Chapter Four

Results and Discussion

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The aim of this chapter is to present the results of the study, analyze, and discuss these results in the light of the data obtained through the administration of blended learning program that aimed at developing the first secondary stage students' critical reading skills.

Statistical Analysis

Data required at the beginning and at the end of the research were proceeded in Statistical Package of Social Sciences (SPSS) and Excel program. (Ancova) and T-test analysis were used . In the comparison of groups, independent sample t-test was used. In the pretest and posttest comparisons of the experimental group, paired sample t-test was used.

Results

First: The results according to the electronic test on the first 6 skills as (agree/disagreeing with authors and finding alternatives) were in paper-and-pencil

Table (2): Ancova for the Experimental and Control Groups on the Critical Reading Skills Test (the Electronic Form)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16643.723(a)	2	8321.862	25.618	.000
Intercept	7533.850	1	7533.850	23.192	.000
Electronic	2672.162	1	2672.162	8.226	.006
group	2841.132	1	2841.132	8.746	.005
Error	14617.943	45	324.843		
Total	287638.000	48			
Corrected Total	31261.667	47			

Table (2) indicates that there were statistically –significant differences at thelevel of (.01) between the mean scores of the experimental group and the control group in favor of the experimental group on the electronic critical reading skills test in general. The (.01) level of significance indicated a high degree of credibility of results.

In order to analyze the data, administering a paper-and-pencil test was required, the results were as follows:

The main hypothesis

After conducting the program, the data were analyzed statistically using SPSS. It pointed that there were differences between the control group and the experimental group, so (Ancova) was needed and calculated.

Table (3): The significant differences between both groups

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
t1 Equal variances assumed	3.233	.079	-5.113	46	.000	-26.69841	5.22217	-37.21009	-16.18673
Equal variances not assumed			-5.402	44.306	.000	-26.69841	4.94203	-36.65647	-16.74035

Table (3) shows these differences .These differences were for the experimental group.

Dealing with (Ancova) the results were as follows:
For the main hypothesis,

> There was no statistically- significant difference between the mean scores of the experimental group and the control group on the critical reading skills test

(4): Ancova for the Experimental and Control Groups of the Critical Reading Skills Test (the Paper -and -Pencil Form)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	28276.207(a)	2	14138.103	67.388	.000
Intercept	5111.168	1	5111.168	24.362	.000
Paper & pencil Test	7549.061	1	7549.061	35.982	.000
group	5267.043	1	5267.043	25.105	.000
Error	9441.106	45	209.802		
Total	1153102.500	48			
Corrected Total	37717.312	47			

Table (4) indicates that there were statistically –significant differences at the level of (.01) between the mean scores of the experimental group and the control group in favor of the experimental group on the critical reading skills test in general. The (.01) level of significance indicated a high degree of credibility of results.

The main hypothesis of the research was rejected.

The first hypothesis

a. There is no statistically- significant difference between the mean scores of the experimental group and the control group in identifying the main idea and sub-ideas of a text as measured by the critical reading skills test.

In order to verify this hypothesis, (Ancova) analysis was calculated. The aim was to validate the statistical significance of the difference between the experimental and the control groups in the post administration of the critical reading skills test as to the skill of "identifying the main idea and the sub-ideas of the text." Using SPSS, the following tables were submitted:

Table (5): Ancova for the Experimental and Control Groups on The Skill of "Identifying the Main Idea and Sub-Ideas of the Text"

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	156.731[a]	2	78.366	11.098	.000
Intercept	250.832	1	250.832	35.523	.000
The main and sub-ideas	59.945	1	59.945	8.490	.006
Group	33.940	1	33.940	4.807	.034
Error	317.748	45	7.061		
Total	21183.000	48			
Corrected Total	474.479	47			

Table (5) indicates that there were statistically –significant differences at the level of (.05) between the mean scores of the experimental group and the control group in favor of the experimental group on the skill of "identifying the main idea and sub-ideas of the text.". Thus, the first hypothesis of the research would be refuted.

The second hypothesis

b. There is no statistically- significant difference between the mean scores of the experimental group and the control group in constructing the meaning of a given text as measured by the critical reading skills test.

