represents r correlation coefficient, upper right triangle.

Variables	Pre/Post	Reading	Reading %
Pre/Post		0.009**	0.009**
Reading	0.291		<0.001***
Reading %	0.291	1.000	

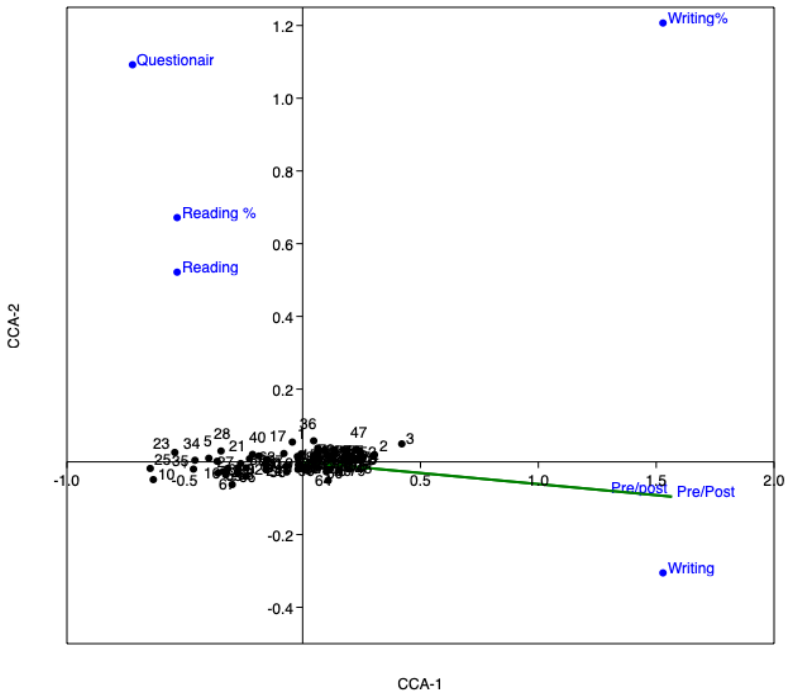

Figure 9 Correlation matrix presenting the interrelationship between study variables including pre/post with various skills related to e-reading skills. The lower triangle represents r correlation coefficient, upper right triangle.

16. Conclusion

Based on the results of the present study, the following conclusions were reached:

- It is stated that the suggested designed programme using digital learning applications developed students‟ performance in English language reading skills.
- The study revealed that using digital learning applications into sets of collaborative activities as reading and comprehension

was successful and helped learners improve their English language E-reading skills.

- The study revealed that implementing digital learning applications and tools in the EFL classrooms provided support for the collaborative production of the shared knowledge, documents, and materials by means of group interaction through online peer reviewing and editing of given texts.
- It is stated that the study showed the importance of English language E-reading skills that students of the preparatory year programme at the College of Tourism and Hospitality should acquire by adopting digital learning applications, websites, and tools within face to face and collaborative groups.
- Providing students with a student's manual helped them do the activities more accurately and foster their schemata in English language.

17. Recommendations

17.1 Recommendations for Teachers

- It is recommended for English language teachers to implement digital learning applications, tools, and platforms in their EFL classes.
- Teachers should be trained in using technology and the related tools while teaching for the benefit of their students.
- Teachers should always encourage the students to use technology and applications that help them foster their English language skills.
- Teachers are recommended to form groups on Smartphones using the WhatsApp application to send instructions to students since the majority attend classes with their devices (Whalen, 2020).

17.2 Recommendations for Students

Students should be given the opportunity to collaborate either face to face or online to do the tasks and give and receive feedback.

Students should be encouraged to use devices such as smartphones and the available applications to practice and improve their English language different skills (Metruk, 2021).

Recommendations for Curriculum Designers

- Implementing technology in general and specifically digital learning applications should be added to the objectives of the different courses students take (Almaiah et al., 2020).
- Course books activities should be redesigned to achieve the new objectives.
- Technical support resources should be provided to guarantee the quality of the implemented applications.
- Syllabus designers should pay attention to the effect of using technology and digital learning applications on raising students' motivation and refreshing their schemata (Janelli, 2018).

17.3Recommendations for Further Research

Due to the limitations of the study there are some recommendations for further research. These recommendations include:

1. Since the sample size was limited to students of Tourism and Hospitality in the Common First Year Programme, the findings may not be applied to similar Preparatory Year Programmes. As a result, future research might be conducted with similar programmes to compare the results.
2. Further research is needed to develop students' English language E-reading skills using the digital learning applications.

3. Further research is needed to investigate the effect of using e-feedback on developing students' skills in summarizing the given texts.
4. Further research is needed to develop students‟ autonomous learning in English language reading classes.
5. Further research is recommended in other colleges to find out more about the impact of implementing digital learning applications in teaching English language other skills.

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