In order to verify this hypothesis, (Ancova) analysis was calculated. The aim was to validate the statistical significance of the difference between the experimental and the control groups in the post administration of the critical reading skills test on the skill of "constructing the meaning of a given text." Using SPSS, the following tables were submitted:

Table (6): Ancova for the Experimental and Control Groups on the Skill of "Constructing the Meaning of a Given Text"

Source	Type III Sum of Squares	df	M.	F	Sig.
Corrected Model	643.940[a]	2	321.970	9.442	.000
Intercept	1973.426	1	1973.426	57.870	.000
Constructing	15.091	1	15.091	.443	.509
Group	497.905	1	497.905	14.601	.000
Error	1534.539	45	34.101		
Total	61751.000	48			
Corrected Total	2178.479	47			

Table (6) indicates that there were statistically –significant differences at the level of (.01) between the mean scores of the experimental group and the control group in favor of the experimental group on the skill of "constructing the meaning based on the text.". Thus, the second hypothesis of the research was rejected.

The third hypothesis

c. There is no statistically- significant difference between the mean scores of the experimental group and the control group in identifying the author's purpose in writing the text as measured by the critical reading skills test.

Table (7): Ancova for the Experimental and Control Groups on the Skill of "Identifying the Author's Purpose of a Text"

Source	Type III Sum of Squares	Df	M.	F	Sig.
Corrected Model	18.877[a]	2	9.439	1.791	.178
Intercept	507.279	1	507.279	96.269	.000
The purpose	2.285	1	2.285	.434	.514
Group	13.334	1	13.334	2.530	.119
Error	237.123	45	5.269		
Total	32704.000	48			
Corrected Total	256.000	47			

Table (7) indicates that there were no statistically –significant differences at the level of (.05) between the mean scores of the experimental group and the control group on the skill of "identifying the author's purpose of a text" .Thus, the third hypothesis of the research would be accepted.

The fourth hypothesis

d. There is no statistically- significant difference between the mean scores of the experimental group and the control group in determining the cause-effect relationship as measured by the critical reading skills test.

In order to verify this hypothesis, (Ancova) analysis was calculated. The aim was to validate the statistical significance of the difference between the experimental and the control groups in the post administration of the critical reading skills test as to the skill of "determining the cause-effect relationship." Using SPSS, the following tables were submitted:

Table (8): Ancova for the Experimental and Control Groups on the Skill of" Determining the Cause-Effect Relationship

Source	Type III Sum of Squares	Df	M.	F	Sig.
Corrected Model	328.943[a]	2	164.471	21.830	.000
Intercept	1557.875	1	1557.875	206.775	.000
Cause-effect	2.868	1	2.868	.381	.540
Group	270.960	1	270.960	35.964	.000
Error	339.036	45	7.534		
Total	25013.000	48			
Corrected Total	667.979	47			

Table (8) indicates that there were statistically –significant differences at the level of (.01) between the mean scores of the experimental group and the control group on the skill of "determining the cause-effect relationship" in favor of the experimental group. Thus, the fourth hypothesis of the research was rejected.

The fifth hypothesis

e. There is no statistically- significant difference between the mean scores of the experimental group and the control group in comparing things or characters as measured by the critical reading skills test.

In order to verify this hypothesis, (Ancova) analysis was calculated. The aim was to validate the statistical significance of the difference between the experimental and the control groups in the post administration of the critical reading skills test as to the skill of "comparing things or characters." Using SPSS, the following tables were submitted:

Table (9): Ancova for the Experimental and Control Groups on the Skill of 'Comparing Things or Characters"

Source	Type III Sum of Squares	Df	M.	F	Sig.
Corrected Model	69.000[a]	2	34.500	8.024	.001
Intercept	304.227	1	304.227	70.758	.000
Comparing	32.331	1	32.331	7.520	.009
Group	4.065	1	4.065	.945	.336
Error	193.479	45	4.300		
Total	9365.000	48			
Corrected Total	262.479	47			

Table (9) indicates that there were no statistically –significant differences at the level of (.05) between the mean scores of the experimental group and the control group on the skill of "comparing things or characters" . Thus, the fifth hypothesis of the research was accepted.

The sixth hypothesis

f. There is no statistically- significant difference between the mean scores of the experimental group and the control group in evaluating the text by using some criteria (clarity, precision, relevance, significance, depth, consistency and fairness) as measured by the critical reading skills test.

In order to verify this hypothesis, (Ancova) analysis was calculated. The aim was to validate the statistical significance of the difference between the experimental and the control groups in the post administration of the critical reading skills test as to the skill of "evaluating the text by using some criteria (clarity, precision, relevance, significance, depth, consistency, and fairness)." Using SPSS, the following tables were submitted:

Table (10) shows the mean and standard deviation for the Experimental and Control Groups on the Skill of "Evaluating Text Based on Some Criteria"

Table (10): Ancova for the Experimental and Control Groups on The Skill of "Evaluating Text Based on Some Criteria"

Source	Type III Sum of Squares	Df	M.	F	Sig.
Corrected Model	232.472[a]	2	116.236	5.141	.010
Intercept	1221.959	1	1221.959	54.045	.000
Evaluating	13.359	1	13.359	.591	.446
Group	202.210	1	202.210	8.943	.005
Error	1017.445	45	22.610		
Total	19114.000	48			
Corrected Total	1249.917	47			

Table (10) indicates that there were statistically –significant differences between the mean scores of the experimental group and the control group at the level of (.01) on the skill of "evaluating the text by using some criteria (clarity, precision, relevance, significance, depth, consistency, and fairness)" in favor of the experimental group .Thus, the sixth hypothesis of the research would be refuted.

The seventh hypothesis

g. There is no statistically- significant difference between the mean scores of the experimental group and the control group in agree/disagreeing with the author as measured by the critical reading skills test.

In order to verify this hypothesis, (Ancova) analysis was calculated. The aim was to validate the statistical significance of the difference between the experimental and the control groups in the post administration of the critical reading skills test as to the skill of "the skill of agree/disagree with the author" . Using SPSS, the following tables were submitted:

Table (11): Ancova for the Experimental and Control Groups on the ”Agree/disagree with the Author”

Source	Type III Sum of Squares	df	M.	F	Sig.
Corrected Model	1767.308(a)	2	883.654	93.003	.000
Intercept	443.647	1	443.647	46.693	.000
Agree/disagree	565.343	1	565.343	59.501	.000
GROUP	543.330	1	543.330	57.184	.000
Error	427.561	45	9.501		
Total	5116.750	48			
corrected	2194.870	47			

Tables (11) indicates that there were statistically –significant differences at (.01) between the mean scores of the experimental group and the control groups on the skill of “agree/disagree with the author “in favor of the experimental group. Thus, the seventh hypothesis of the research was rejected.

The eighth hypothesis

h. There is no statistically- significant difference between the mean scores of the experimental group and the control group in finding alternatives as measured by the critical reading skills test.

In order to verify this hypothesis, (Ancova) analysis was calculated. The aim was to validate the statistical significance of the difference between the experimental and the control groups in the post administration of the critical reading skills test as to the skill of “finding alternatives” Using SPSS, the following tables were submitted:

Table (12): Ancova for the Experimental and Control Groups on the Skill of" Finding Alternatives"

Source	Type III Sum of Squares	df	M.	F	Sig.
Corrected Model	1558.021(a)	2	779.010	63.668	.000
Intercept	340.416	1	340.416	27.822	.000
Finding Alternatives	572.306	1	572.306	46.774	.000
Group	399.374	1	399.374	32.641	.000
Error	550.599	45	12.236		
Total	4495.750	48			
Corrected Total	2108.620	47			

Table (12) indicates that there were statistically –significant differences at (.01) between the mean scores of the experimental group and the control group on favor of the experimental group on the skill of "finding alternatives" .Thus, the 8th hypothesis of the research was rejected.

In order to verify the effect of the program on developing the critical reading skills independent samples t-test for equality of means was calculated. The aim was to validate the statistical significance of the difference between the mean scores of the pretest and posttest of the experimental group .Using SPSS, the following table was submitted

Table (13): Paired Sample T-Test for the Experimental Group on the Pretest /Posttest on the Critical Reading Skills Test

T-Test for the First Six Skills

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		M.	SD.	Std. Error Mean	Lower	Upper			
Pair 1	a1 - a1_21	-2.28571	2.62950	.57380	-3.48265	-1.08878	-3.983	20	.001
Pair 2	a2 - a2_22	-6.76190	5.80435	1.26661	-9.40401	-4.11980	-5.339	20	.000
Pair 3	a3 - a3_23	-1.85714	3.55367	.77547	-3.47475	-.23953	-2.395	20	.027
Pair 4	a4 - a4_24	-4.33333	7.13676	1.55737	-7.58195	-1.08472	-2.782	20	.011
Pair 5	a5 - a5_25	-.76190	2.96487	.64699	-2.11150	.58769	-1.178	20	.253
Pair 6	a6 - a6_26	-7.52381	6.21787	1.35685	-10.35415	-4.69347	-5.545	20	.000

Table (13) indicates the following results**:**

a. There was statistically- significant difference at level (.01) between the mean scores of the pretest and the posttest of the experimental

group in the skill of "identifying the main idea and the sub- ideas of the text "in favor of the posttest.

b. There was statistically- significant difference at level (.01) between the mean scores of the pretest and the posttest of the experimental group in the skill of "constructing the meaning based on the text "in favor of the posttest.
c. There was statistically- significant difference at level (.05) between the mean scores of the pretest and the posttest of the experimental group in the skill of "identifying the purpose of the author of the text "in favor of the posttest.
d. There was statistically- significant difference at level (.01) between the mean scores of the pretest and the posttest of the experimental group in the skill of "determining the cause-effect relationship "in favor of the posttest.
e. There was no statistically- significant difference at level (.05) between the mean scores of the pretest and the posttest of the experimental group in the skill of "comparing ideas or characters."
f. There was statistically- significant difference at level (.01) between the mean scores of the pretest and the posttest of the experimental group in the skill of "evaluating texts based on some criteria "in favor of the posttest.

Table (14): Paired Sample T-Test for the Experimental Group on the Pretest /Posttest on the Skill of "Agree/disagree with the Author":

		Paired Differences					t	df	Sig. (2-tailed)
		M.	SD.	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	A - A2	-5.6667	3.0097	.6568	-7.0367	-4.2967	-8.628	20	.000

g. There was statistically- significant difference at level (.01) between the mean scores of the pretest and the posttest of the experimental group in the skill of "agree/disagree with the author "in favor of the posttest.

Table (15): Paired Sample T-Test for the Experimental Group on the Pretest /Posttest on the Skill of "Finding Alternatives":

		Paired Differences					t	df	Sig. (2-tailed)
		M.	SD.	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	**B - B2**	-4.8095	4.4031	.9608	-6.8138	-2.8053	-5.006	20	.000

h. There was statistically- significant difference at level (.01) between the mean scores of the pretest and the posttest of the experimental group in the skill of "finding alternatives "in favor of the posttest.

Table (16): Paired Sample T-Test for the Experimental Group on the Pretest /Post-Test on the Critical Reading Skills Test "the Total Results"

		Paired Differences					t	df	Sig. (2-tailed)
		M.	SD.	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	T1 - T2	-34.0000	14.0517	3.0663	-40.3963	-27.6037	-11.088	20	.000

There was statistically- significant difference at level (.01) between the mean scores of the pretest and the posttest of the experimental group in favor of the posttest.

The results of the final survey of the reflective inventories indicated that all the students were interested in the course when asked about their opinion of the program and their opinion of the teacher. The questions were as follows:

"If you were in a conversation with a friend, would you recommend taking a course by this teacher? Why? Why not?"

"If you were in a conversation with a friend, would you recommend taking such a course? Why? Why not?"

- 85,7 % of the answers were positive concerning the results of the final reflective inventories when asking about the teacher and the program..

Discussion of Results

As one can see from the results from 2-9 above, experimental group did not perform equally -well in the different critical reading skills measured by the critical reading test (CRT).The level of significance changed from .01 level of significance to .05 level of significance .In 5 of the skills measured, the level of significance was .01 and in 1 of the measured skills ,the level of significance was .05. Moreover, in two of the critical reading skills (identifying the purpose of the author in writing the text) and (comparing things or characters), there was an indication that there would be significant differences in the future; that is attainable only if the intervention was prolonged.

It was noticed that the grades of the control group were high on the post-test. This indicates a very important thing, namely, there is another factor that affected the control group. This is because the researcher observed that the students of the control group were cheating from each other during the post-test. The class consisted of 35 students .They were seated beside each other. The researcher realized that in such MCQ items, it is easy to cheat.

On the other hand, analyzing the results of pre/posttests of the experimental group only indicated that:

a. There was a statistically- significant difference at level (.01) between the mean scores of the pretest and the post-test of the experimental group in favour of the post-test.

b. There was a statistically- significant difference at level (.05) between the mean scores of the pretest and the post-test of the experimental group in the skill of "identifying the main idea and the secondary ideas of the text "in favour of the post-test.

c. There was a statistically- significant difference at level (.01) between the mean scores of the pretest and the post-test of the experimental group in the skill of "constructing meaning based on the text "in favour of the post-test.

d. There was a statistically- significant difference at level (.05) between the mean scores of the pretest and the post-test of the experimental group in the skill of "identifying the purpose of the author in writing the text "in favour of the post-test.

e. There was a statistically- significant difference at level (.05) between the mean scores of the pretest and the post-test of the experimental group in the skill of "determining cause-effect relationship "in favour of the post-test.

f. There was no statistically- significant difference at level (.05) between the mean scores of the pretest and the post-test of the experimental group in the skill of "comparing ideas or characters."

g. There was a statistically- significant difference at level (.01) between the mean scores of the pretest and the post-test of the experimental group in the skill of "evaluating texts based on some criteria "in favour of the post-test.

h. There was a statistically- significant difference at level (.01) between the mean scores of the pretest and the post-test of the experimental group in the skill of "dis/agreeing "in favour of the post-test.

i. There was a statistically- significant difference at level (.01) between the mean scores of the pretest and the post-test of the experimental group in the skill of "finding alternatives "in favour of the post-test.

- It was clear that there were statistically significant differences between the mean scores of the experimental group in the pre test and the post-test except on the skill of "comparing things and characters," because that skill was easy for students to study .They had high marks on it in both pre and post-tests .

- Students' assignments were corrected and given back to the students in order to provide them with the feedback.

- The researcher noticed that most students did their homework and sent opinions using the forum.

- In the classroom, they were actively doing the activities; see Appendix J
(samples of students' production inside the classroom).

- It was noticed that the students were very enthusiastic about the program and communicating online.

- It was noticed that the students who did not like the internet or the computer; began to log in and began to join our group on the facebook.

- During discussion, it was noticed that the students were patient to discuss some issues with each other. Their abilities were getting better throughout the time.

- Blended learning proved effective in developing critical reading skills. This result agrees with all the studies which indicated that it helped develop critical reading skills, e.g. Jane, Alan and Anee (2007), Felicia, ,Jerell, Tracy and David (2005), Liz (2010) and Monica (2011).

- As for answers of the test, the researcher was interested in some answers written by students, and would like to report them as she found that these answers pointed to the developed critical reading skills of the students:

One student wrote as an answer to the following question" Do you agree/disagree with the proverb " Never put off until tomorrow what you can do today"? Why?

> "I prefer not to delay anything because this is comfortable and makes us achieve many jobs"

Another student wrote:

> "I agree with this proverb because the following day there will be more tasks to do"

A third student wrote:

> "Because if I left the homework until tomorrow, maybe I could not do it again perfectly "

One student wrote:

> "Delaying today's things until tomorrow will make you miss your work and forget to do it. The work will be very heavy .Delaying things is a bad habit"

One wrote:

> "I agree with this proverb because if I delayed things I might be lazy and would not do my homework soon; this will not make me clever"

Trying to answer the "Do you prefer to do your jobs early or at night? why?
One student wrote

> "I prefer to do my things early because this will help me do more things in this day"

Another student wrote

> "I think doing jobs at night is better because at night I feel that I am relaxed ,there is no much noise, so I can understand my lessons perfectly"

A third student wrote

> "I prefer to do my homework early because if I did not do it early, I would not do it at night as I will be very lazy or busy so I may not do it at all".

Difficulties Encountered by the Researcher

- In spite of taking a formal permission from the university to enter schools in order to apply the questionnaire, only three out of seven schools allowed the researcher to do that . In order to solve this

problem the researcher tried with many schools until the amount of the questionnaire was enough.

- Some students reported technological problems, such as the problem of bad connection so a lab top and an internet USB were utilized inside the class..

- Designing such programs (web-based programs) demands technical support so the researcher depended on a specialized engineer.

- The problem of the cheating among students at schools needs a lot of effort to eliminate so asking another help from other teachers was needed.

- Conducting and designing an electronic test was a very difficult task so the researcher tried hard and asked many other engineers for a help. Besides, in conducting the test ,cooperation from other teachers was needed.

Conclusions

In conclusion, the use of a blended learning program proved to be effective in terms of improving students' critical reading skills in general.

- 44% of the students who filled in the final reflective survey reported that the course developed their language and enriched their vocabulary.

- 55.6% of the students who filled in the final reflective survey reported that the course taught them how to participate with their cooperative groups. It helped in developing their critical reading.

- At the beginning of the course, students said that they thought the course was not important to them, but later on, they became more convinced of its importance for developing their critical reading skills.

To wrap up, the aim of the present chapter was to present the research findings and discuss them. These results showed that the proposed program proved to be effective in developing secondary stage students' critical

reading skills as measured by the critical reading test. These findings were discussed in the light of the qualitative data obtained from students' reflective inventories and their work online.